THE UNIVERSITY
OF ILLNIOIS
LIBRARY
720.5
ARB
v.29

NOTICE: **Return or renew all Library Materials! The *Minimum* Fee for each Lost Book is $50.00.**

The person charging this material is responsible for its return to the library from which it was withdrawn on or before the **Latest Date** stamped below.

Theft, mutilation, and underlining of books are reasons for disciplinary action and may result in dismissal from the University.
To renew call Telephone Center, 333-8400

UNIVERSITY OF ILLINOIS LIBRARY AT URBANA-CHAMPAIGN

NOV 30 1988

L161—O-1096

1909.

VOLUME
TWENTY-NINE.

JANUARY
—JUNE.

LIBRARY
UNIVERSITY OF ILLINOIS
URBANA

The
BUILDERS' JOURNAL
AND
ARCHITECTURAL ENGINEER

APPEALING TO THOSE ENGAGED IN

THE ART OF BUILDING

It is our aim, our ambition, our aspiration even, to build our Journal worthily and well, not for the hour only, but for future years; for the few men in the forefront of an enduring and a laborious art; for the disciplined ranks of a distinguished profession; for the young men—Architects to be—and for all who love a clustered column or a flying buttress, a traceried window or a Greek frieze; for the man, too, who honestly plumbs a jamb. . . . .

CAXTON HOUSE, WESTMINSTER

720.5
ARB
v.79

CONTENTS.

See also Contractors' Section, Fire-Resisting Construction Section, Concrete and Steel Section.

ABATTOIRS, Public, 53.
Abbey, Selby, Itself Again, 574; Westminster, Memorial to Lord Salisbury, 54.
Aberystwyth, National Library of Wales, 434, 602.
Academic Study, 471.
Additions, The National Gallery, 583.
Address to Students, Mr. Ernest George's, 109.
Adversity and Whitewash, The Sweet Uses of, 535.
Advertisement, The uses of, 226.
Aesthetic Paris, 556.
"All in a Garden Green," 333.
American Architecture: with Special Reference to Work at Washington, 290, 314.
American Institute of Architects, 485.
America's Example, 248.
Ancient Buildings and Modern Architecture, 338.
Ancient Monuments in Wales, The Commission on, 54.
Annual Outing of the Bath Master Builders' Association, 608.
Anomalies of "Walking Time," 225.
Apotheosis of Carving, 288.
"Applications" under the London Building Acts, 3, 31, 209.
Apprenticeship Problem, The, 68; Question, The, A Lesson from France, 598; The Decay of, 21.
Architect and Corporation, 536; The Clerical, 158; The Education of the, 86.
Architects, A New Terror to, 290; Assistants, The Guild of, 2, 6, 172, 199, 201, 341; Charges in the United States, 428, 485; of the Day, No. 1: Messrs. Mewès and Davis, 334, 430.
Architectural Association, 23, 39, 49, 72, 105, 113, 166, 177, 256, 266, 559; Dinner, The, 473; Play, The, A Modern "Morality," 288; Sports, 536; The New President and Vice-presidents of the, 559.
Architectural Competitions: Some Suggested Reforms, 474; Copyright, 472, 493, 578; Furniture, 452; Gardening, 67; Profession of To-Day, The, 157; Skyscrapers, 573; Societies, 39, 69, 105, 233, 261, 295; Stimulus, 107; Treatment of Reinforced Concrete, The, 72; Work of the London County Council, The, 403.
Architecture, American, with Especial Reference to work at Washington, 290, 314; at the Royal Academy, 432; Copyright in, 248; Indian, The Evolution of, 158; Japanese Garden, 457; School, 107; The Dead Hand in, 2; The Grand Manner in, 249; The Press and, 177.
Are Damp Walls Caused by Bad Clay? 524.
Art and Architecture, German, 47; and Parsimony, 574; of the Plasterer, The, 158; The Brutal Truth about, 266.
Arts, Honours and the, 598; The Divorce of the, 471; The Union of the, 535.
At Home, The R.I.B.A. President, 137.

BACK-TO-BACK HOUSES, 333.
Bad By-Law and the Defiant Duke, The, 108.
Bath and Bury, 288; In Defence of Old, 579; Master Builders' Association Annual Outing, 608; The Beauties of, 265.
Beachcroft Reservoir, The, 477.
Beauties of Bath, The, 265.
Bequest, A Sympathetic, 451.
Berkhamsted, House at, 269.
Billiken, 1.
Bill, Sweated Industries, 236; The Building and Engineering Works, 199; Trade Boards, 409, 428, 513.
Birmingham Architectural Association, 575; Clerks of Works and Builders' Foremen's Association, 232, 296, 486, 575.
Blackpool Central Library Competition, 4, 27, 112, 141.
Board of Examiners, The R.I.B.A., 175; of Professional Defence, The, 86.
Books for the Architectural Student, 48; Text, Approved by the Board of Architectural Education, 30.
Borough Polytechnic, Extensions at the, 151; Surveyor as Architect, 200.
Brass Gates for the Maharajah of Mysore, 205.
Brighter Prospects, 175.
British and Foreign Building Trade Labour Conditions, 615; Fire Prevention Committee Dinner, The, 518; School of Architecture in Italy, A, 67; Sculpture of To-day, 337.
Budget and Land Values, The, 471.
Builders and the, 609.
Builders and the Budget, 609; Foremen's Association, Annual Dinner, 64; Liabilities, 227; Notes, 521, 609.
Building Acts, "Applications," under the London, 3, 31, 209; and Engineering Works Bill, The, 199.
Building Exhibition, Olympia, 214; and its Value, Some Notes on the, 342; Notices of the Exhibits at the, 347—400, 418; The Soul of the, 333.
Building, Ideals in, False and True, 270; Industry, The Land Tax and the, 540; Reason in, or the Commonsense Use of Materials, 75, 88; Regulations, The New London, 235.
Building Trade, Employment in the, 610; Factory Inspection and the, 607; Labour Conditions, British and Foreign, 615; Legislation and the, 516.
Buildings, Electricity in, 568; in Progress and Completed, 444, 480, 500, 522, 547, 582, 608.
Bury, Bath and, 288; Secondary School Competition, 24, 27.
By-laws, London, Building, 609.

CANADA'S MESSAGE OF HOPE, 573.
Carpenters' Company, The, 543.
Carpenters' Hall, The, 75, 88, 164, 169, 180, 229, 234, 270, 296, 338, 406, 452.
Carving, The Apotheosis of, 288.
Case for Architectural Copyright, The, 493.
Cathedrals, Toledo, 48; Winchester, 108.
Central Criminal Court, Mural Decoration at, 54.
Chair of Civic Design, The, 265, 271.
Church Building Ethics and Aesthetics, 492; House, Wrexham, New, 321; Pageant, The English, 561.
Churches of St. Paul, The Three, 162; St. Clement Danes, 452.
Civic Design, The Liverpool Chair of, 265, 271.
Clause, The Penalty, 518.
Clerical Architect, The, 158.
Clerks of Works and Builders' Foremen's Association, Birmingham, 232; Association, Incorporated, 257.
Cleveland District, House in the, 230.
Club, The Royal Automobile, Pall Mall, London, 334, 409.
Cologne, Iona, Exeter and, 489.
Colour in Street Architecture, The Function of, 77.
Commercial Aspects of Reinforced Concrete, The, 171, 191.
Commission on Ancient Monuments in Wales, 54.
Commonsense Use of Materials, The, 75, 88.
Comparative Statement showing Rate of Wages, etc., in the Federated Towns, 616.
Competition, Blackpool Central Library, 141; Bury Secondary School, 24; Conditions, 540; Middlesbrough Public Library, 537; National Library of Wales, Aberystwyth, 602.
Competitions: Aberbeeg, Mon., Elementary School, 476; Aberystwyth, National Welsh Library, 434; Barnsley, New Grammar School, 171, 295; Barnsley, New School in Grove Street, 609; Berkshire County Council Offices, Reading, 76, 295, 409, 517; Blackpool Library, 4, 27, 112, 141; Bristol Royal Infirmary, 88; Buildings in North Brittany, 232; Burslem, New Public Buildings, 542; Bury Elementary School, 24, 27; Bury Secondary School, 4; Carnegie Library, New Mills, 76; Chislehurst, Cemetery at, 517; Colchester, Technical Institute, 26; Concerning Competitions, 76; Cornwall County Offices, Truro, 88, 112; Coventry Municipal Buildings, 88; Derby Garden Suburb Cottages, 144; Doncaster Municipal High School, 27; Dumfries and Maxwelltown Fever Hospital, 27; Durham, Offices for the Stanley U.D.C., 88; Elland, Yorkshire, Secondary School, 144, 205, 542; Gateshead Primitive Methodist Church and Schools, 4; Grimsby Town Hall Extension, 270, 476, 517, 556; Guildford, Footbridge over the River Wey, 205; Hamilton, New Academy, 476; Ilkeston New Schools, 76; Leeds, Agricultural Hall, 578; Leeds, Pearl Life Assurance Buildings, 205; Liverpool, Extensions to the Royal Southern Hospital, 407, 477; New Arts Building, 517; Middlesbrough Public Library, 27, 270, 454, 476, 495, 535, 537, 556, 579; Mouel Village, near Stafford, 556; Oswaldtwistle, Blackburn, Laying out Estate at, 171; Palmers' Green Congregational Church, 145; Pavement for Slaughter-houses, 232; Penclawdd, Bethel Independent Chapel, 295; Pontardawe Guardians' Office, 295; Pretoria (S.A.) Post Office, 255; Rhos-on-Sea Congregational Church, 495; Riga, Monument to Peter the Great, 409; Rivelin Valley Village Scheme, Sheffield, 27, 476; Romford Girls' Secondary School, 171; Shrewsbury Secondary Schools, 476; Stanley U.D.C. Offices, Durham, 112, 205; Stoke-on-Trent Town Hall Extensions, 318; Toulon Palais de Justice, 27; Tynemouth Palace, 76; Wales, National Library of, 542; Wales, National Museum of, 517; West Riding School, 205; Whitley Bay Public Shelter, 27; Whittingham Asylum, Preston, 76; Wombridge, Elementary Schools, 454; Wood Green, Public Baths, 609.
Competitions, Architectural, Some Suggested Reforms, 474; Concerning, 21, 76, 573.
Composition of Concrete and Bricks, 23, 49.
Compulsory Conciliation, 597.
Concerning Competitions, 21, 76, 573.
Conciliation and Disaffection, 107.
Conciliation, Compulsory, 597.
Concrete and Bricks, Composition of, 23, 49.
Concrete Institute, 9, 63, 171, 191, 273, 324, 547.
Conditions, Competition, 540.
Construction and Wear of Roads, 318.
Contract Forms, Scandalous, 48.
Contractor and Sub-Contractor, 275.
Contracts, Unfair, 108.
Copyright, Architectural, 472, 578; Question, The, 489; in Architecture, 248.
Corporation, Architect and, 536.
Correspondence: "Khartoum Cathedral," by Robt. Weir Schultz, 4; "Compensation to Workmen," by a Welsh Builder, 5; "Glamorgan County Hall, by Not a Competitor, 5; "The Proposed Guild of Architects' Assistants," by E. J. Dixon and Laurence A. Jarvis, 6; "The Mersey Dock and Harbour Board Offices," by George Wragge, Ltd., 30; "The Proposed Guild of Architects' Assistants," by Leicester, 30; "A Rod of Brickwork," by Harry Hems, 104; "Puzzolana," by T. P., 181; "Echo in Assembly Hall," by John B. Wilson and Son, 204; "The Stability of Walls," by George Hornblower, 204; "The Fair Wages Resolution," by Wm. Middleton, 270; "The Manchester Education Committee and the Architectural Profession," by Arthur S. Brewis, 346; "The Taxation of Land Values," by Moore and Crabtree, 454; "Against Back-to-Back Houses and Block Dwellings," by A Builder, 483; "The Taxation of Land Values," by Alfred C. Houston, A.R.I.B.A., 483; "Bridges of Reinforced Concrete," by James A. Smyth, 495; "The Taxation of Land Values," by "An Onlooker," 495; "R.I.B.A. and Registration," by George Hubbard, 517; "Middlesbrough Library Competition," by X. Y. Z., 540; "Practical Building Construction," by J. P. Allen, 540; "Middlesbrough Library Competition," by A. R. Jemmett, and Russell and Cooper, 556; "Dampness and Efflorescence in Walls," by G. H. G., 557; "Architects, Builders, and the Land Taxes," by Victor D. Horsburgh, 557; "Efflorescence in Walls," by Walter Markham, 578; "Columbia Fir,' by Henry Adams, 578.
Cottage Designs, An Exhibition of, 409.
Council of Fine Arts, A, 137.
Criticism of R.I.B.A. Work submitted for the Institute Prizes and Studentships, 87.
Cutting Prices, 137, 151.

DAMP WALLS CAUSED BY BAD CLAY, Are, 524.
Decay of Apprenticeship, The, 21.
Decorative Ironwork: Its Rise and Progress, 452; Plasterwork, 296.
Defence of Old Bath, In, 579.
Defiant Duke, The Bad By-law and the, 108.
De Gustibus, 427.
Design and Craft in English Woodwork, 234.
Devey, George, and his Work, 256.
Devon and Exeter Architectural Society, 233, 488.
Dinners and Diners, 514.
Dinner, The A.A., 473; The British Fire Prevention Committee, 518; Builders' Foremen's Association, 64; Quantity Surveyor's Annual, 485; The R.I.B.A., 514.
Divorce of the Arts, The, 471.
Duties on Land Values, 555.

EARTHQUAKE-RESISTING CONSTRUCTION, A System of, 577.
Economical Library Construction, 580.
Edinburgh Architectural Association, 486, 499.
Edition de Luxe, Our, 314.
Education of the Architect, The, 86.
Einkuechenhauser, 287.
Electricity in Buildings, 568.
Employers and the House of Lords, 198.
Employment in the Building Trade, 610.
Enemy of Buildings, Smoke, the, 490.
English Church Pageant, The, 561.
Woodwork, Design and Craft in, 234.

ENQUIRIES ANSWERED:
Acoustics, Point in Practical, 294.
Adhesive Bond of Reinforcing Bars, 232.
Analysis to Find CO_2, An, 497.
Appointments, Civil Service and L.C.C., 292.
Architects at Messina, 145.
Architects of Municipal Buildings, and Town Halls, 80.
Assignment of Property, 497.
Assistant to Municipal Body, 435.
Bakers' Oven, Constructing a, 80.
Bankrupt Members of Local Authorities, 260.
Base for Cost-iron Stanchion, 434.
Baths, Medicated, Electric, and Turkish, 484.
Board of Education Examination, 562.
Books on Carpentry, Old, 293; on Land and Estate Agency, 563; on Stresses, Architects', 145; for R.I.B.A., Intermediate Examination, 80; on Factory and Workshop Construction, 484; French Cathedrals, 435; on Illuminating, 28; on Reinforced Construction, 184; on Steel Towers, 497.
Braced Collar-beam Roof, Design for, 78, 206.
Building Contracts, 207.
Building Line, Determination of, 145.
Building Line Question, 55, 483.
By-laws and Sanitation, 183.
Calorifers or Basement Stoves, 184.
"Centrolinead," Use of the, 146.
Cesspool, Construction of a, 259.
Church Roof, Strength of a, 260.
Columbia Fir, 484.
Columns and Struts, Steel, 320.
Columns for Workshops, 320.
Compensation for Compulsory Acquisition, 89.
Compensation, Workmen's, 205.
Compound Girder, Strength of, 90, 320.
Continuing Offence, 497.
Convalescent Homes, 498.
Copper for Roofing, 90.
Corporation Claim to Dedication of Land, 78.
Correction of Stress Diagram, 56.
Cost per cubic foot of Public Buildings, 30.

316327

Cracks in Building, 484.
Crushing and Safe Loads on Reinforced Concrete Beams, 8.
Cylinder, Capacity of, 434.
Dampcourse in Existing Building, Inserting, 28.
Depreciation-Compensation, 435.
Diagonal Truss to Square Roof, 208.
Distemper, Green, 20
Domestic Architecture of the Fifteenth and Sixteenth Centuries, 56.
Domestic Work, Current, 294.
Double-hung Sashes, Arranging, 183.
Drainage of Slaughter-houses, 484.
Duodecimally Divided Slide Rule, 182.
Dwarf Wall, Height of, 145.
Echo in Assembly Hall, 145.
Ellipse of Inertia, 454.
Employment on the Ordnance Survey, 294.
Entasis in Plastering, 435.
Extras, A Question of, 611.
Fall Required in Pipe, 206.
Fees, District Surveyor's, 28.
Finishing Pitch Pine, 55.
Fire Assurance, Points in, 207.
Fireplace Openings, 563.
"Flatting," Meaning of Term, 611.
Floor, Decaying, Cause of, 206.
Floors for Dancing, 436, 523.
Footings and the Boundary Line, 611.
Foundation to Walls, 259.
French Polishing, 497.
Frontage Line Question, 182.
Fungus Growth on Floor, 260.
Glass Furnaces, 184.
Green Paints Fading, 497.
Header Arches, Construction of, 564.
Height of Wall, Reckoning, 55.
Insurance of Buildings in Course of Construction, 611.
Joists to Carry Angle Bay and Turret, 497
Lantern Slides of Mediæval Architecture, 29.
Lead, Cast v. Milled, 435.
Lead Work on Turret, Details of, 29.
Lessees' Liabilities, 146
Liability for Defective Drainage, 89.
Liability for Quantity Surveyors' Fees, 183.
Liability of Sub-contractors, 80.
Local Authority and Sewering, 523.
Loss of Light, 436.
Louvres, Continuous, and Gear for Working Them, 293.

Main Timbers, What are, 145.
Measuring Masonry and Brickwork, 484.
Models for Honours Carpentry and Joinery, 55,90.
"Notice to Treat" under the Housing of the Working Classes Act, 29.
Paint, Questions on, 523.
Partnership Question: Style of Firm, 319.
Partnerships, 436.
Party Wall, 523.
Party Wall, Use of, 484.
Pavement for Slaughterhouse, 145.
Platform for Drilling and Gymnastics, 293.
Pointing in Chimney Shaft, 146.
Pressure in Water Main, 206.
Price of Timber Scantlings, Ascertaining, 294.
Procedure for Church Committee, 207.
Property in Old Material, 184, 260.
Protecting Underside of Floor Exposed to Steam, 484.
Public Works Department, 436.
Quantities, Stonework, 184.
Reinforced Concrete, 435.
Rejection of Materials, 563.
Rejection of Plans, Local Authority's 205.
Removing Stains from Pavement: Cleaning Closet Trap, 293.
Repairing Portland Stone-Work, 562.
Reservoir Wall, 206.
Reservoir Wall, Stability of, 294.
Responsibility for Drainage Repairs, 523.
Responsibility for Fallen Fence, 56.
Responsibility for House Drains, 145.
Retaining Wall, Rubble Stone Boundary, 184.
Rights of Adjoining Owners, 319, 497, 611.
Rights of Lessee, 172.
Right of Light, 206, 293.
Roller Skating Rink, Floor for, 29, 80.
Roofs, Steel, 435.
Roof Truss, Proposed, 259.
Roof Truss, Weakness in, 523.
Royal Academy Schools, 435.
R.I.B.A. Examination Questions, 55.
Sea Sand for Concrete, 232, 435.
Selling Presumed Quarrying Field, 172.
Sewage Powers, 293.
Sewage Purification Works for a Small Town, 318.
Shingle and Seasand for Concrete, 172.
Sichel Size, 183.
Sick Benefit Society, Draughtsmen's, 8.
Sign on Drawings, 436.
Silent W.C. Wanted, 145.
Sketching Tour in Derbyshire, Cheshire, or Shropshire, 498.
Sliding Doors, 89.
Smoky Chimney, 55, 80, 89.
Stamping Agreements, 484.
Steel Columns and Struts, 145.
Strength of Floor, 293.
Stress Diagram for Open Timber Roof Truss, 454.
Stresses for Barley Bins, Ascertaining, 28.
Stresses in Roof Trusses, Ascertaining, 30.
Stresses in Walls, 456.
Sunday School, Designing a, 259.
Surveying Plots of Land, 563.
Tenants' Fixtures, 435.
Timber Cantilever, 56.
Tithe Rent Charge on Building Land, 183.
Trade Unionism, Aspects of, 30.
Use of Terms, Fir and Deal, 483.
Validity of Conditions of Land Purchase, 562.
Valuer, County Council, 80.
Walls for Swimming Pond, 79.
Wash-houses or Laundries, 455.
Water Discoloured with Iron, 319.
Water Syphon, 456.
West Walton Church, 435.
Width of Timber for Curved Braces, 206.
York, Beverley, and Howden, 498.
Ethics and Aesthetics, Church Building, 492.
Euclid, Exit, 314.
Exchanges, Labour, 513.
Exeter, and Cologne, Iona, 489.
Exhibition of Cottage Designs, An, 409.
Exhibitions, Housing, 176.
Exit Euclid, 314.
Extensions at the Borough Polytechnic, 151.
External Leadwork, 406.

FACTORY INSPECTION AND THE BUILDING TRADE, 607.
Fair Wages Clause, Government, 199, 227.
Feasts of Reason, 85.
Federation News, 20, 37, 65, 84, 106, 154, 173, 197, 264, 285, 331, 425, 469, 511, 554, 570, 594. Topics, 225; Who's Who, The, 302.
Finchley Garden Village, 212.
Fine Arts, A Council of, 137.
Fire at Messrs. W. N. Troy's, 570.
Form of Contract, The R.I.B.A., 574.
Froy's, Messrs. W. N., Fire at, 570.
Function of Colour in Street Architecture, The, 77.
Furniture, Architectural, 452.
Gardening, Architectural, 67.
Garden of London, The, 401; Village, Finchley, 212.
Gates, Brass, for the Maharajah of Mysore, 205; Royal, The Marble Arch, 176.
Gateshead, St. George's Parochial Hall and Buildings, 560.
General Powers Bill, London County Council, 269.
George Devey and his Work, 256.
George's, Mr. Ernest, Address to Students, 109.
German Art and Architecture, 47; Town Planning, 481.
Glasgow Institute of Architects, 39, 105.
Glorified Glasshouse, The, 228.
Gloucestershire Architectural Association, 261, 296, 486, 543.
Gothic, The Prepotency of, 574.
Government Fair Wages Clause, 199, 227.
Grand Manner in Architecture, The, 157, 249.
Granite and Joinery, Imported, 284; Contracts, Rosyth, 216.
Growth of Design in Woodwork, 164.
Guild of Architects' Assistants, The, 2, 6, 172, 199, 201, 341.

HAGUE PEACE PALACE GARDENS, Planning the, 87.
Hampstead, Small House and Studio near North End Road, 568.
Hardy, Mr. Thomas, 402.
Harrismith, Natal, the Town Hall, 113.
Healthy Dwellings, London's, 536; how They Tell, 597.
Hoarding and Fencing Case, 225.
Homes, Our, 401.
Honours and the Arts, 598.
Horse Guards' Parade, The, 247, 346.
Hospital Extension Competition, Royal Southern (Liverpool), 407.
St. Bartholomew's, London, The New Pathological Block, 562.
House and Studio, Small, near North End Road, Hampstead, 568.
House at Berkhamsted, 269; at New Malden, Surrey, 181; at Paulerspury, Northants, 567; in the Cleveland District, 230; of Lords, Employers and the, 198.
Houses, Back-to-Back, 333.
Housing Exhibitions, 176.
Housing the Londoner, 85.
How Healthy Dwellings Tell, 597.

IDEALS IN BUILDING, False and True, 270.
Ideas in Things, 229.
Imported Granite and Joinery, 284.
Incorporated Church Building Society, 492.
Clerks of Works Association, 257.
Indian Architecture, The, Evolution of, 158; Museum, Suggested, 451.
Influence of Material on Woodwork Design, 169; of Tools on Woodwork Design, The, 180.
In Parliament, 18, 246, 271, 453, 477.
Institute of Builders, 296.
Institution of Gas Engineers, 575; of Municipal Engineers, 486.
Iona, Exeter, and Cologne, 489.
Ironwork, Decorative, Its Rise and Progress, 452.

JACK FROST, Legislation for, 2.
Japanese Garden Architecture, 457.
"Jolligists'" Jubilee, A, 138.
Junior Institute of Engineers, 543.

LABELS AND LAMP-POSTS, 227.
Labour Exchanges, 513.
Lamp-posts, Labels and, 227.
Land Tax and the Building Industry, The, 540.
Land Values, Duties on, 555; The Budget and, 471; The Taxation of, 439.
Law Cases: Plasterers' Union Case on Appeal, 7; A Quantity Surveyors' Claim, 36; Crucifix on Roof Loft—Question of Legality, 52; Storage Reservoir, a Building, 104; Disputed Ownership of Slates: Difference between English and Scottish Law, 172; Locating a Leaking Pipe: Water Board Recovers Cost of Excavating and Reinstating, 216; Hoarding and Fencing Case, 225; Architects' Liability for Materials Ordered, 233; Borough Surveyor's Death from Septic Poisoning: No Compensation, 233; A Falling Wall: Damages Against Contractor, 234; Ferro-Concrete Piles: Patent Rights Appeal, 270.
Lay and Technical Press, The, 175.
Leaderettes: Billiken, 1; Hope for Rome, 1; The Dead Hand in Architecture, 2; Legislation for Jack Frost, 2; "Slushfulness," 2; A Guild of Assistants, 2; Red Ruin and a Moral, 2; Concerning Competitions, 21; The Decay of Apprenticeship, 21; Pap with a Hatchet, 22; The Royal Gold Medal, 22; Recreation and Education, 22; "Out of Print," 22; German Art and Architecture, 47; The Shakespeare Memorial Theatre, 47; Toledo Cathedral, 48; Scandalous Contract Forms, 48; Books for the Architectural Student, 48; Perturbed Paris, 48; A British School of Architecture in Italy, 67; Psychological Phenomena, 67; Architectural Gardening, 67; Leeds Workhouse Extension—A Knotty Question, 68; The Apprenticeship Problem, 68; Visionary London, 85; Housing the Londoner, 85; Feasts of Reason, 85; School Architecture, 107; Conciliation and Disaffection, 107; Architectural Stimulus, 107; The Bad By-law and the Defiant Duke, 108; Winchester Cathedral, 108; Unfair Contracts, 108; The R.I.B.A. President at Home, 137; A Council of Fine Arts, 137; Cutting Prices, 137; A "Jolligists'" Jubilee, 138; The L.G.B. Report, 138; Pulex Irritans, 138; The Grand Manner, 157; The Architectural Profession of To-day, 157; Town Planning, 157; The Evolution of Indian Architecture, 158; The Art of the Plasterer, 158; The Clerical Architect, 158; No More Workhouses, 158; The R.I.B.A. Board of Examiners, 175; The Press, Lay, and Technical, 175; Brighter Prospects, 175; Housing Exhibitions, 176; Sanitation, 176; Government Fair Wages Clause, 199; The Building and Engineering Works Bill, 199; The Guild of Architects' Assistants, 199; Porosity and Paradox, 200; Borough Surveyor as Architect, 200; Fair Wages Clause in Government Contracts, 227; Builders' Liabilities, 227; Soot and Suggestion, 227; Labels and Lamp-posts, 227; "The Glorified Glasshouse," 228; Over-Elaboration, 228; The Horse Guards' Parade, 247; Selfridge's, 247; America's Example, 248; Copyright in Architecture, 248; The Beauties of Bath, 265; An English Chair of Civic Design, 265; Lovely in their Lives, 265; The Brutal Truth About Art, 266; The National Theatre, 287; "Mad on Flat Roofs," 287; Einkuechenhauser, 287; Apotheosis of Carving, 288; Parliament and Town Planning, 313; The Prince's Practical Wisdom, 313; Exit Euclid, 314; Our Exhibition Number, 333; The Soul of the Exhibition, 333; "All in a Garden Green," 333; Back-to-Back Houses, 333; Town Planning, 334; Street Statuary, 334; The Garden of London, 401; Our Homes, 401; The Return of the Native, 402; The Wellington Monument, 427; "Let Glasgow Flourish," 427; De Gustibus, 427; The Trade Boards Bill, 428; Architects' Charges in the United States, 428; R.I.B.A.—Report of the Council, 451; A Sympathetic Bequest, 451; Suggested Indian Museum, 451; St. Clement Danes, 452; Registration and the R.I.B.A., Election, 471; The Divorce of the Arts, 471; Academic Study, 471; The Budget and Land Value, 471; Architectural Copyright, 472; Playing at Town Planning, 489; The Smoke Nuisance, 489; The Copyright Question, 489; Iona, Exeter, and Cologne, 489; L.C.C. School of Architecture, 490; A Triple Alliance, 490; Reinforcement of the R.I.B.A., 513; The Trade Boards Bill, 513; The Victoria Monument and Some Others, 513; Labour Exchanges, 513; Dinners and Diners, 514; The National Pantheon, 514; The Middlesbrough Competition, 535; The Union of the Arts, 535; The Sweet Uses of Adversity and Whitewash, 535; Architect and Corporation, 536; London's Healthy Dwellings, 536; Duties on Land Values, 555; A Root Principle, 555; Aesthetic Paris, 556; Concerning Competitions, 573; Architectural Skyscrapers, 573; Canada's Message of Hope, 573; Selby Itself Again, 574; Art and Parsimony, 574; The Prepotency of Gothic, 574; Compulsory Conciliation, 597; "That Vile Wall" (Shakespeare), 597; How Healthy Dwellings Tell, 597; Legislation is Vexation, 598; Honours and the Arts, 598; Shams, 598.
Leadwork, External, 406.
Leeds and Yorkshire Architectural Society, 105, 543; Workhouse Extension: A Knotty Question, 68.
Legislation and the Building Trade, 516; is Vexation, 598.
Lesson from France, A, The Apprenticeship Question, 598; from the Past, A, 266.
"Let Glasgow Flourish," 427.
Liabilities, Builders', 227.
Library Construction, Economical, 580.
Liverpool Architectural Society, 162, 261, 295, 474, 486, 499; Chair of Civic Design, 265, 271; Engineering Society, 39.
Lloyd's Avenue, E.C., New Offices, No. 1, 499.
L.G.B. Enquiries, 173; Report, The, 138.
London Building Acts, "Applications" under the, 3; Building By-laws, 609; Building Regulations, The New, 235; Buildings, Proposed, 92; Master Builders' Association, 181; The Garden of, 401; Visionary, 85.
London County Council, The, 328; General Powers Bill, 269; School of Architecture, 490; Architectural Work of the, 403.
London's Healthy Dwellings, 536.
Lord Salisbury, Abbey Memorial to, 54.
Lovely in their Lives, 265.

MANCHESTER SCHOOL OF ARCHITECTURE, 70; Manchester Society of Architects, 543.
Marble Arch Royal Gates, The, 176.
Master Builders' Association, London, 181; of New South Wales, The, 312, 332.
Materials, The Commonsense use of, 75, 88.
Matters of Opinion, 36, 83, 439.
Medal, The Royal Gold, 22.
Mewès and Davis, Messrs., No. 1 of Architects of the Day Series, 334, 430.
Memorial, The Queen Victoria, 516.
Message of Hope, Canada's, 573.

Middlesbrough Public Library Competition, 27, 270, 454, 476, 495, 535, 537, 556, 579.
Modern Architecture, Ancient Buildings and, 338.
Monument, The Wellington, 427.
Municipal Works, New, 272.
Mural Decoration at the Central Criminal Court, 54.
Museum, Suggested Indian, 451; The Victoria and Albert, 599.

NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS OF GREAT BRITAIN AND IRELAND, 41, 121, 129, 219, 305, 445, 529, 612.
National Gallery Additions, The, 583; Library of Wales, Aberystwyth, 434, 602; Pantheon, The, 514; Theatre, The, 47, 287.
Newcastle-upon-Tyne and District Clerk of Works and Builders' Foremen Association, 39.
New Malden, Surrey, House at, 181.
New Municipal Works, 272.
New South Wales, The Master Builders' Association of, 312, 332.
Northampton Architectural Excursions Club, 486.
Northern Architectural Association, 232, 488.
Notes and News, 6, 24, 52, 103, 228, 263, 591.
Notes on Competitions, 4, 26, 52, 76, 88, 112, 144, 171, 180, 205, 230, 255, 270, 295, 318, 340, 409, 434, 454, 476, 495, 517, 542, 556, 578, 609; on Painting and Decoration, 116, 298, 520; on the Exhibition and its Value, Some, 342.
Notices of the Exhibits at the Building Exhibition, 347—400.

OBITUARY: William Milner Fawcett, 4; Edward Augustus Gruning, 4; Robert Henry Boyce, 104; Walter Hill, 104; James Brotchie Peace, 181; Cole Alfred Adams, 215; R. A. Nicholson, 215; Alfred Normand, 261.
Offices, No. 1, Lloyd's Avenue, E.C., New, 499.
Open Spaces, Town Planning and, 318.
Our Edition de Luxe, 314; Homes, 401; Plate, 4, 24, 54, 70, 87, 112, 140, 173, 181, 205, 230, 255, 272, 290, 321, 409, 454, 480, 493, 520, 542, 564, 582.
"Out of Print," 22.
Over-Elaboration, 228.
Paint and Varnish Society, 301, 526.

PAINTING AND DECORATION, Notes on, 116, 298, 520.
Pantheon, The National, 514.
Papers Read: "Composition of Concrete and Bricks," by H. D. Searles-Wood, 23, 49; "Public Abattoirs," by Stephen Ayling, 53; "The Architectural Treatment of Reinforced Concrete," by John H. Markham, 72; "The Stability of Walls," by Henry Adams, 81, 90, 127; ".Address to Students," by Ernest George, 109; "Planning of Schools," by H. T. Buckland, 113, 139, 166; "Town and Country: Some Aspects of Town Planning," by H. V. Lanchester, 160; "The Three Churches of St. Paul," by Mervyn E. Macartney, 162; "The Commercial Aspect of Reinforced Concrete," by Lucien Serraillier, 171, 191; "The Press and Architecture," by A. Needham Wilson, 177; "A New Test for Concrete," by J. S. Owens, B.A., M.D., 244; "George Devey and his Work," by James Williams, "A Lesson from the Past," by J. A. Marshall, 266; "Ideals in Building—False and True," by M. H. Baillie-Scott, 270; "American Architecture, with especial Reference to Work at Washington," by Francis S. Swales, 290, 314; "Plasterwork," by Laurence Turner, 296; "Timbers of Commerce: Their Present and Possible Future Supply," by H. J. Elwes, F.R.S., 304; "Paint and its Application to Structural Steel," by Gaston Depierres, 301, 526; The Specification and Inspection of Timber," by J. Davies, 321, 459; "The Corrosion of Steel in Reinforced Concrete," by Ernest R. Matthews, A.M.Inst.C.E., F.R.S.E., 326; "British Sculpture of To-day," by M. H. Spielman, F.S.A., 337; "Ancient Buildings and Modern Architecture," by Thackeray Turner, F.S.A., 338; "The Architectural Work of the London County Council," by W. E. Riley, F.R.I.B.A., 403; "External Leadwork," by F. W. Troup, F.R.I.B.A., 406; "The Dangers of Breeze Concrete," by D. B. Butler, A.M.Inst.C.E., F.C.S., 412, 550; "Architectural Furniture," by Charles Spooner, 452; "Decorative Ironwork: Its Rise and Progress," by Starkie Gardner, 452; "Reinforced Concrete Construction: Design, Quantities and Practice," by Moritz Kahn," 461, 543; "Architectural Competitions: Some Suggested Reforms," by T. Faulkner Shepheard, 474; "Secondary Schools: Their Planning and Equipment," by G. Topham Forrest, M.S.A., 478; "Smoke—The Enemy of Building," by Sir W. B. Richmond, K.C.B., R.A., 490; "Church Building Ethics and Aesthetics," by Edward Warren, F.S.A., 492; "The Setting of Portland Cement," by H. K. G. Bamber, 547.
Pap with a Hatchet, 22.
Paradox, Porosity and, 200.
Paris, Aesthetic, 556; Perturbed, 48.
Parliament and Town Planning, 313.
Parochial Hall and Buildings, Gateshead, St. George's, 560.
Parsimony, Art and, 574.
Past, A Lesson from the, 266.
Pathological Block, St. Bartholomew's Hospital, London, New, 562.
Paulerspury, Northants, House at, 567.
Penalty Clause, The, 518.
Perturbed Paris, 48.
Planimeter, A Simple, 566.
Planning and Equipment of Secondary Schools, 478; of Schools, 113, 139, 166; the Hague Peace Palace Gardens, 87; Town, 157, 334.
Plans, A New Theory of, 481.
Plasterer, The Art of the, 158.
Plasterwork, Decorative, 296.
Playing at Town Planning, 489.
Play, The A.A., A Modern "Morality," 288.
Point in Town Planning, A, 534.
Porosity and Paradox, 200.
Prepotency of Gothic, The, 574.
President and Vice-Presidents of The Architectural Association, The New, 559.
Press and Architecture, The, 177; Lay and Technical, The, 175.
Prices, Cutting, 137.
Prince's Practical Wisdom, The, 313.
Principle, A Root, 555.
Prizes and Studentship Awards (R.I.B.A.), 53, 68.
Professional Defence, The Board of, 86.
Proposed London Buildings, 92, 230, 443; New Works, 37, 51, 70, 92, 120, 153, 170, 198, 212, 255, 346, 500, 522, 583.
Psychological Phenomena, 67.
Public Abattoirs, 53.
Pulex Irritans, 138.
Pulpits, Four Readers' 576.

QUANTITY SURVEYORS' ASSOCIATION, 543; Annual Dinner, 485.
Queen Victoria Memorial, The, 516.

RATE OF WAGES, etc., in the Federated Towns, Comparative Statement showing, 616.
Readers' Pulpits, Four, 576.
Reason in Building: or the Commonsense use of Materials, 88.
Recreation and Education, 22.
Red Ruin, and a Moral, 2.
Registration and the R.I.B.A. Election, 471.
Reinforced Concrete, The Architectural Treatment of, 72; The Commercial Aspects of, 171, 191.
Reinforcement of the R.I.B.A., 513.
Report of the R.I.B.A. Council, 451.
Reservoir, The Beachcroft, 477.
Return of the Native, The, 402.
Roads, Construction and Wear of, 318.
Rome, Hope for, 1.
Root Principle, A, 555.
Rosyth Granite Contracts, 216.
Royal Academy, Architecture at the, 432; Exhibition, 1909, 200, 228, 248.
Royal Automobile Club, Pall Mall, London, The, 334, 409; Gold Medal, The, 22.
R.I.B.A., 39, 53, 68, 69, 87, 109, 160, 232, 290, 337, 341, 403, 417, 451, 454, 490, 542, 561, 574; Board of Examiners, 175; Dinner, The, 514; Election, Registration and the, 471; Examinations, 463; Form of Contract, The, 574; President at Home, 137; Prizes and Studentships, Criticism of Work submitted, 87; Reinforcement of the, 513; Supplemental Charter, 472.
Royal Southern Hospital (Liverpool) Extension Competition, 407.

ST. BARTHOLOMEW'S HOSPITAL, London, The New Pathological Block, 562.
St. Clement Danes, 452.
St. George's Parochial Hall and Buildings, Gateshead, 560.
St. Luke's Vicarage, Hornsey, 519.
St. Paul, The Three Churches of, 162.
Sanitation, 176.
School Architecture, 107; of Architecture, L.C.C., 490; of Engineering, Giza, Vacancy for Assistant-Lecturer, 575.
Schools, Planning of, 113, 139, 166.
Sculpture of To-day, British, 337.
Secondary Schools: Their Planning and Equipment, 478.
Selby Itself Again, 574.
Selfridge Store, Oxford Street, The, 247, 495.
Shakespeare Memorial Theatre, The, 47.
Shams, 598.
Sheffield Society of Architects, 105, 486.
Simple Planimeter, A, 566.
Skyscrapers, Architectural, 573.
"Slushfulness," 2.
Smoke Nuisance, The, 489.
Smoke—The Enemy of Buildings, 490.
Societies' Reports, 486, 499, 542, 575
Society of Architects, 81, 90, 233, 321, 412, 428, 472, 478, 499, 550, 599. Travelling Studentship, The (1909, 565; of Engineers, 326.
Soot and Suggestion, 227.
Soul of the Exhibition, The, 333.
Sources of Supply, Timbers of Commerce, 304.
Specification and Inspection of Timber, The, 321, 459.
Sports, The A.A., 536.
Stability of Walls, The, 81, 90, 127.
Statuary, Street, 334.
Stimulus, Architectural, 107.
Street Architecture, The Function of Colour in, 77; Statuary, 334.
Study, Academic, 471.
Suburban Stations and Town Planning, 561.
Supplemental Charter, R.I.B.A., 472.
Surveyor as Architect, Borough, 200.
Surveyors' Institution, 486.
Sweated Industries Bill, 236.
Sweet Uses of Adversity and Whitewash, The, 535.
Sympathetic Bequest, A, 451.
System of Earthquake-Resisting Construction, A, 577.

TAXATION OF LAND VALUES, The, 439.
Terror to Architects, A New, 290.
Text Books approved by the Board of Architectural Education, 30.
"That Vile Wall" (Shakespeare), 597.
Theatre, The Shakespeare Memorial, 47, 287.
Theory of Plans, A New, 481.
Things, Ideas in, 229.
Timbers of Commerce: Sources of Supply, 304.
Timber, The Specification and Inspection of, 321, 459.
Toledo Cathedral, 48.
Town and Country: Some Aspects of Town Planning, 160.
Town Hall, Harrismith, Natal, 113.
Town Planning, 157, 334; A Point in, 534; and Open Spaces, 318; German, 481; Parliament and, 313; Playing at, 489; Some Aspects of, 160; Suburban Stations and, 561.
Trade and Craft, 20, 39, 66, 83, 106, 128, 156, 172, 198, 217, 246, 312, 332, 410, 444, 470, 567, 611.
Trade Boards Bill, 409, 428, 513.
Travelling Studentship, The Society of Architects', 565.
Triple Alliance, A, 490.
Truth about Art, The Brutal, 266.

UNFAIR CONTRACTS, 108.
Union of the Arts, The, 535.
United States, Architects' Charges in the, 428, 485.
Uses of Advertisement, The, 226.

VACANCY FOR ASSISTANT LECTURER, School of Engineering, Giza, 575.
Vicarage, Hornsey, St. Luke's, 519.
Victoria and Albert Museum, 599.
Victoria Monument and Some Others, The, 513.
Views and Reviews: "Domestic Architecture in Scotland," 8; "Memorials of Old Essex," 37; "The Theory and Practice of Bridge Construction," 37; Calendars, Year Books, and Diaries, 105; "The Everyday Uses of Portland Cement," 217; "The Art of the Plasterer," 261; "Popular Electricity," 263; "Handbook for the Use of the Slide-Rule," 263; "The Blessed Jeanne d'Arc, Maid of Orleans," 432; "Practical Building Construction," 432; "Lightning and the Churches," 458; "Fonts and Font Covers, 458; "An Octaval System of Counting," 459; "Ruined and Deserted Churches," 476; "Marble and Marble Working," 567; "The Architecture of the Renaissance in Italy," 596.
Visionary London, 85.

"WALKING TIME," The Anomalies of, 225.
Walls, The Stability of, 81.
Wellington Monument, The, 427.
Willoughby v. Technical Journals (1902), Limited, 402, 434.
Winchester Cathedral, 108.
Woodwork Design, Influence of Material on, 169; The Influence of Tools on, 180.
Woodwork, English, Design and Craft in, 234; Growth of Design in, 164.
Workhouse Extension, Leeds—A Knotty Question, 68.
Workhouses, No More, 158.
Works in Progress and Completed, 8, 38, 63, 71, 92, 153, 170.
Wrexham, New Church House, 321.

CONTENTS, CONTRACTORS' SECTION.

"APPLICATIONS" UNDER THE LONDON BUILDING ACTS, 3, 31, 209.
Are Damp Walls Caused by Bad Clay? 524.
Ascertaining the Value of Fire Bricks and Blocks, 298.

BIRMINGHAM CLERKS OF WORKS AND BUILDERS' FOREMEN'S ASSOCIATION, 119.
Brick and Tile Trades, The, 32.
Bricks and Brickwork, Notes on, 214
Builders' Notes, 442.
Buildings in Mombasa, 120.

COMPENSATION DECISIONS, Some Recent, 118
Decay of Apprenticeship, The, 115
Dry Rot and Legal Liability, 437

EMPLOYERS' INSURANCE, 442

FAIR WAGES CLAUSE IN GOVERNMENT CONTRACTS, 211

HOW TO FELL A TALL CHIMNEY, 33

MATTERS OF OPINION, 36, 439
Mortice Lock, A New, 529

NOTES ON PAINTING AND DECORATING, 116, 298, 520

PAINT AND ITS APPLICATION TO STRUCTURAL STEEL, 301, 526
Painting and Decoration, Notes on, 298
Pros and Cons of the Inter-trading Rule, Some, 297

ROSYTH GRANITE CONTRACTS, 216

SCAFFOLD, a Portable, Belgian Style, 442
Scaffolding and Appliances at the Building Exhibition, 438
Scaffolding in Brussels, 525
Sub-Contract Form, A New, 525

TAXATION OF LAND VALUES AND ITS EFFECT UPON BUILDING, 439.
Timber Stage, A, 216
Town Planning, a Point in, 534
Training School for Constructional Industries and Professions at Arcueil-Cachan, near Paris, 117

WAYLEAVES FOR TELEPHONES AND TELEGRAPH POLES AND LINES, 31
Work Bench, The Hollyman Patent, 528

CONTENTS, FIRE-RESISTING CONSTRUCTION SECTION.

BLACKLER'S STORES, Liverpool, 327
British Fire Prevention Committee's Official Tests, 61, 330
British Uralite Co.'s Fire-resisting Products, 468
Building Materials and Their Fire-resisting Properties, 544
Business Building in Berlin, a Big, 148

CONCRETE AGGREGATES AND FIRE RESISTANCE, 59
Concrete Institute, The, 9, 63, 171, 191, 273, 324, 547
Concrete Town, A, 328
Construction of Earthquake-proof Dwellings, 323
Corrosion of Steel Reinforcement in Concrete, 326

DANGER OF FIRE IN EARTHQUAKE ZONES, 147
FIRE PREVENTION IN 1908, Notes, 549
Fireproofing the Dwelling, 464
Fires, Paris Drapery Store, 59
In 1908

HARDWOODS AND FIRE-RESISTANCE, 149, 329
High-pressure Fire Protection, 147
Hospital, An Inexpensive Fire-resisting, 461
KOHL BUILDING, San Francisco, The 242
L.G.B. AND FIRE DANGER, 237
L.C.C. Regulations for Cinematographs, New, 324

MILL AT BRIGHOUSE, Fire-resisting, 322
"Mon'lithcrete": A New Method of Construction, 151, 243

NATIONAL FIRE BRIGADES UNION, 237

POST OFFICE BUILDING, New Fire-resisting, 545

REINFORCED CONCRETE BUILDINGS IN TORONTO, 330
Construction: Design, Quantities, and Practice, 461, 543
Roller Shutter Doors, Tests of, 243, 255

SELFRIDGE STORES, Fire-protection at the, 238
Setting of Portland Cement, The, 547
State Buildings, Fireproof, 241
Steel Frame Building Encased in Concrete, 325

TESTS AT THE KLEINE EXHIBIT, Olympia, 464
of a Reinforced Terracotta Column, 237

for Concrete, a New, 244
with Extinguishers, 242
with Fire-resisting Doors, 154

UNDERGROUND RAILWAYS, Fire Protection on the, 61

CONTENTS, CONCRETE AND STEEL SECTION.

AQUEDUCT, a Reinforced Concrete, 94, 186

BRITISH ALUMINIUM CO.'S WORKS, Kinlochleven, N.B., 15
Built-in Beams, 592

COLOURED CONCRETE!, 501
Commercial Aspect of Reinforced Concrete, 171, 191

CONCRETE AT OLYMPIA, 411; Bridge, a Strong, 501; In Arched Bridge Construction, 273; Institute, 9, 63, 171, 191, 273, 324, 547
Construction and Commonsense, 585
Contractor and Sub-Contractor, 275
Croydon Central Baths, Scarborough Road, 13

DANGERS OF BREEZE CONCRETE, The, 412, 550

EARTHQUAKES AND FRAME BUILDINGS, 93; and Reinforcement, 585
Economy of Reinforced Concrete, The, 501

FINANCIAL STANDPOINT, The, 585

GOVERNMENT OUTPUT IN PUBLIC WORKS, The, 98
G.P.O., The New King Edward Building of the, 586

GRAIN SILOS AND FLOUR MILLS, Edinburgh, 12
Guide to Reinforced Concrete Design, a, 509; to the Foreman and Clerk of Works, a, 585

HOW CEMENT IS MADE, 508

INDENTED STEEL BAR SYSTEM, The, 501
Is Reinforced Concrete Economical?, 585

MAKING CEMENT WITHOUT BURNING ALL INGREDIENTS, 93
Methods of Attaching Shafting and Machinery in Reinforced Concrete Buildings, 195
Monolithic Construction and Methods of Calculating Stresses, 11, 96

REINFORCED CONCRETE BRIDGE IN KENT, a 102; in Foundations, 100; Systems—The Chain, 18, 98; The Considere, 283, 412

REPORT ON REINFORCED CONCRETE, American Civil Engineers', 185
Reports on Tests at Birmingham New Telegraph Stores, 102
Rusting of Steel inside a Concrete Covering, 17

SELFRIDGE STORE, The, 187, 276, 502, 588
Specification for Ferro-concrete Standard, 282
Stresses in Roof Trusses, 510

TAKING OUT WEIGHTS IN IRONWORK, 97
Testing Machine, A Huge, 281
Tests on Reinforced Concrete Beams at McGill University, 504
Theatre in Reinforced Concrete, a, 281

VIEWS AND REVIEWS, Concrete "A Handbook for Engineers and Architects," 586; "Reinforced Concrete Construction," 590; "Simplified Methods of Calculating Reinforced Concrete," 590; "The United Kingdom Fireproofing Company's Catalogue," 590; "Concrete Construction," 590; "Hotel in Reinforced Concrete," 590; "Elements de Résistance des Matériaux appliqué au Béton Armé," 591; "Transactions and Notes of the Concrete Institute," 591

WHEELS OF REINFORCED CONCRETE, 185

ILLUSTRATIONS.

ABBEY, Beaulieu, Readers' Pulpit at, 577; Shrewsbury, Readers' Pulpit at, 578; Tupholme, Lincolnshire, Readers' Pulpit at, 577.
Aberystwyth, National Library of Wales, Design submitted by R. Wynn Owen, A.R.I.B.A., 603, 604; Design submitted by Arthur Harrison, F.R.I.B.A., 605; Design submitted by Henry T. Hare, F.R.I.B.A., 606, 607; Design submitted by Adams and Holden, 607, 608; Accepted Design, submitted by Sidney K. Greenslade, A.R.I.B.A., 610, C.P., June 30th.
Additions to the National Gallery, London, 583, 584.
Adshead, Mr. L. Stanley, F.R.I.B.A., (Portrait), 271.
Adjustable Shelving for Libraries, 410.
Agricultural Building, Alaska-Yukon Pacific Fair, 1909, 315.
Alaska-Yukon Pacific Fair, 1909, 315, 317—319, C.P., April 14th.
Alterations and Additions to Sennowe Hall, Norfolk, C.P., June 16th.
Architectural Association at Play. Sketches by our Special Artist at the Production of the "Rise and Fall of Architecture," 289; at work, the. Sketches by our Special Artist at the Reading of Mr. John A. Marshall's Paper, 267;
Auditorium of one of the Permanent Buildings, Alaska-Yukon Pacific Fair, 1909, 317.

BALCOMBE, Sussex, House at, 203.
Baldock, Herts, House at, C.P., June 23rd.
Bank of Speyer and Co., Basle, Switzerland, 482.
Basle, Switzerland, Bank of Speyer and Co., 482.
Beaulieu Abbey, Readers' Pulpit at, 577.
Belcher, John, R.A. (portrait), 87.
Berkhamsted, House at, 269.
Berlin, the New Charlottenburger Bridge, 473, 475, 477; The Royal Library, 580, 581.
Beverley, County Council Offices, additions to the East Riding (Yorks.), C.P., Feb. 24th; Public Library, 3.
Blackpool Central Library Competition: First Premiated Design, 142—144; Designs bracketed for second place, 159, 161, 163, 165, 167.
Borough Polytechnic Institute, Hall in the, 152.
Boston, Massachusetts, U.S.A., New Synagogue at, 575.
Boulevard des Invalides, Paris, House of Mr. Mewès, 336.
Brass Gates for the Mausoleum of the late Maharajah of Mysore, 201.
Buenos Ayres, Monument to be erected at, 249.
Building Exhibition, General View from the Gallery, 380; Illustrations of the Exhibits, 350—400, 418—424; Open, Mr. Ernest George declaring the, 343; Sketches at the, by Our Special Artist, 345.
Buildings at the Alaska-Yukon Pacific Fair, Seattle, C.P., April 14th.
Bullen, William (Portrait), 302.
Cambridge, Emmanuel College, 235, and C.P., March 17th.

CAMPANILE of St. Mark, Venice, 491.
Campo Santo, Designs for a, 250-253, and C.P., March 24th.
Cathedral, Chester, Readers' Pulpit at, 576; Lincoln, from the Canal, 453.
Ceiling, The "Fish" Room, Audley End, Essex, 262.
Chalfont-St.-Giles, House at, 494.
Charlottenburger Bridge, Berlin, the New, 473, 475, 477.
Chateau de Rochfort-en-Yvelines (Seine et Oise), 430, 433, C.P., May 5th.
Chelmsford, House at, London Road, C.P., May 19th.
Chester Cathedral, Readers' Pulpit at, 576.
Church House, Wrexham, 321.
Church, St. Bartholomew the Great, Smithfield: The Old Gateway, 557.
Clapham, Mr. F. Dare, F.R.I.B.A., (Portrait), 559.
Cleveland District, Yorkshire, House in the, 229, 231, 232.
Club, The Royal Automobile, Pall Mall, London, 339, C.P., April 21st.
College, Emmanuel, Cambridge, 235 and C.P., March 17th.
Colonnade Chateau de Rochfort-en-Yvelines (Seine et Oise), 430.
Competition, Blackpool Central Library (see Blackpool).
Bury Secondary School (see Plans).
Middlesbrough Public Library (see Middlesbrough).
National Library of Wales, Aberystwyth (see Aberystwyth).
Corner of the Alaska-Yukon Pacific Fair, 1909, A, 318.
Cottage at Preston Deanery, 103.
Cottages, Design for a Row of, 7.
Whitley Wood, Berks, C.P., April 7th.
County Council Offices, Beverley: Additions to the East Riding (Yorks.), C.P., Feb. 24th.
County Hall, Design for a, C.P., Jan. 20th.

DAVIDSON, John (Portrait), 303.
Davis, Arthur J. (Portrait), 335.
Denver, James (Portrait), 302.
Designs for a County Hall, C.P., Jan. 20th; for a Row of Cottages, 7; for a Campo Santo, 250—253, and C.P., March 24th; for Doors by James Gibbs, Some, C.P., Feb. 17th; for Windows by James Gibbs, Some, C.P., Feb. 3rd.
Details of Leadwork on Turret, 29.
Dock Extension, Southampton, London and South Western Railway, 215.
Dolgelly, Proposed Library and Institute, 492.
Doors, Some Designs for, by James Gibbs, C.P., Feb. 17th.
Dunedin, House at, 299.

EASTEN, Stephen (Portrait), 302.
Edgar Allen, Library, Sheffield University, 429.
Elliott's Improved Revolving Door, 217.
Emmanuel College, Cambridge, 235, and C.P., March 17th.
Exeter, Extensions at Heles Schools, 325.

FAIR, The Alaska-Yukon Pacific, 1909, 315, 317—319, C.P., April 14th.
Farnham, Surrey, House at Binton Park, 487.
Finchley, Houses at the Garden Village, 213; Residence at Hendon Lane, C.P., March 3rd.
Fire at the Premises of Messrs. W. N. Froy, 570.
"Fish" Room: Ceiling, Audley End, Essex, 262.
Footbridge over the River Wey, Guildford, Proposed, 291, C.P., April 7th.
Frensham, Surrey, House at, C.P., April 28th.
Froy, Messrs. W. N., Fire at the Premises of, 570.

GARDEN VILLAGE, Finchley, Houses at the, 213.
Gates, Brass, for the Mausoleum of the Late Maharajah of Mysore, 201.
Gateshead, St. George's Parochial Hall and Buildings, 560.
Gateway, The Old, St. Bartholomew the Great, Smithfield, 557.
General View of the Building Exhibition from the Gallery, 380.
George, Mr. Ernest, declaring the Exhibition Open, 343.
German Civic Architecture, A Recent Example of, 473, 475, 477.
German Delegates at the Exhibition, 423.
Gloucester, High School for Girls, 69, 71, and C.P., Jan. 27th.
Gloucestershire, The Rebuilding of Netherswell Manor, C.P., May 12th.
Guildhall, London, New Rating Offices at the, C.P., Jan. 13th.

HALL IN THE BOROUGH POLYTECHNIC INSTITUTE, 152.
Hamburg-America Line, Interior Decorations on the s.s. "Kaiserin Auguste-Victoria, 431, 432.
Hampstead Garden Suburb, Hampstead, N. Part of a Group of Twelve Houses, C.P., May 26th; Houses at, C.P., June 2nd.
Hampstead, Small House and Studio near North End Road, 568.
Harcourt, Mr. Lewis, at the Exhibition, 419.
Harrismith, Natal, The Town Hall and Public Offices, 109—112.
Heles Schools, Exeter, Extensions at, 325.
Higgs, W. Millar (Portrait), 64.

High School for Girls, Gloucester, 69, 71, and C.P., Jan. 27th.
Hope, William Henry (Portrait), 303.
Hospital, St. Bartholomew's, London, The New Pathological Block, 562.
Hotel, The Ritz, London, 337.
House and Studio, near North End Road, Hampstead, Small, 568.
Houses at Balcombe, Sussex, 203; at Baldock, Herts, C.P., June 23rd; at Berkhamsted, 269; at Binton Park, Farnham, Surrey, 487; at Chalfont-St.-Giles, 494; at Crossens, Southport, 524; at Didsbury, near Manchester, C.P., Jan. 6th; at Dunedin, 299; at Frensham, Surrey, C.P., April 28th; at Hendon Lane, Finchley, C.P., March 3rd; at London Road, Chelmsford, C.P., May 19th; at New Southgate, C.P., April 28th; at Paulerspury, Northants, 567, C.P., Jan. 20th; at Selwyn Road, New Malden, Surrey, 179; at Sutton, Surrey, 139, C.P., June 9th; at the Garden Village, Finchley, 213; in the Cleveland District, Yorkshire, 229, 231, 232; in Willbury Road, Letchworth, 27; of Mr. Mewès, Boulevard des Invalides, Paris, 336.

ILLUSTRIOUS FOOTSTEPS, The Newest Junior Following in, 170.
Il Palazzo de Nobili, Montepulciano, Italy, C.P., March 10th.
Italy, Il Palazzo de Nobili, Montepulciano, C.P., March 10th.

JAPANESE SUMMER-HOUSE, with Trellis Shutters, 458; Torii, Design for a Pergola adapted from the, 457.

LEADWORK ON TURRET, Details of, 29.
Letchworth, House in Willbury Road, 27.
Libraries, Adjustable Shelving for, 410.
Library and Institute, Dolgelly, Proposed, 492.
Library, Beverley Public, 3; The Edgar Allen, Sheffield University, 429; The Royal, Berlin, 580, 581; The Welsh National, Aberystwyth. Accepted Design, C.P., June 30th.
Lincoln Cathedral from the Canal, 453.
Lloyd's Avenue, E.C., Offices, No. 1, 499, 500.
London and South Western Railway Dock Extension, Southampton, 215.
Lowgate, Hull, The Sun Insurance Office, C.P., Feb. 18th.

MEMORIAL, The Queen Victoria, London, 516, 517; to Queen Victoria, Study for a, 335.
Merthyr Tydfil, Y.M.C.A., Building, 272, C.P., March 31st.
Mewès, Charles Frederick (Portrait), 334.
Middlesbrough Public Library Competition: 1st Premiated Design, 537, 538; 2nd Premiated Design, 539; 3rd Premiated Design, 541; one of the unsuccessful Designs, 558.
Montgomery, H. C. (Portrait), 342.
Montgomery, H. Greville, M.P., (Portrait), 342.
Monument to be erected at Buenos Ayres, typifying the Independence of the Argentine Republic, 249.
"Morning Post" Building, London, The Vestibule, 337.
Museum, The Victoria and Albert, London, 599—602.

NATIONAL FEDERATION MEETING, Sketches at the, 123.
Gallery, London, Additions to the, 583, 584; Library of Wales, Aberystwyth (see Aberystwyth).
Netherswell Manor, Gloucestershire, The Rebuilding of, C.P., May 12th.
Newest Junior in one Provincial Office follows in Illustrious Footsteps, 170.
New Rating Offices at the Guildhall, London, C.P., Jan. 13th.
New Southgate, House at, C.P., April 28th.

OFFICES, 1, Lloyd's Avenue, E.C., 499, 500.
Olympia, 342.

PALACE OF JUSTICE, Rome, The New, 257.
Palace of Social Economy and of the Congresses at the Paris Exhibition, 1900, 403.
Paris Exhibition, 1900, Palace of Social Economy and of the Congresses at the, 403.
Parochial Hall and Buildings, Gateshead, St. George's, 560.
Pathological Block, St. Bartholomew's Hospital, London, The New, 562.
Paulerspury, House at, 567, C.P., Jan. 20th.
Pergola adapted from the Japanese Torii, Design for a, 457.
Planimeter, A Simple, 566.
Plans: House at Didsbury, near Manchester, 5; Bury Secondary School Competition, 1st Premiated Design, 24, 25; 2nd and 3rd Premiated Designs, 26; House, Letchworth, 27; Design for County Hall, 51; Girls' New High School, Gloucester, 72, 73; Sun Fire Office, Lowgate, Hull, 114; House at Sutton, Surrey, 141; Blackpool Central Library Competition: First Premiated Design, 143; Five Designs Bracketed for second place, 159, 161, 163, 165, 167; Extension of the East Riding (Yorks.) County Council Offices, Beverley, 168; Proposed Residence, Hendon Lane, Finchley, 177; House at Selwyn Road, New Malden, Surrey, 180; House at Balcombe, Sussex, 204; Garden Village, Finchley, 212; House in the Cleveland District, Yorkshire, 231; Hellenic House (Delos), according to Vitruvius (as Revised), 295; The Royal Automobile Club, Pall Mall, London, 340, 341; Kensington Fire Station, 404, 405; House at Frensham, near Farnham, Surrey, 406; Royal Southern Hospital (Liverpool), Extension Competition, 407, 408; House at New Southgate, 424; Chateau de Rochfort-en-Yvelines (Seine et Oise), 433; Chemical Laboratory, 479; House, London Road, Chelmsford, 480; Square of Twelve Houses, Hampstead Way, Hampstead Garden Suburb, 493; St. Luke's Vicarage, Hornsey, N., 519; Houses at Hampstead Way, 521; House at Crossens, Southport, 524; Middlesbrough Public Library Competition: 1st Premiated Design, 537, 538; 2nd Premiated Design, 539; 3rd Premiated Design, 541; House at Sutton, Surrey, 542; Unsuccessful Design for the Middlesbrough Public Library, 558; St. George's Parochial Hall and Buildings, Gateshead, 560; New Pathological Block, St. Bartholomew's Hospital, London, 563; Alterations and Additions to Sennowe Hall, Norfolk, 564; Society of Architects' Travelling Studentship, Design placed First, 565; Small House and Studio near North End Road, Hampstead, 568; Refectory Pulpit, Chester Cathedral, 576; Refectory Pulpit, Beaulieu Abbey, 577; Refectory Pulpit, Shrewsbury Abbey, 578; The Royal Library, Berlin, 580; House at Baldock, Herts, 582; Victoria and Albert Museum, London, 602; National Library of Wales; Design submitted by R. Wynn Owen, A.R.I.B.A., 603; Design submitted by Arthur Harrison, F.R.I.B.A., 605; Design submitted by Henry T. Hare, F.R.I.B.A., 606, 607; Design submitted by Adams and Holden, 607; Accepted Design, Sidney K. Greenslade, A.R.I.B.A., 610, C.P., June 30th; Design submitted by A. Marshall Mackenzie, A.R.S.A., and Son, 609.
Plates, Centre: House at Didsbury, near Manchester (Fair and Myer, A.R.I.B.A., architects), Jan. 6th. New Rating Offices at the Guildhall, London (Sydney Perks, architect), Jan. 13th; New House at Paulerspury (Herbert Norman, architect), Jan. 20th; Design for a County Hall (Colin J. Macdonald and J. Harold Sayner, A.R.I.B.A., architects), Jan. 20th); Girls' New High School, Gloucester (Walter B. Wood, A.R.I.B.A., Architect), Jan. 27th; Some Designs for Windows, by James Gibbs, C.P., Feb. 3rd; The Sun Insurance Office, Lowgate, Hull (B. S. Jacobs, F.R.I.B.A., Architect), Feb. 10th; Some Designs for Doors by James Gibbs, Feb. 17th; Additions to the East Riding (Yorks), County Council Offices, Beverley (B. S. Jacobs, F.R.I.B.A., architect), Feb. 24th; Residence, Hendon Lane, Finchley (Bennett and Stratton, Architects), March 3rd; Il Palazzo de Nobili Montepulciano, Italy (drawn by Leslie Wilkinson), March 10th; Emmanuel College, Cambridge (Measured and Drawn by W. J. Walker Todd), March 17th; Designs for a Campo Santo by Students of the Architectural School, Liverpool University, March 24th; Proposed Y.M.C.A. Building, Merthyr Tydfil (Ivor Jones, A.R.I.B.A., and Percy Thomas, Architects), March 31st; Cottages, Whitley Wood, Berks (C. B. Willcocks, Architect), April 7th; Proposed Footbridge over the River Wey (Davies and Swayne, Civil Engineers), April 7th; Buildings at the Alaska-Yukon Pacific Fair, Seattle, April 14th; The Royal Automobile Club, Pall Mall, London (Mewès and Davis, and E. Keynes Purchase, Associated Architects), April 21st; House at New Southgate (Castle and Warren, Architects); House at Frensham, Surrey (Arthur J. Stedman, Architect), April 28th; Chateau de Rochfort-en-Yvelines (Seine et Oise), May 5th; The Rebuilding of Netherswell Manor, Gloucestershire (E. Guy Dawber, Architect), May 12th; House at London Road, Chelmsford (C. H. B. Quennell, F.R.I.B.A., Architect), May 19th; Part of a Group of Twelve Houses, Hampstead Way, Hampstead Garden Suburb, N., May 26th; Houses at Hampstead Garden Suburb (Geoffrey Lucas, Architect), June 2nd; House for C. J. Heffer, Esq., at Sutton, Surrey; "Hillridge," Sutton, Surrey (H. D. Searles-Wood, F.R.I.B.A., Architect), June 9th; Alterations and Additions to Sennowe Hall, Norfolk (G. J. and F. W. Skipper, FF.R.I.B.A., Architects), June 16th; House at Baldock, Herts, for William Sale, Esq. (Geoffry Lucas, Architect), June 23rd; The Welsh National Library, Aberystwyth. Accepted Design (Sidney K. Greenslade, A.R.I.B.A., Architect), June 30th.
Portraits: W. Millar Higgs, 64; John Belcher, R.A., 87; D. Stanley Adshead, F.R.I.B.A., 271; Stephen Easten, 302; James Denver, 302; William Bullen, 302; John Tomlinson, 302; W. R. Thompson, 303; John Davidson, 303; William Henry Hope, 303; Charles Frederic Mewès, 334; Arthur J. Davies, 335; H. Greville Montgomery, M.P., 342; H. C. Montgomery, 342; Henry Tanner, Junr., F.R.I.B.A., 559; F. Dare Clapham, F.R.I.B.A., 559; C. Wontner Smith, A.R.I.B.A., 559.
President and Vice-President of the Architectural Association: Mr. Henry Tanner, F.R.I.B.A.; Mr. F. Dare Clapham, F.R.I.B.A.; Mr. C. Wontner Smith, A.R.I.B.A., 559.
Preston Deanery, Cottage at, 103.
Preventer, Smoke Blow-down, 218.
Prince and Princess of Wales at The Exhibition, 418.
Queen Victoria Memorial, London, The, 516, 517.
Readers' Pulpits at Chester Cathedral, 576; Tupholme Abbey, Lincolnshire, 577; Beaulieu Abbey, 577; Shrewsbury Abbey, 578.
Revolving Door, Elliott's Improved, 217.
Ritz Hotel, Piccadilly, London, 337
River Wey, Guildford, Proposed Footbridge over the, 291, C.P., April 7th.
Rome, The New Palace of Justice, 257.
Royal Automobile Club, Pall Mall, London, 339, C.P., April 21st.
Royal Library, Berlin, The, 580, 581.

ST. BARTHOLOMEW'S HOSPITAL, London, The New Pathological Block, 562.
St. Bartholomew the Great, Smithfield, The Old Gateway, 557.
St. George's Parochial Hall and Buildings, Gateshead, 560.
St. Luke's Vicarage, Hornsey, N., 518—520.
St. Mark, Venice, The Campanile, 491.
Sculptured Relief Panel in Oxydised Silver, "White Horses," 515.
Selfridge Store, London, The, 496.
Sennowe Hall, Norfolk, Alterations and Additions to, C.P., June 16th.
Shelter and Promenade, Whitley and Monkseaton, Proposed, 49.
Shrewsbury Abbey, Readers' Pulpit at, 578.
Simple Planimeter, A, 566.
Sketches at the Architectural Association, 267; at the A.A., Play, 289; at the Luncheon following the Opening of the Building Exhibition, 345; at the National Federation Meeting, 123.
Smith, Mr. C. Wontner, A.R.I.B.A., (Portrait), 559.
Smoke Blow-down Preventer, 218.
Society of Architects' Travelling Studentship (1909), Design placed first, 565.
Southport, House at Crossens, 524.
Staircase, Schweizrischer Bankverein, Zurich, 338.
S.S. "Kaiserin Auguste-Victoria," Hamburg-America Line, Interior Decorations, 431, 432.
Study for a Memorial to Queen Victoria, 335.
Summer-house, Japanese, 458.
Sun Insurance Office, Lowgate, Hull, C.P., Feb. 10th.
Sutton, Surrey, House at, 139.
Switzerland, Bank of Speyer, and Co. Basle, 482.
Synagogue at Boston, Massachusetts, U.S.A., New, 575.

TANNER, Mr. Henry, Junr., F.R.I.B.A. (Portrait), 559.
Thompson, W. R. (Portrait), 303.
Tomlinson, John (Portrait), 302.
Town Hall and Public Offices, Harrismith, Natal, 109—112.
Travelling Studentship of the Society of Architects, Design placed First, 565.
Tupholme Abbey, Lincolnshire Readers' Pulpit at, 577.

VESTIBULE, "Morning Post," Building, London, 337.
Vicarage, St. Luke's, Hornsey, N., 518—520.
Victoria and Albert Museum, London, The, 599—602.

WASHINGTON STATE FISHERIES BUILDING, Alaska-Yukon Pacific Fair, 1909, 319.
"White Horses:" Sculptured Relief Panel in Oxydised Silver, 515.
Whitley and Monkseaton, Proposed Shelter and Promenade, 49.
Whitley Wood, Berks, Cottages at, C.P., April 7th.
Windows, Some Designs for, by James Gibbs, C.P., Feb. 3rd.
Wrexham Church House, 321.

Y.M.C.A., Building, Merthyr Tydfil, 272, C.P., March 31st.

ZURICH, Staircase, Schweizrischer Bankverein, 338.

ILLUSTRATIONS, CONTRACTORS' SECTION.

BUILDING in Mombasa, 120.

HOW TO FELL A TALL CHIMNEYS: Cutting away the Brickwork for the Struts, 33; Elevation and Plan of the Struts, 33; The Chimney Base Ready for Felling, 34; The Chimney at the Moment of the Explosion, 34; The Chimney in the Act of Falling, 34.

LONDON AND SOUTH WESTERN RAILWAY DOCK EXTENSION, Southampton, 215.

MORTICE LOCK, The Stevens Patent, 528.
SCAFFOLD, A Belgian Portable, 438.
Scaffolding and Appliances at the Building Exhibition, 438; in Brussels, 525.
Self-supporting Curved Iron Roofs, Details, 35.
TIMBER STAGE, A, 216.
Training School at Arcueil-Cachan, near Paris, 117—119.
WORK BENCH, The Hollyman Patent, 528.

ILLUSTRATIONS, FIRE-RESISTING CONSTRUCTION SECTION.

AERO FIRE ALARM, The, 241.

BALLOON SHED, Army Balloon Factory, Aldershot, 468.
Blackler's Stores, Liverpool, 327, 328.
British Fire Prevention Committee's Tests, 63, 243.

FIRE ESCAPE, The New American, 553.
Fire, St. Denis Drapery Store, Paris, 58, 59, 60.
Floor Construction, Blackler's Stores, Liverpool, 328.

GRINNELL SPRINKLER, The, 240, 241.

HAND PUMPS AND ORDINARY BUCKETS, etc., used, 62.
High Pressure Tanks for Country Houses, 330.
House, Cedarhurst, Long Island, U.S.A., 465, 467.
House at Bogota, N.J., U.S.A., 466.

KING EDWARD VII. HOSPITAL, Windsor: Exterior Elevation, 461; View of the Big Ward Block, 462; View from the Rear, 464; Interior First Floor Ward, 464.
Kohl Building, San Francisco, 242.

MON'LITHCRETE TEST, The, 243.

PASSAGE, Kaufhaus, Berlin, The, 148—151.
Plans: King Edward VII. Hospital, Windsor, 462, 463; Fire-resisting House, Long Island, U.S.A., 465, 467; House at Bogota, N.J., 466.
New Western District Post Office, Wimpole Street, London, W., 546.
Post Office: New Western District, Wimpole Street, London, W.; General View before the Erection of the Facade, 545; Side Elevation, 545; Interior, 546; Detail of Watching Gallery, 547.

REINFORCED TERRA-COTTA COLUMN, Compression Curves for Loading and Release, 237.
Roller Shutter Doors after Test, 243.

SELFRIDGE Store Construction, 238, 239, 240.

URALITE FIRE - RESISTING DOORS, 468.

ILLUSTRATIONS, CONCRETE AND STEEL SECTION.

AQUEDUCT, A Reinforced Concrete, Old Aqueduct with Sluice Gate Open to Drain Canal, 94; Driving Foundation Piles for Eastern Buttress Walls, 94; Works submerged during Flood of River, 95; "Hole" full of Water, showing Pile Driver immersed to Smoke Stack, 95; Water Rushing over Western Arch after Canal Coffer Dam had given way, 95; Showing New River Bed and Panel Forms for Buttress and Middle Walls in Position, 95; Middle Wall Completed and Forms for Canal Side Walls in position, 96; Panel Construction of Forms for Walls, 96; Section of Forms for Beams in Canal Bottom, 97; Cross Section of Aqueduct, 186; View of Forms for Wing Walls Partly Filled, showing Reinforcing Bars, 186; Sections of Beams in Canal Bottom, 186; View of Forms for Berm Path Slab and Supporting Beam, showing Canal Side, Wall Partly completed; New Aqueduct completed, 187.

BANK STRONG ROOM IN LEEDS, 100.
Bridge, Reinforced Concrete, over the River Stour, Chilham, Kent, 102.
British Aluminium Co.'s Works, Kinlochleven, 15—17.

CAMBRIDGE UNIVERSITY CHEMICAL LABORATORY EXTENSION, 591.
Castleford Secondary School, 19.
Considere System, The end of a Continuous Girder, 283; Spiralled Concrete Piles, 283; Group of Piles with Outer Shell removed, 412; Railway Bridge over the River See at Avranches, France, 413; Viaduct over the G.E. Railway, 414.

DIAGRAM FOR CALCULATING EFFECTIVE DEPTHS OF SLABS AND RECTANGULAR BEAMS, 509.

EDINBURGH, Grain Silos and Flour Mills, 12.

FLOOR OF SCHOOL AT CASTLEFORD, 98.
Foundations, Reinforced Concrete, 101, 102.

GRAIN SILOS AND FLOUR MILLS, Edinburgh, 12.

HENNEBIQUE STIRRUP, 587.

KING EDWARD BUILDING, General Post Office, London, The Detail View of West Elevation, 586, 587; View of the Loading Yard, 586; Erection of the Facade, 587.

MAJESTIC THEATRE BUILDING, Los Angeles, 281, 282.

PLAN: Cambridge University, Chemical Laboratory Extension, 590.

SELFRIDGE STORE, London, The Steelwork Plan, Second Floor, 188; Portion of Grillage Foundation Plan, 190; Section through Retaining Wall, Oxford Street, 191; Plan of Grillage at Section 76b—192; Details of Cantilever Foundation Girder, 277; Trench for Centre Party Wall, and Track for Travelling Crane, 276; showing Rise of Centre Party Wall, 277; View from Oxford Street, 278; Part of First Floor Framing Plan, 278; Part of Fourth Floor Framing Plan, and Part of Roof Framing Plan, 279; Grillage for Cantilever Foundations 280; Steelwork nearly completed, 280; Building nearing Completion, 502; Framing for Lift Enclosures, 502; General View of the Steelwork, 504; Arrangement of Spandril Beams, 505; Method of Cantilevering Cornice, 506; Method of Carrying Stonework, 507; Erection of the Steelwork, 507; Shop Drawing for Steel Columns, 588; Detail of Bent Plate Girder, 588; Shop Details for Beams, 589.
Storage Reservoir, Pudsey, Yorkshire, 99.
Switches, "Diamond H.," 20.

TELEGRAPH STORES, Birmingham, 102.
Testing Machine, A Giant, 281.

ARTISTS AND AUTHORS.

ADAMS AND HOLDEN, 607, 608.
Adams, Henry, 81, 90, 127.
Allen, H. Colin, 583.
Appleyard and Quiggin, 26.
Atkinson, R. Frank, F.R.I.B.A., 343, 496, 588.
Ayling, R. Stephen, 53.

BAILEY, T. J., 168.
Baillie-Scott, M. H., 270.
Bamber, H. K. G., 547.
Barker, W. E., 557.
Bennett and Stratton, 177, 212, 213, C.P., March 3rd.
Boynton, Louis, 465, 467.
Braithwaite, W. S., 19.
Briggs, and Wolstenholme, and Thornley, 408.
Brock, Thomas, R.A., 516, 517.
Buckland, H. T., 113, 139.
Budden, Lionel B., 250, C.P., March 24th.
Butler, D. B., A.M.Inst.C.E., F.C.S., 412, 550.
Bylander, S., 188, 238, 276.

CARTER, G. F., 14.
Cash, John, 3.
Castle and Warren, 26, 424, C.P., April 28th.
Chatterton and Couch, AA.R.I.B.A., 499, 500.
Chatterton, Frederick, A.R.I.B.A., 347—400.
Chedanne and Casq, 249.
Cooper and Slater, 167, 541.
Cratney, Edward, 49.
Cross, A. W. S., M.A., F.R.I.B.A., 343.
Cullen, Lochhead, and Brown, Alexander, 142—144.

DAVIES, J., 321, 459.
Davies and Swayne, 291, C.P., April 7th.
Dawber, E. Guy, 164, C.P., May 12th.
Depierres, Gaston, 301, 526.

EAST, Alfred, R.A., 343.
Elwes, H. J., F.R.S., 304.
Ende, Max, Am., 510.

FAIR AND MYER, 5, C.P., Jan. 6th.
Fermaud, Edmund A., 492.
Fletcher, A. E., M.S.E., 97, 566.
Forbes and Tate, 494.
Forbes, James, 229, 231, 232.
Forrest, G. Topham, M.S.A., 478.

GARDNER, H. R., 163.
Gardner, Starkie, 452.
George, Ernest, 109.
Gibbs, E. M., F.R.I.B.A., 429.
Gibbs, James, C.P.'s, Feb. 3rd and 17th.
Green, A. Romney, B.A., 180.
Greenslade, Sidney K., A.R.I.B.A., 610, C.P., June 30th.
Gregeen, Hugh S., 216.
Gunn, Edwin, 576—578.

HAIGH AND THOMPSON, 407.
Halliday, T. Thomas, 24, 25.
Hare, Henry T., F.R.I.B.A., 606, 607.
Harrison, Arthur, F.R.I.B.A., 605.
Hastings, Harold, M.I.E.E., A.M. Inst.C.E., 568.
Hooper, Basil, A.R.I.B.A., 299.
Horsburgh, Victor D., A.R.I.B.A., 439.
Hudson, C. H., 565.
Hyde, Vere Sussex, 100.

I'ANSON, E. B., 562, 563.

JACOBS, B. S., 114, 168, C.P., Feb. 10th, 24th.
Jerdan and Emery, 139, 141, 518—520.
Jones, F. W. Doyle, 515.
Jones, Ivor, A.R.I.B.A., and Percy Thomas, 272, C.P., March 31st.

KAHN, Moritz, 461, 543.
Kemp, Harold, 179.
Kemp, Herbert C. T., 33.

LANCHESTER, H. V., 160.
Lemon, E. Campbell, 252, C.P., March 24th.
Llovd, T. Alwyn, and H. Colin Allen, 481.
Lucas, Geoffrey, 493, 521, 582, C.P., May 26th, June 2nd.

MACARTNEY, Mervyn E., B.A., F.R.I.B.A., F.S.A., 162, 343.
Macdonald, Colin J., 51, and C.P., Jan. 20th.
Macdonald, F. A., 12.
Mackenzie, A. Marshall, A.R.S.A., and Son, 609.
Markham, John H., 72.
Marshall, John A., 266.
Matthews, Ernest R., A.M.Inst.C.E., F.R.S.E., 326.
Mawson, T. H., 87.
Mewès, Chas. F., 430—433, 482, C.P., May 5th.
Mewès and Davis, 334—341, 403.
Mitchell, G. S., 31.
Montgomery, H. Greville, M.P., 342.

NORMAN, Herbert, 103, 567, C.P., Jan. 20th.

OWENS, J. S., B.A., M.D., 244, 284.
Owen, R. Wynn, A.R.I.B.A., 603, 604.

PAXTON, R. B. M., 123, 267, 289, 345.
Payne, Arthur C., 453.
Pearson, Lawrence L., 203, 204.
Perks, Sidney, C.P., Jan. 13th.
Pesenti, Cæsar, 323.
Pite, Beresford, Professor, 234.
Plumbe, Rowland, 152.
Potter, C. H., 165.
Prestwich, E., 253, C.P., March 24th.
Price and Agutter, 109, 112.
Prothero, Phillott and Barnard, 321.

QUENNELL, C. H. B., F.R.I.B.A., 480, C.P., May 19th.

REILLY, Professor C. H., M.A., 249.
Rhodes, John W., 568.
Richmond, Sir W. B., K.C.B., R.A., 490.
Riley, W. E., F.R.I.B.A., 403.
Rothery, J. Cadogan, 534.
Russell and Cooper, 159, 537, 538.

SAYNER, J. Harold, 51, and C.P., Jan. 20th.
Schultz, R. Weir, 75, 88.
Scott, Alban H., 15—17.
Searle, Alfred B., 214, 298, 524.
Searles-Wood, H. D., 23, 49, C.P., June 9th.
Serraillier, Lucien, 171, 191.
Shepheard, T. Faulkner, 474.
Sill, F. and T. Lawrence Dale, AA.R.I.B.A., 558.
Skipper, G. J., and F. W., 564, C.P., June 16th.
Smith, T. G., 7.
Spielmann, M. H., F.S.A., 337.
Spooner, Charles, 452.
Squires and Wayncoop, 466.
Stedman, Arthur J., 406, 487, 488, C.P., April 28th.
Stevenson and Redfern, 590, 591.
Stratton, P. M., 77.
Swales, Francis S., 290, 314.
Thatcher, A. G. H., 120, 438, 525.

THEAKSTON, Ernest G., 269.
Thomas, W. Aubrey, 327, 328.
Thomson and Bristow, 161.
Tinkler, Reginald, 524.
Todd, W. J. Walker, C.P., March 17th.
Torr, Fred, 170.
Troup, F. D., 169.
Turner, Laurence A., 296.
Turner, Thackeray, F.S.A., 338.

UNDERWOOD AND KENT, 27.

VOYSEY, C. F. A., 229.

WALKER, Robert S., 94, 186.
Ware and Sons, 325.
Warren, Edward, F.S.A., 492.
Waterhouse, Paul, M.A.Oxon., 87.
Webb, Sir Aston C. B., R.A., F.R.I.B.A., 344, 599—602.
Wenyon, G. H. and Charles H. Potter, 539.
West, A. William, 461—464.
Whitehead, R. D., A.M.I.Mech.E., 592.
Wilkinson, Leslie, C.P., March 10th.
Willcocks, C. B., C.P., April 7th.
Williams, James, 256.
Willink and Thicknesse, 408.
Wilson, A. Needham, 177.
Wood, Walter B., 72, 73, and C.P., Jan. 27th.
Wyand, B., 3, 31, 209.
Wylie, Richard, A.R.I.B.A., 560.

January 6, 1909. Volume 29. No. 1.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders - - - - - - - - - 1, 2
"Applications" under the London Building Acts. By B. Wyand - - - - - - 3
Notes on Competitions - - - - - - 4
Our Plate - - - - - - - - - 4
Obituary - - - - - - - - 4
Correspondence - - - - - - - 4
Notes and News - - - - - - - 6
Law Case: Plasterers' Union Lose on Appeal 7
Views and Reviews - - - - - - - 8
Enquiries Answered - - - - - - 8
Works in Progress - - - - - - - 8

CONCRETE AND STEEL SECTION.

The Concrete Institute - - - - - 9—11
Monolithic Construction, and Methods of Calculating Stresses - - - - - - 11
Grain Silos and Flour Mills, Edinburgh - - 12
Croydon Central Baths, Scarbrook Road - - 13
The British Aluminium Co.'s Works at Kinlochleven, N.B. - - - - - - - - 15
Rusting of Steel inside a Concrete Covering 17
Reinforced Concrete Systems: The Chain Concrete System - - - - - - - 18
In Parliament - - - - - - - - 18
Trade and Craft - - - - - - - - 20
Federation News - - - - - - - - 20
Bankruptcies - - - - - - - - 20
Tenders - - - - - - - - vi., viii.
Complete List of Contracts Open xxiii., xxiv., xxvii.

ILLUSTRATIONS.

Beverley Public Library. John Cash, Architect 3
House at Didsbury, near Manchester. Fair and Myer, A.R.I.B.A., Architects - - - 5
Design for a Row of Cottages. T. G. Smith, Architect - - - - - - - - 7
Grain Silos and Flour Mills, Edinburgh. F. A. Macdonald, Structural Engineer - - - 12
The Croydon Central Baths. Half Section of Reinforced Roof Truss and Stancheon. G. F. Carter, M.Inst.C.E., Borough Engineer - - 14
British Aluminium Co.'s Works, Kinlochleven. A Alban H. Scott, M.S.A., Architect 15, 16, 17
The Chain Concrete System - - - 18, 19, 20
New Secondary School, Castleford (Chain Concrete Construction). W. S. Braithwaite, Architect - - - - - - - - - 19
"Diamond H" Switches - - - - - 20

Billiken.

It is the privilege of grandchildren to teach their parents' mothers how to absorb the nutriment of eggs; and it equally falls to the lot of youth, blessed oftentimes with nothing but the consciousness of its own superior worth, to administer salutary lessons in life to those of age and experience. For a whole year or more the United Kingdom has been labouring under a double load of pessimism and depression—a stagnation of business; a great increase in unemployment; a certainty of further taxation; the gathering of war clouds, crowned by the gloomy future which experience always weaves out of these other troubles. Now, if no evil is so great but thinking makes it so, it is clearly time for this nation, great in age, established in tradition and ripe in experience, to be shaken up a little, and some of the self-confidence and buoyancy of the younger peoples added to its qualities. The extraordinary revivification of industry in the United States after one of the worst financial crises in its history, and following the commercial disturbance of a Presidential election, is a striking tribute to the optimism of the American commercial man. In "The Taking of Lungtungpen" Kipling has demonstrated the value, in certain kinds of warfare, of the young and untrained warrior over the old and seasoned soldier. We sit "the-ourising" over the ethics of attack while the American citizen is capturing the town, and his success is attributed by one of our daily contemporaries to the Optimist's League, which was formed during the darkest days of the American financial crisis, and whose members, themselves refusing to believe that all things were for the worst in the worst of all possible worlds, have gradually, but none the less surely, drawn all their fellow-countrymen round to the same point of view. On hundreds and thousands of home and office tables in the United States sits Billiken, the tangible mascot of the optimist operations. The conception of a young girl modeller in an idle moment, reproduced at first only for the amusement of a few friends, he is now run by a limited company, and reproduced by the hundred thousand. Thousands of him are pouring into England to chase away the gloom to provoke a smile for Billiken, the quaint "god of things as they ought to be," is very gentle, and his expansive grin provokes no more than an answering smile; but that answering smile, once produced, can so alter the aspect of a day's work that its close may disclose results that were never visible at its beginning. It needs but nerve and effort to re-establish with us that spirit of healthy optimism that is so fruitful of results over the water. It was our proud boast that we never knew when we were defeated; but if that maxim still holds in warfare it is no longer true of commerce. There is a point when intellect becomes a curse; there is a time when experience develops into a hindrance; let us rather develop new experiences, and give rein to the blind self-confidence of youth. Building has never been in such a bad way! We must then have reached the turning point to something better. Architecture is a lost art! Yet never were the students so keen, never were the facilities of education better; never were the coming men better grounded or of better breeding. Unemployment is rife! Then start to work; Heaven knows it is waiting to be done. There are towns to be built; slums to be cleared; garden cities to be raised. London must one day become a city; it is as yet but a conglomeration of egotistical phantasies. And after London there are Manchester, Liverpool, Birmingham, all waiting for their Baron Haussmanns. Of a truth, we cannot see the wood for the trees. Let the supposed predatory instincts of hen-roost robbing statesmen no longer inhibit enterprise or lock-up capital. Let the Tariff Reformer look to the present year to seal the success of his campaign; let the Free Trader be conscious that 1909 will see the re-establishment of his principles; and let our optimism be reinforced by effort. For optimism may resemble pessimism in this, that it can sit slothfully waiting for something to turn up. Let the architect believe this year will witness his *chef d'œuvre*; and the builder be assured that it will be his most prosperous period. On one class, and one class only, make unending war. Let the sword be drawn upon those men who say the country is old and worked out, that it has reached and passed its zenith, and must inevitably decline. One finds them both in Parliament and out of it, blindly attributing as immutable laws of the universe the operations of sloth and pessimism among the world's inhabitants. It is easy to foster slackness in a generation taught to believe that slackness is but the premonitory symptom of an inevitable decay. It is easier to draw analogies between the slackness which destroyed the Roman and all other empires, and that which afflicts us at this hour, and it is a pastime that has afforded cheap amusement for pessimistic writers in the past. But to-day let us be optimists. We are at the beginning of a new year; we have a clean slate before us. Whether we accomplish much or little, let us accomplish something. Billiken is not needed to help us to be optimistic if we possess the will and the energy, but we may meet him with advantage now and then, as a reminder of what we set out to do. Who, then, will join a British League of Optimists? There are no president, no secretary, no council with warring opinions, no varying grades of membership, no offices, and no dry-as-dust papers to be endured with respectful stoicism. Membership is open to all; and the work, after all, is light. A quiet smile and a blind eye to failure, and to frowns and groans the murmur of one word:—Billiken.

Hope for Rome.

There is hope for Rome. In a previous reference to the wholesale demolition and reconstruction proposed by the municipal authorities, we sought to make it clear that we favoured neither the ultra-engineering nor the ultra-archæological view of the situation, and that we held the citizens to be perfectly justified in regarding Rome as a place to live in rather than as a vast museum of antiquities for strangers and pilgrims to stare at. We regretted that the scheme had been entrusted to an engineer, because it is notorious that in the engineer the bump of veneration does not bulge. He is the incarnation of modernity, and to let him loose on ancient Rome was to cry "Havoc!" We apprehended that such reforms as are necessary might be effected without destroying much that is worth preserving, and that this view is tenable seems to be shown by a report that has been presented by representatives of the various architectural and other artistic societies of Rome. This report is now under consideration by delegates from nine societies, which include the Academy of St. Luke, the Roman Archæological Society, the Society of Architects, and the Society of Italian Architects and Engineers; the delegates comprising most of the best known Roman artists, architects, and archæologists—surely an excellent blend, whereof the elements should be mutually corrective, while the combination should be sufficiently powerful to check any undue tendency towards the mere excess of engineering. The report is said to be very temperate in tone. Nor does it simply protest. It approves and commends the desire for betterment, and formulates an alternative scheme which would secure that object without destroying the more interesting of the buildings that seem to the engineer to obstruct the path of progress. It is now confidently anticipated that this courteous, conciliatory, and altogether dignified remonstrance, supported as it is by the weight of such an array of influential names, will at least mitigate the drastic severity of the engineer's scheme, and will save from indiscriminate destruction those buildings that are best worth preserving.

The Dead Hand in Architecture.

Mr. Leonard Stokes protests against the method of procedure with respect to the proposed additions to the Law Courts in the Strand. He complains that such plans of the proposed work as he has seen "show a colourable imitation of Street's work—in fact, features are borrowed wholesale from different parts of the present building, and collected to form the new wing or block, and it is evidently intended that the new work shall be a sort of réchauffé of Street." This method he regards as a great mistake. If Street were alive, he would not, Mr. Stokes believes, reproduce the work he did some thirty years ago, with all its mistakes. "One would rather imagine that, having learnt by experience, he would make a fresh effort, and evolve something which, though in harmony with the present building, were yet distinct and better, showing that modern Gothic had not stood still for the last quarter of a century." Copying and completing the work of dead men is hardly, Mr. Stokes thinks, one of the legitimate functions of the Office of Works; and he declares that the very endeavour to abide faithfully by the "half-thought-out" details of Brydon's Government buildings in Parliament Street has resulted in the perpetuation by "a department" of mistakes which Brydon would never have made in stone. Any architect, we imagine, who took up the work of a dead man must necessarily find himself in an extremely invidious position; but we suppose Mr. Stokes to imply that "a department" labours under a double disqualification. It is hampered not only by the weight of the dead hand, but also by the fetters of officialdom, whereas an independent architect, judiciously chosen, could assert his individuality with greater freedom. On this point the question assumes considerable delicacy, and it would be difficult to elaborate the argument without wounding the susceptibilities of architects who hold official appointments. Divesting the matter of all personality, and referring merely to the abstract principle, we may perhaps be allowed to say that the issue thus raised intensifies the conviction that we have previously expressed—namely, that the official architect, Government or municipal, should be consultative and advisory rather than executive. As to Mr. Stokes's other point, we are strongly disposed to agree that a building raised to-day, whether or not it is an addition to an existing building, should be invested with the spirit of to-day; as, indeed, willy nilly, it must be to at least some infinitesimal extent, no matter how strict the endeavour to make it a slavish (and incidentally a lifeless) copy of the original. It seems far more candid and courageous, and no whit less reverent, to let the old work influence us in spirit rather than in detail; "for the letter killeth, but the spirit giveth life." In saying this, we are mindful that we have not here a case of "restoration," but that, on the contrary, the proposed addition may be almost regarded as an independent building. We conceive, therefore, that it may rightly assume some degree of individuality of character, and that it may very legitimately make a frank revelation that, while it is closely related to the main fabric, and by no means repudiates the relationship, nor seeks to disguise the family likeness, it has been reared by another hand, and in a later generation.

Legislation for Jack Frost.

Of the making of by-laws there is no end; and much study of them is weariness of the flesh. Far be it from us to advocate an increase in their number; but the recent Arctic weather has very forcibly suggested the necessity of inflicting some restrictions and provisions in the plumbing work of our dwellings, and more especially in our speculatively built dwelling-houses. In one road of our acquaintance over 80 per cent. of the houses had the water supply frozen up, with ghastly results following the thaw; and every severe frost sees the necessary standpipe put up in the road, and the weary trail of the inhabitants to and fro with buckets and jugs. In these houses the main supply pipe is carried up an inner passage wall embedded in the plaster, and has not been known to freeze. It supplies a cistern under the slated roof, and from it the composition supply pipe to the taps, etc., sags gracefully over the ceiling joists till it reaches an outer corner at the back of the house. Here (also imbedded in the plaster) it is carried down on the inside of the wall direct to the kitchen sink on the ground floor, supplying on its way the first floor w.c. and the bath, the last having a branch pipe carried along the whole of the outer wall of the bath-room to the head of the bath. This service pipe is quite away from any chimney flue or ordinary warmth, and, as has been stated, is quite unprotected in the roof. The cost of properly encasing it with felt in wood boxing would be infinitesimal compared with the cost of frequent damage from bursts and the necessary repairs. Yet it is too much to hope, we fear, that a sweet reasonableness will characterise the plumber in arranging the lines of the water supply when working out a piece-work contract on cheap rates; or that the speculator, for whose avaricious shifts the builder is too often blamed, will spend so much money in properly equipping houses which he has no intention of holding if a sweet confiding and investing public will relieve him of the burden. In the direction indicated, some new by-laws might, we think, be fruitful in operation; and they might be substituted for some of those onerous urban restrictions which country districts have madly taken unto themselves under the ægis of the Local Government Board. But the first work of that Board and its energetic President should be to pass such legislation as will enable the rural authorities legally to extricate themselves from toils of their own making.

"Slushfulness."

It is astonishing as the world grows older how the view points of its inhabitants change. In the young days of the present generation the Dickensy Christmas, with its concomitants of snow, warm firesides, roasting chestnuts, ghost stories, mistletoe, and general merriment, was a thing earnestly desired and rarely achieved—principally because the snow, that necessary and indispensable ground colour in the picture, was absent. This Christmas we have had the snow and frost, and also a remarkable ghost story from Norfolk. Written and spoken comment has not, however, extended a welcome to either. We are now so much "a street-bred" people that city dwellers find no place in the scheme of civilisation for either snow or ghost stories. If the latter is too little in evidence the former is too much so. It freezes our marrows, bursts our water-pipes, hampers us in getting about, delays our trains, increases our rates, upsets our constitutions, stops our building operations, and throws out of work more skilled workmen than the unskilled labourers who find a job in helping to get rid of it. And sooner or later it results in that glorious condition of slushfulness, to use Mr. Raphael's word, which has been our portion for the last few weeks. There are few things we can spare so easily, nowadays, "as Nature's fleecy mantle."

A Guild of Assistants.

Anent the various letters which have appeared, and are still appearing, in our columns, advocating the formation of a Guild of Architects' Assistants, we had intended to say a few things in this issue. Criticism, however, must be withheld, for the moment, in view of one or two possible developments which have been suggested to us, and to which we desire to give further consideration. Mr. Dixon's original proposal is not without its merits, and it has evoked a response the country over whch should promise well if the idea comes into the sphere of practical politics. But we hesitate to assist the inception of another architectural body until we are well persuaded that its formation would materially assist a deserving class of young men, and that its powers and status would be sufficient to enable it to fulfil its objects. We are not at liberty, for the present, to disclose certain suggestions that have been, quite tentatively, made to us; but when we have had time to investigate them thoroughly we shall be in a position to make a further statement. Meanwhile, those assistants who desire to join such a guild might communicate with us or with Mr. Dixon, so that it may be known what measure of support is likely to be accorded to the new venture if it should ever be launched.

Red Ruin and a Moral.

The last days of the year have witnessed in Southern Italy one of those terrible catastrophes that periodically befall the hapless peoples who inhabit the geologically youthful portions of the earth's crust. So immense is the disaster, and so widespread the ruin, that it is impossible to comprehend a havoc that destroys whole towns and takes toll of humanity to the extent of 200,000 souls in a few moments of time. But as out of all great evil some good does come, it is to be hoped that the rebuilding of these towns, if rebuilt they are to be, will show some fruits of modern experience in building operations. The lesson of San Francisco has led to the rebuilding of much of Kingstown, Jamaica, in reinforced concrete; and if the newest construction is not proof against the most violent convulsions of the earth, it cannot, like the older forms of construction, be shaken into the original bricks by shocks of moderate severity. Building in earthquake zones must be carried out on lines which experience has shown to give the most probable chances of safety to the inhabitants. The extensive use of reinforced concrete which the Italians have already made leads one to hope that if Messina and Reggio are once more to rise, they will be reinforced concrete cities with comparatively low buildings.

"APPLICATIONS" UNDER THE LONDON BUILDING ACTS.

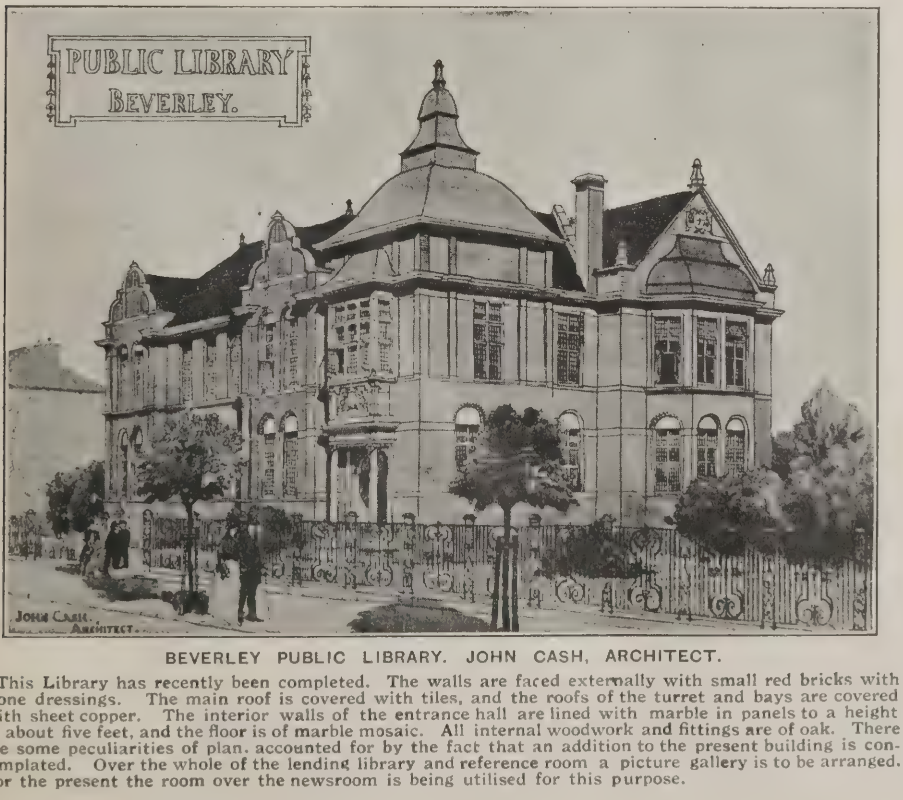
By B. Wyand.

"I would call attention to a most objectionable clause in the Bill—'the Council may permit.' The whole Bill bristles with permissions to avoid every clause in it." Thus wrote the late Professor Banister Fletcher in his book on the London Building Act, 1894. It was the fortune of Professor Fletcher to play several parts in professional life. Rarely are men given the opportunities, or endowed with such versatile talents as to be able to occupy the posts of professor of architecture and district surveyor, and at the same time to carry on a considerable private practice, and to make for themselves a reputation of no mean order in technical literature. The opinions of men are necessarily coloured to some extent by their callings or professions, and in this particular case the late professor wrote rather from the point of view of the district surveyor than from that of the practising architect. Then, again, it must be remembered that the above-quoted words were written shortly after the passing of the Act, and before the effect of the working had been able to be realised. After the lapse of nearly fourteen years there will be found few who will not admit that those provisions of the London Building Act which admit of variations from the strict letter of the law, conditional upon the consent by the County Council, do contribute to a more satisfactory state than would be attained if all the provisions were of an invariable cast-iron pattern. Cases are of frequent occurrence where both private owners and the general public are benefited by the existence of a give-and-take policy rendered possible by the permissive section of the Building Act, although equally, as will be shown later, there are cases where the powers of unconditional refusal possessed by the Council tend to the infliction of an unfair burden upon the property owner and the architect.

Those who have to carry out building work in London will doubtless be interested in the following references to the sections which admit of deviations by consent from the strict letter, and to the methods in which the County Council require applications under these sections to be made. Further, it may be possible, looking at the matter from the standpoint of practising architects, to enunciate what appear to be a few of the main principles governing the issuing of consents or refusals. Individual readers, by also noting their own experience in connection with the success or otherwise of applications, may thus be able to formulate a few rough rules for their own guidance and that of their clients.

A very useful leaflet, reference to which is in most cases necessary in making an application, may be obtained at the offices of the County Council. This contains the regulations, rules, and standing orders as to applications for consents, licences, etc., under the London Building Acts, 1894 and 1898, approved by the Council in November, 1904, in substitution for those previously in force. In this there are given the heads of the sections of the Acts of 1894 and 1898, under which the consent of the Council to variations can be obtained. The drawings required under each particular section are stated, and there is also a reference to the form of application to be observed. All applications must be addressed to the Superintending Architect, County Hall, Spring Gardens, S.W., with the one exception of applications relative to the erection of a dwelling house, or the adapting of buildings to form a dwelling-house on low-lying land. Such an application, made under Part xi. of the Act of 1894, must be addressed to the Clerk of the Council.

All applications are required to be in writing on foolscap paper, and all drawings to be in duplicate, on tracing cloth of a sufficient size to admit of the approval of the Council being endorsed thereon, and are to be drawn on the unglazed side of the tracing cloth. A north point and an actual scale, not merely an indicatory note, must be drawn on every plan. These latter requirements may appear but the elements of geometrical drawing in the eyes of competent draughtsmen, but as there is a possibility of private owners executing their own "drawings," no doubt the announcement of these few rules prevents in some cases their wholesale violation. Possibly, too, those responsible for the drafting of the regulations have already suffered at the hands of the amateur draughtsman. The regulations require a general colour scheme to be adopted. The site must be coloured pink, the proposed building red, existing buildings grey, and blue colour must be used to distinguish any land which may be proposed to be dedicated and left open for the use of the public. Particulars are required as to the nature of the application, the situation and proposed use of the new building, and the nature of the owner's interest—freehold, copyhold, or leasehold—in the property. Such are the official requirements, but it will be to the advantage of an applicant to bear in mind that it is not the slavish following of a set of regulations, but the submission of an application accompanied by clear and definite drawings which will best further the interests of his client. Some architects imbued with a lofty scorn of all restrictions so lost in the contemplation of Art with a big A, as to be unable to obtain a reasonable grip of an Act of Parliament, may, figuratively speaking, sling their applications at the head of the responsible authorities and leave it to the officials to find out exactly what is being applied for. Such applicants often have their reward in the receipt of an official refusal instead of the desired consent, which might have been obtained if a little tact had been shown and the strong points in favour of the application been given due prominence.



BEVERLEY PUBLIC LIBRARY. JOHN CASH, ARCHITECT.

This Library has recently been completed. The walls are faced externally with small red bricks with stone dressings. The main roof is covered with tiles, and the roofs of the turret and bays are covered with sheet copper. The interior walls of the entrance hall are lined with marble in panels to a height of about five feet, and the floor is of marble mosaic. All internal woodwork and fittings are of oak. There are some peculiarities of plan, accounted for by the fact that an addition to the present building is contemplated. Over the whole of the lending library and reference room a picture gallery is to be arranged. For the present the room over the newsroom is being utilised for this purpose.

Care is necessary to be taken both in the drafting of the application and in the preparation of the necessary drawings. In the letter of application the points in favour of the request should be briefly summarised, and it should be recollected that the public authority necessarily have to consider whether any public disadvantage is likely to be occasioned at the present or at any future time. If it can be argued that the proposed variation from the strict legal building rights will make for the public good, this should be stated in the application in no uncertain manner. Then again, most public bodies are influenced considerably by precedent, and thus if it can be shown that Smith or Jones next door, over the road, or in the immediate locality, has actually carried out work on similar lines to that for which permission is required, a useful point in favour of consent is at once made. The positions of such erections or works should, of course, be shown on the drawings. These should be clear and easily understood, and nothing more should be shown than is necessary properly to explain the applicaton. Superfluous matter may make the drawings look "busy," but it will confuse the point at issue, and may cause unnecessary questions to be raised. Such little absences of method, as that of putting the block plan a different way round from the larger scale drawing, should be studiously avoided; the preparation of a drawing to be understood at a glance should be aimed at.

Section 7 of the London Building Act, 1894, states that before any person commences to lay out a street either for carriage traffic or foot traffic an application must be made to the Council for their sanction. Section 10 of the same Act states that the Council's sanction must also be obtained before any person commences to adapt for carriage traffic a street or way not so adapted. or to adapt as a street for foot traffic or as a public foot way any way not previously so adapted. Thus, speaking in broad terms, the consent of the Council is necessary before the carrying out of any roadwork, and in applying for such consent the owner has the option of desiring some of the usual conditions to be waived. In the case of the forming of a new street, plans and sections drawn to the required scales must be submitted; applications made under Section 10 must also be accompanied by plans. Particulars in writing must be given of the control over the land forming the site of the new street possessed by the person on whose behalf the application is made, and the Council may require this to be verified by the production of the title deeds. Those acquainted with the Building Act of 1894 will remember that within two months after the receipt of an application under either of the two above-mentioned sections, the Council must either sanction or approve the application, otherwise they shall be deemed to have given their sanction. This clause is presumably intended to prevent undue delay in issuing a consent, but it is not uncommon for the professional man to receive, a day or two prior to the expiration of the two months, a request for further particulars, accompanied by a formal rejection of the plans.

Sections 9 and 11 contain a list of the cases in which alone the Council may refuse their sanction, and these, in fact, constitute the official requirements. The ordinary requirements of a width of 40 feet for carriage traffic streets is not likely to be desired to be varied, in fact it is hardly likely that any such application would receive much consideration. The limit of width of 20 feet for foot traffic streets and the limit of gradient of 1 in 20 for carriage traffic streets, may in some cases be considered too stringent by the owner. The circumstances of the case are likely to have considerable influence upon the result of an application in which these requirements are desired to be relaxed. Probably the requirement which more seriously affects property owners is that which demands that except in the City a new street must form direct communication between two streets. Crescent roads with but two entrances are thus barred, and it is a matter of considerable doubt whether this requirement is likely to be relaxed in any ordinary case. It is noteworthy that in this part of the Act of 1894 (Part II.) there is the right under Section 19 of appeal to the Tribunal of Appeal. The last-mentioned case in Sections 9 and 11, under which the Council may refuse sanction, is that in which the forming or adapting of a street any by-law of the Council is contravened. The by-law relative to the formation of new streets in the Metropolis made by the Metropolitan Board of Works in 1857 should thus be referred to. It is in many parts reenacted by the Building Act in 1894, but the cross fall of the roadway, height of curb, and slope of footway, are governed by this by-law.

(*To be concluded.*)

Coventry.—Two schemes for a proposed town hall for Coventry have been prepared by the city engineer, and are now under consideration by the town council.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Mar. 17	NEW OFFICES FOR THE STANLEY U.D.C., DURHAM. Cost £3,500. Premiums £30, £20 and £10. Conditions, etc., to be obtained from J. G. Ridley, Clerk to the Council. Stanley S,O., Co. Durham.
No date.	*SOUTH BANK - IN - NORMANBY. Town Hall, Council Offices, etc., for the Urban District Council.
No date.	SWINTON. New Schools in Cromwell Road for the Swinton and Pendlebury U.D.C. Limited to Architects having offices within ten miles of Manchester. Premiums of £50,£25, and £10. Instructions may be obtained by letter on or before November 5th, to W.T.Postlethwaite, Council Offices, Swinton, Manchester.
No date.	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days.

**The R.I.B.A. Council has requested Members to refrain from competing.*

Bury Secondary School Competition.

The assessor in this competition, Mr. J. W. Simpson, vice-president and fellow of the Royal Institute of British Architects, has completed his assessment, and the whole of the plans submitted, both premiated and unpremiated, were exhibited at the Technical School, Broad Street, Bury, on Saturday, January 2nd, from 2 to 8 p.m.; and from 10 a.m. to 8 p.m. on Monday and Tuesday, January 4th and 5th, 1909. The premiated designs are as follows:—

First, Mr. T. Thomas Halliday, A.R.I.B.A. of Stockport;

Second, Messrs. Castle and Warren, of London;

Third, Messrs. Appleyard and Quiggan, of Liverpool

There were 141 designs submitted. The premiated designs, with a criticism, will appear in our issue of next week.

* * *

Primitive Methodist Church and Schools, Gateshead.

The result of a limited competition for a new Primitive Methodist Church and Schools, Low Fell, Gateshead, has been made known, and the plans submitted by Messrs. Marshall and Tweedy, 17, Eldon Square, Newcastle, have been selected. The church will accommodate 600, and the school 350; there are nine class rooms and six vestries. The cost will be about £5,000.

* * *

Blackpool Library Competition.

Over 100 sets of drawings have been received for the above. Mr. G. H. Willoughby, of Manchester, is the assessor.

Shakespeare Memorial Committee.—This Committee has been engaged during the autumn in drafting a scheme for a National Theatre, and two sub-committees, one under the chairmanship of Lord Esher and the other under that of Lord Lytton, have been holding weekly meetings. The executive committee consists of the Lord Mayor of London (chairman), Lord Plymouth, Lord Lytton, Lord Esher, the Hon. Mrs. Alfred Lyttelton, Sir John Hare, Mr. William Archer, Mr. H. Granville Barker, Mr. S. H. Butcher, M.P., Mr. J. Comyns Carr, Mr. Sidney Colvin, Mr. W. L. Courtney, Mr. Robert Donald, Dr. F. J. Furnivall, Mrs. G. L. Gomme, Mr. Edmund Gosse, Mr. Sidney Lee, Mr. Sidney Low, Mr. H. W. Massingham, Mr. A. W. Pinero, Mr. J. Forbes Robertson, Mr. G. Bernard Shaw, Mr. H. Beerbohm Tree, Professor I. Gollancz (hon. secretary), and Mr. Philip Carr (secretary).

Our Plate.

House at West Didsbury, near Manchester.

This is a rough-cast house, [illegible] hand-made red sand weathering tiles, with hand-made sand-faced brick quoins. Inside the hall is paved with coloured Italian marbles in large squares. The ceilings of the drawing-room and the hall have dark oak beams, taken from an old cottage recently demolished in the district. A special feature of the sanitary arrangements has been the provision of lavatory basins with hot and cold water supply in every bedroom. The contractors were Messrs. Peace and Norquoy, of Manchester, and the architects are Messrs. Fair and Myer, A.R.I.B.A., of Furnival Street, London.

Obituary.

Mr. William Milner Fawcett, F.R.I.B.A., the Cambridge architect, died somewhat unexpectedly at his residence at Cambridge on Sunday week. He was born near Leeds in 1832, the third son of the Rev. James Fawcett, vicar of Knaresborough, and was educated at Leeds Grammar School and Jesus College, Cambridge. He began practice as an architect at Cambridge in 1859. He obtained his F.R.I.B.A. in 1866, was member of council from 1871 to 1873 and from 1884 to 1889, and was vice-president from 1896 to 1900. He was at one time county surveyor for Cambridgeshire, and diocesan surveyor for the diocese of Ely. He designed the Cavendish Laboratory, additions and alterations to King's, Queens', Emmanuel, Peterhouse, and other colleges, the training college for women at Cambridge, additions to Addenbrooke's Hospital, and several county mansions. He also supervised the building or restoration of about fifty churches. He was a pioneer of the Volunteer movement, and held the V.D.

* * *

Mr. Edward Augustus Gruning, F.R.B.A., who died recently after a few days' illness, had practised as architect and surveyor in the City of London for more than forty years, and had built many banks, insurance offices, and mercantile houses. He was also the architect of De Keyser's Royal Hotel, Blackfriars. Besides being a Fellow and past Vice-President of the R.I.B.A., he was a Fellow of the Surveyors' Institution, and a member of the Tribunal of Appeal under the London Building Acts. He was born on June 26th, 1837.

Correspondence.

Khartoum Cathedral.

To the Editor of THE BUILDERS' JOURNAL.

Sir,—Your somewhat facetious note on Khartoum Cathedral in your issue of December 23rd seems to have been prepared without any knowledge either of the nature of the building or of the local conditions. As a matter of fact, stone is the best natural material available, as there is practically an unlimited supply within 25 miles of the city. The quarries are close to the banks of the White Nile, and the stone is conveyed direct by water to the city. As your mis-statement is bound to create an erroneous impression, I shall be obliged if, only out of common fairness, you will correct it in your next issue.

ROBT. WEIR SCHULTZ.

[We trust that, since the "facetiousness" scarcely touched either the cathedral or its architect, and was mainly aimed at the extremists who are so insistent for the pure "indigenousness" of buildings, the season may afford sufficient excuse for it. Alternatively, we may plead that it has had an excellent effect in drawing this authoritative information from Mr. Weir Schultz, for whose interesting communication we are greatly indebted.—ED.]

Compensation to Workmen.

To the Editor of THE BUILDERS' JOURNAL.

Sir,—The position of the employer under the Workmen's Compensation Act is extremely burdensome. The premiums he has to pay for insurance show a tendency to increase, owing, it is feared, to the unscrupulous way in which workmen take every possible advantage of the Act.

A case in point that has come under my notice may be usefully cited as a warning to employers not to settle claims informally or privately. A man whose claim was thus settled, and who at the time of settlement expressed his satisfaction and gratitude, has now refused to ratify the agreement, and the employer finds that it is necessary for settlements to be filed at Court.

A WELSH BUILDER.

Glamorgan County Hall.

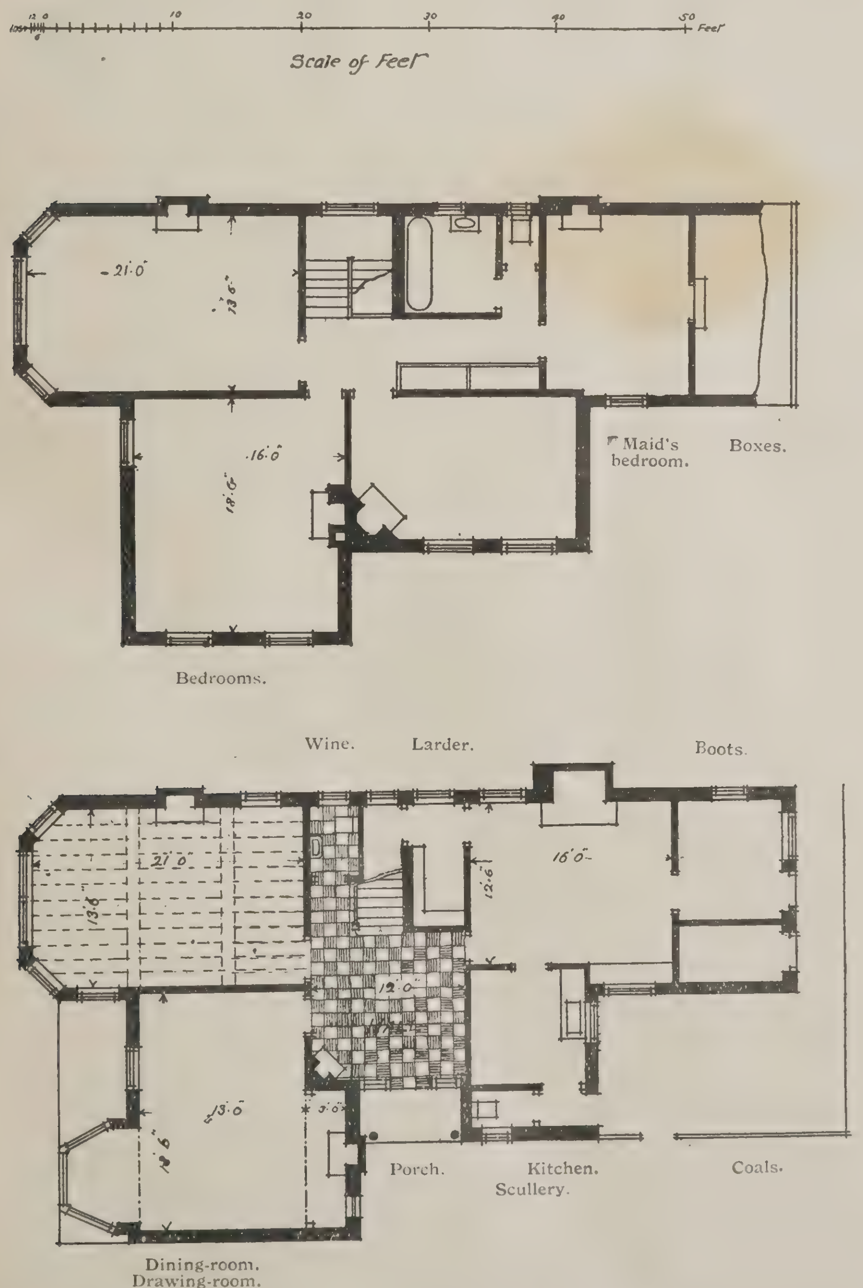
To the Editor of THE BUILDERS' JOURNAL.

Dear Sir,—I have read your report on the above competition, and feel sure that on mature consideration you will see that it is altogether too tame. This was a competition under almost ideal conditions, on one of the finest sites in the British Isles, next door one of the, if not the, finest modern buildings (by modern I mean erected within the last twenty years).

It was perfectly well known that all or nearly all the architects who do municipal work were in for it, and it was hoped that the result might be that the best man would win.

What is the result? A design has been placed first which, if it has any merit, is entirely in the plan. The chief part of the exterior is a Corinthian colonnade, which has no kind of relation to the plan. It might stand a dozen yards in front of the building or it might be left out altogether; it has no relation to the door or window openings, and they have none to it.

Your reviewer says it is all very strictly pure and correct and "rather severe." I doubt if any of it except the columns and entablature, which are, of course, "lifted" out of an order book, is correct. The windows and door openings are far too varied in size, the half-circular ones hopelessly overrun their supporters beneath, and the position of the pedimented windows half-way up the column is, to say the least, uncomfortable.



HOUSE AT DIDSBURY, NEAR MANCHESTER. FAIR AND MYER, A.R.I.B.A., ARCHITECTS.

Compare the details of this front with the measured drawing of the Antico Posta at Vicenza which recently appeared in the "Builders' Journal," or with the fronts of Easton Neston which recently appeared in "Country Life."

The absence of a pedestal or base would be enough alone to damn the design. Try to think what St. Martin's-in-the-Fields Church would look like with all but one of its steps removed. When one sees the building in any way except dead in front, the hollowness and sham of the scheme is at once apparent; the screening order does not return even an appreciable distance, and the front is, as you may say, Queen Anne and the rest Mary Anne.

The pedestals above the attic or parapet will be too heavy when the roof is not seen, as it will not be, and again too thin through; they should return at least as far on the sides as their width on front. The square parapet over projecting wings of front is too deep, and would be better if the base mould went right round, that is, the main faces should not be directly over the line of pilasters, but rather inside them. This would do away with the necessity of the paper-weights above.

This competition, coming on the top of the London County Hall competition, should convince even the most hardened gamblers of the utter futility of competitions as at present conducted.

That the best design has not been placed first, second, or third is a certainty. The competition is simply a gamble in which the competitor also happens to hit the assessor's idea of planning. The man who knows whether the assessor approves of a good lay-out or of the most cramped "economical plan," or what stage of compromise between the two he wants, has the competition won before he starts.

Architecture has nothing to do with the award. An assistant who has been employed in the petty details of municipal planning, such as how far the sanitary arrangements should be from the council chamber, or how many things that have not been specified in the original conditions are likely to be wanted, has a thousand to one better chance than Palladio or Wren himself would have in such a competition.

Finally, let me appeal to the architects or to the County of Glamorgan, or whoever is responsible for the erection of the building, not to erect it as it is at present designed, but to inquire into the available examples of classic architecture, especially those in Dublin, Paris, Vicenza, or whereever else they are to be found, and particularly to compare their cornice heights and levels with the neighbouring building; and if, as seems likely, it is impossible to put steps, to turn their columns into pilasters and put a pedestal base to them.

I have purposely refrained from being sarcastic or funny at the expense of architects with whose previous works I am unacquainted, and who, from all internal evidence there is in the design, may be beginners. There is a greater matter at stake, that is, that almost the only fine new building in the country shall not be spoiled by an unsuitable and even unscholarly neighbour.

NOT A COMPETITOR.

The Proposed Guild of Architects' Assistants.

SIR,—The corresondence in a previous issue in relation to this matter contains a few observations which I believe to be in error and to need elucidation. Your correspondent "Architect" begins by admitting the truth of the principal contentions in my article of December 2nd, and then proceeds to damn the suggestion of a Guild by reference to the ability of the Architectural Association to undertake the work; a reference to "quasi-tradeunion methods," and a warning to all having insufficient connection and capital not to enter the profession. I trust the reference to "quasi-trade-union methods" will not deter anyone from coming forward to support the formation of a Guild. All the questions to be considered by a Guild, and any measures taken to alleviate the lot of its members, would naturally be analogous to those taken by the mediæval organisations. I can only regard the reference to "quasi-trade-union methods" as either unfortunate or unfair to the matter at issue.

The Architectural Association is definitely engaged in the work of education, and whatever else is done by it must in the nature of things be mere by-play. It is formed principally of those who are actually in practice, or have a practice in view, or who are still in the grip of the delusion that a practice is *sure* to come if you look for it. It cannot, therefore, be deeply interested in the questions that a Guild formed for the purpose can alone adequately consider. In addition to this, we have the natural difficulty of adapting any existing organisation for the consideration of ideas quite foreign to its *raison d'être*. Prejudices exist in various quarters of the profession against each or all of the present institutions. I infer from these facts the necessity for a new organisation, a Guild, in which the various existing societies are properly and officially represented, together with all other professional interests, for the consideration and settlement of the new problems which are arising in consequence of the gradual isolation of the interests of the assistant from those of the principal.

"Architect's" warning to those of insufficient capital and connection not to enter the profession is echoed by every profession and business carried on at the present day. We have also the grave difficulty of finding employment at all. Under the present conditions, therefore, such a warning is sure to fall on deaf ears.

The insistance of the maintenance of the existing ratio between the fees of the principal and the salary of the assistant must be met by the consideration as to whether the assistant is justified in making any demand for decreasing that ratio—whether it should be, say, 3½ to 1, instead of about 4 to 1, to put the case very mildly. The inclusion of sympathetic principals in the Guild means the inclusion of those whose first thought is architecture and the well being of the assistant, and profit afterwards. These are the men we must have to help us, and I feel quite certain that such assistance will be readily given.

The dismal outlook of the middle-aged applies equally to other businesses and professions among the salaried or wage-earning class, and the prospect of employment is exceedingly remote, but we cannot help being middle-aged, and we must do something to ameliorate the condition of the middle-aged, and the only manner of doing so is by combination.

It is quite as painful to assistants to see really capable men working at a salary of 30s. or two guineas per week as it is to all members of the profession to hear of principals touting for work and undercutting their colleagues in the matter of fees.

I have a scheme for the flotation of such a Guild as I have described in my article on the subject, and I have heard a great deal of talk, but found it very difficult to bring together, voluntarily, a sufficient number to hold a conference on the matter. I believe now that I have succeeded. I am not aware that "Assistant" (whose letter I am pleased to see) has replied to my invitation of October last in this journal.

I should be pleased to hear from him, and from any others interested, including "Architect," as I propose holding a meeting next month to consider the question of the formation of a Guild and a scheme of unemployed insurance. The Council of the Architectural Association and a few well-known architects have expressed their sympathy to me in the matter of a system of unemployed insurance, and that matter, I am certain, not only involves a Guild, but can only be satisfactorily dealt with by means of it.

The formation of a Guild necessitates advertisement, and our enthusiastic friend "Assistant" has detailed such a procedure, but at the same time much local information must be obtained from those willing to act as local agents of the movement, and also to ensure our advertisement being placed in the best quarters.

E. J. DIXON, A.R.I.B.A.
60, Idmiston Road, Stratford, E.

To the Editor of THE BUILDERS' JOURNAL.

Sir,—I have read with considerable interest the letter by Mr. Dixon in your issue of December 2nd, and also the letter signed "Assistant," in your issue of December 16th.

The latter was especially interesting, putting forward, as it did, what, to my mind, were very practical and sensible suggestions.

The formation of a Guild seems to be an excellent way of carrying this into effect. As has been very truly pointed out, the assistants' interests are not diametrically opposed to those of the principals, although in a good many ways they are not exactly identical. A Guild run by architectural assistants would be of great benefit to assistants where their interests clash with the principals', as in the matter of salary, for instance; but it would also, by inviting the co-operation of the principals, be of great benefit to the profession generally.

History proves that combination is strength. The profession of architecture suffers under many disabilities compared to other learned professions. For instance, there is no such thing as a University degree for architects, as there is for barristers, medical men, literary men, schoolmasters, etc. I think there ought to be, and no man ought to be allowed to practise unless he has got it. This would weed out the incompetent and uneducated, and leave more room for those who are properly fitted and trained for the profession. There is no doubt that the profession is overcrowded, and some such weeding out process is necessary for its welfare and for the furthering of its ideals.

As an assistant, I am naturally, at present, most interested in the welfare of assistants, and, as such, heartily concur with the proposals of "Assistant" as to the preliminary steps towards the formation of the Guild. I should be much pleased to join the proposed committee, and will readily volunteer to contribute a few shillings towards the preliminary expenses.

As to the appointment of a secretary pro tem., I propose that anyone who is willing to undertake the duties should volunteer to do so. A choice could then be made by those who are interested, from among the volunteers. Without wishing in any way to push myself forward, I should be willing to act in that capacity were I selected.

Of course, when the Guild gets into working order, a paid secretary will be necessary who will devote all his time to the work.

In conclusion, I wish to congratulate Mr. Dixon on having brought this subject into such prominence, and "Assistant" for his valuable suggestions, and trust that this movement will soon result in the establishment of a useful and powerful institution.

LAURENCE A. JARVIS.

Notes and News.

We are informed that His Majesty the King has been graciously pleased to accept a copy of Mr. Geo. P. Bankart's new book entitled "The Art of the Plasterer," which has been recently published by Mr. B. T. Batsford, price 25s. net.

* * *

The Royal Commission on Coast Erosion have finished the special report which the Government asked them to make on the possible value of afforestation in helping to solve the problem of unemployment. The conclusion unanimously arrived at is that extensive works of afforestation would be to the public interest, both as a safeguard against the threatened paper famine, and as a means of finding useful employment for many persons. The Commissioners do not consider, however, that any great and speedy relief of distress would be obtained from this source. Operations could only be developed gradually, and even after many years would not engage the energies of more than 18,000 men. This, indeed, would be the result of the development at the rate of 150,000 acres per annum of the nine millions of acres deemed suitable for afforestation in the United Kingdom. Work would probably be undertaken on a smaller scale.

* * *

Mr. John Greenwood, of Overstrand, Mansfield, retired builder and contractor, who died on September 26th last, left estate of the gross value of £31,430, and among his numerous bequests he left six houses in Chaucer Street, Mansfield, to his sons, as trustees, upon trust for use as almshouses for the benefit of deserving aged or infirm persons, in Mansfield, connected with the building trade. The trustees have power to make a small charge to the inmates to cover the expenses of maintenance of the buildings, etc.

* * *

December 22nd was the closing date for tenders for the construction of the naval base at Rosyth. Tenders were invited for enclosed docks, quays, and sea wall, and twenty firms responded, four being from Glasgow. The computed cost is between three and four millions sterling. Work will begin in February.

* * *

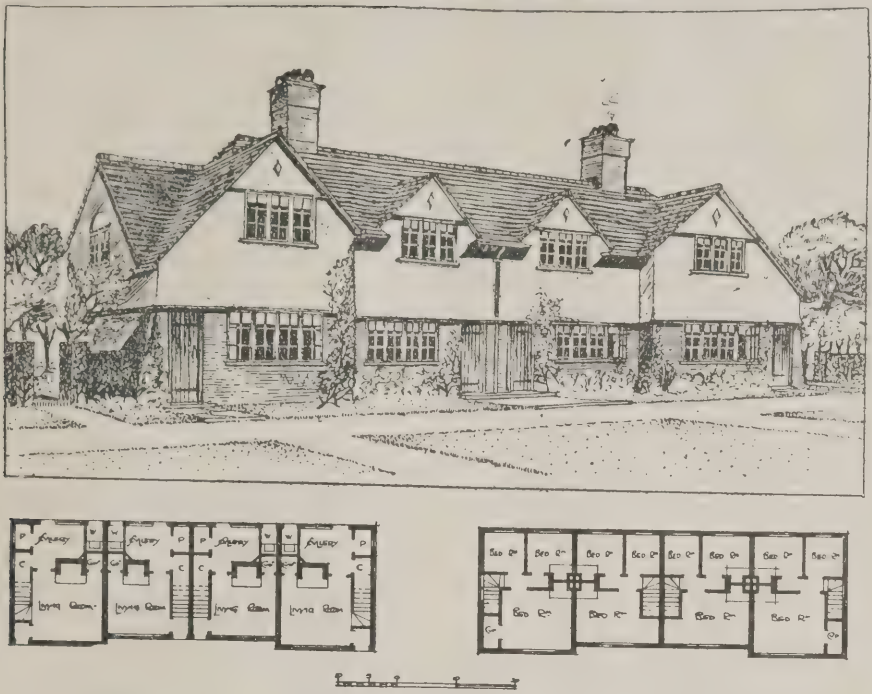
Mr. Birnie Rhind, R.S.A., Edinburgh, has been commissioned to produce a memorial in Melbourne to the late Marquis of Linlithgow, who was the first Governor-General of the Commonwealth of Australia. The memorial is to consist of a bronze statue, and is to occupy a conspicuous position in front of the Government Buildings. It will show the marquis in his uniform, and on horseback. Mr. Rhind executed the statue in Adelaide of the founder of that city, Colonel Light.

* * *

A memorial to the late Dr. Richard Lewis, bishop of Llandaff, which has been recently unveiled in Llandaff Cathedral, by Lord Tredegar, consists of a life-size figure in bright bronze, representing the late bishop in the act of benediction. Mr. W. Goscombe John, A.R.A., who executed the monument to Dean Vaughan in the same cathedral, is the sculptor.

* * *

Simplex Conduits, Ltd., whose head office and works are at Garrison Lane, Birmingham, and whose London showrooms and stores are at 113-117, Charing Cross Road, W.C., have issued a handsome leather-bound pocket diary in hich a brief price list of their conduits and fittings, wires and cables, electrical accessories, etc., is included as unobtrusively as, and, in the special circumstances, much more usefully than, the information that is found in an ordinary diary. The value of the diary to the professional man is greatly enhanced by the ruling in squares. The diary represents an excellent idea, tastefully embodied.



DESIGN FOR A ROW OF COTTAGES. T. G. SMITH, ARCHITECT.

Law Case.

Plasterers' Union Case on Appeal.

In the Court of Appeal, on December 21st, judgment was delivered by Lords Justices Vaughan Williams, Buckley, and Kennedy, in the case of Smithies v. The National Association of Operative Plasterers and others, which was an application by the plaintiff for judgment or a new trial in a case that had been tried by the Lord Chief Justice. The plaintiff, William Smithies, master plasterer, of Birmingham, had sued the National Association of Operative Plasterers; Michael Deler (now dead), general secretary of the Association; H. Duckett, secretary of the Birmingham branch; Stephen Wall, John Ponsford, and John Dear, trustees of the Association; and J. W. Forrester and W. H. Ecclesby, skilled plasterers and scagliola workers; claiming from all the defendants, except the two last named, damages for unlawfully and maliciously inducing and compelling workmen in the employment of the plaintiff to break their contracts and cease work. Forrester and Ecclesby were under contract for a term of years, and against these damages were claimed for breach of agreement. Defendants denied the allegations, pleading alternatively that the Association was not responsible, and that the plaintiff ended the contracts by employing a foreman named James Gibbs, who was obnoxious to the Association, and by refusing to refer his case to the conciliation board.

Plaintiff's claim for damages was made on the ground that on January 17th, 1905, nine or ten members of the union were called out to the detriment of his business. It appeared that Gibbs had been expelled from the Union before he was engaged by Smithies, who was not then aware that there had been any trouble. Soon after his engagement, however, the secretary of the Birmingham branch informed Smithies that Gibbs was a non-unionist. Eventually, as Gibbs was still kept on, the unionists were called out. The Lord Chief Justice awarded plaintiff £25 damages against each of the defendants Forrester and Ecclesby, who had broken their contracts, but held that damages could not be recovered from the Association.

In the present appeal from that judgment, Mr. Lush, K.C., and Mr. McCardie appeared for plaintiff; Mr. Simon, K.C., and Mr. Clement Edwards for the Association; and Mr. Shearman, K.C., and Mr. E. E. Wild for Duckett.

Mr. Lush submitted that, even if plaintiff had, as had been alleged, shown any intention of not abiding by the agreement, to which he was a signatory, between the employers and the union, that could not be a just cause for the union procuring the workmen to break their individual contracts with him; that plaintiff was no party to any alleged breach of the agreement; that the union were responsible for what the branch did in calling the men out, although the union may have had no such knowledge as the branch had with respect to the agreements—the knowledge of the branch must be imputed to the union; and that the union adopted what the branch had done, and kept the men out in breach of their contract. Mr. Lush contended that although the Lord Chief Justice had found that the union were justified in their action, no such justification had been made out. What was justification depended upon the circumstances of the particular case. The branch was a mandatory of the union, and the union therefore became responsible for the acts of the branch. The knowledge of the agent was the knowledge of the principal.

Mr. J. A. Simon contended that the object of a strike was not to procure breaches of contract, but to advise members of a trade union to cease work on giving proper notices. In the present case, the calling out of the men was not actionable, unless it could be shown that there had been some conspiracy on the part of the defendants. But, even if defendants did induce a breach of contract, justification of such an act was quite possible in law. Conspiring to bring about a cessation of work was not actionable unless the object was to injure somebody. The object of the defendants was not to bring about the dismissal of Gibbs, or to punish Gibbs in any way, but to enforce an arbitration clause, to bring about a conciliation meeting to determine whether Gibbs ought or ought not to be dismissed. The men who were induced to cease work were men who were entitled to the benefit of a bargain by which the plaintiff had agreed to raise no objection if they refused to work with defaulters. As to the charge of procuring breaches of contract, it was clear that when men were called out, the union knew nothing about the contracts for terms of years into which Forrester and Ecclesby had entered. The only evidence of ratification by the union of the action of the branch was the payment of strike money, and following the decision of the House of Lords in the Denaby and Cadeby miners' case, this was no ratification. Finally, the fact that plaintiff had failed to carry out the agreement to promote conciliation was justification for procuring breaches of contract.

Mr. Lush, in reply, admitted that the mere payment of strike money would not amount to ratification, but he contended that if the central body supported the action of the branch with knowledge of the facts, and showed their support by sanctioning strike pay, then they must be held to have ratified it.

Lord Justice Vaughan Williams, in delivering judgment, said that while the House of Lords had held that the branch officials were not, as such, officers or agents of the central body, yet, in his opinion, that decision in no way exonerates the central body from responsibility if the central body orders or authorises the branch officials to withdraw men wrongfully from their employment. He thought that the defendant union assisted in supporting the Birmingham branch in encouraging the scagliola men to stay away, although the union knew that this would be a breach of contract. He did not think that the honest belief that plaintiff was acting contrary to the masters' agreement would justify either the action of the Birmingham branch or the ratification by the union, if the union had knowledge of the term of the engagements of Forrester and Ecclesby. "It was urged before us," he continued, "that the judgment of Lord Collins is an authority for the proposition that you can excuse procuring a man to break his contract; and it was said that occasionally the court or a judge restrained a man from performing his contract. But, as Mr. Lush points out, these injunctions only go to restrain a contract which ought never to have been made. As to the knowledge of the defendant association on the day on which the men were called out, I have some doubt as to whether, for this purpose, the knowledge of the branch was the knowledge of the defendant association. . . I have to consider whether the fact that the branch was asking the union to sanction the strike, either makes the union and the branch stand in the relation of principal and agent, or in such relation that the duty to communicate would justify the imputation of the knowledge of the branch as the knowledge of the defendant association. I have grave doubts as to this. It is quite clear that the relation is not that of principal and agent. The case seems to be that, two bodies having a common object, the one engages with the other that he will not take a course which will in all probability throw an obligation to make money payments for maintenance on the other body, without the sanction of that other body. It is, of course, plain that the body asking for the sanction is bound to make full disclosure of all material facts, especially in a case in which the course for which sanction is asked is a course which, if taken without sufficient cause, may damage third persons, and possibly throw liabilities on both the body asking the sanction and the body giving its sanction. But the general position that, where a person asks sanction and it is given, the person giving it must have imputed to him all the knowledge of the petitioner seems too wide. Hitherto, I have only dealt with the case against the defendants other than Duckett. The case against Duckett depends on his knowledge of the scagliola contracts. He says that he did not know of these contracts, and the Lord Chief Justice has found that until January 17th he did not know. I do not see my way to differ from the Lord Chief Justice, who saw and heard the witness as to this question of fact.

Lord Justice Buckley read a judgment in which he arrived at the same conclusion, except that he was of opinion that the plaintiff was entitled to succeed not only against the defendant association but against Duckett as well.

Lord Justice Kennedy read a judgment agreeing with Lord Justice Vaughan Williams.

The appeal was allowed.

A discussion as to the form of the order followed.

Mr. Simon, K.C., said that although the defendants had contended that the damages, if any, could not exceed 40s., to save the expense of a new trial he would consent to judgment, with costs there and below, against the association, with £50 damages.

Mr. Duckett to have his costs paid by the plaintiff.

It was finally agreed that if the £50 was paid into court, and an appeal to the House of Lords set down within a month, the costs should remain untaxed until the decision was given by the final tribunal.

Views and Reviews.

Modern Scottish Domestic Architecture.*

We must confess to a feeling of disappointment with regard to the examples of domestic architecture shown in this book. No doubt they have been well chosen, as the architects whose works are represented are all men of high repute; and it is with the general effect rather than with particular examples that dissatisfaction arises. The book is no doubt faithful to fact in representing, in the net effect, Scottish architecture as being dour, dignified, and rather depressing. The editor, Mr. James Nicoll, remarks, in his very pithy introduction, that until recently "the house of the successful merchant bore a look of stodgy respectability." We thank Mr. Nicoll for teaching us that word. We fear that it could be applied without violent injustice to a large number of the the houses shown in the book. That, of course, is the fault of the cult, and not of the collector. One of Mr. Nicoll's remarks will give the enemy occasion to blaspheme. Commenting on the former general use of grey or brown stone and blue or purple slates, he adds the apology: "In fairness, however, it should be stated that, in the more northern districts at least, certain materials which had to be imported were not available, on account of the cost of transport. Fortunately this state of matters is fast disappearing, and in nearly every part of the country evidence of a feeling for design and good taste and an eye for colour in the selection of materials is noticeable." Surely this is to rejoice over conditions that, during the past summer, have caused weeping and wailing and gnashing of teeth among those to whom, architecturally, importation is vexation. But Mr. Nicoll is quite cognisant of the dangers of incongruity and promiscuousness. "Danger lies," he admits, "in the striving after originality at the expense of restraint and good design; while the builder who, lacking the necessary knowledge and discrimination, calmly lifts and combines in the most incongruous fashion what he considers the best 'bits' of other people's work, is still with us. He steps in where the ordinary architect almost fears to tread, and it matters not what his clients want—slates or tiles, half timber work, roughcast or massive masonry—he will provide them separately or together in the most obliging manner till many an 'eligible' building estate looks like an enlarged experiment in kindergarten. To such a man the qualities of breadth, mass, and repose are unknown quantities; and now that he has caught the trick—an offspring of *l'art nouveau*—of putting something 'quaint' and original into each house, we are in the way of receiving surprises." Mr. Nicoll, however, makes a very reasonable defence of the importation of materials. "In counties," he says, "where some particular production is obviously the readiest building material, it would be ridiculous to use an imported one, but it may be necessary and desirable to apply other materials along with it that may not be obtainable locally or even nationally. The granite district of North-East Scotland is a case in point. Granite, though most appropriate and beautiful in the case of a massive public building, is hard and unsatisfying as usually applied to ordinary domestic work, unless it is combined with some more or less 'foreign' substance. Used with green Westmorland slates or with red or brown Midland tiles, for instance, it acquires an added brilliance that would at first seem impossible." This contention should satisfy all but the extremists. Indeed, the introduction is wholly admirable, and constitutes an excellent *apologia* for Scottish architecture, and includes an interesting, not to say instructive, comparison between the respective methods and practices of North and South, as modified by the differences of habit, of climate, and of tradition. About thirty architects or firms are represented, and there are sixty-six plates of designs. The book, which is well produced and of very moderate price, will probably gain value by the lapse of time, because it happens to have caught Scottish domestic architecture as it were in the very act of transition, at the moment when it had to a great extent cast off the old traditions, but had not yet acquired any very definite new character. The value and interest of the book would have been considerably increased if it had been possible to give, in each case, the date of erection. We suggest also that the word "Modern" would have made the title more explicit.

*Domestic Architecture in Scotland. Illustrations of Scottish Domestic Work of Recent Years. Edited by James Nicoll. "Daily Journal" Offices, Aberdeen. 5s. net, stiff paper covers; 7s. 6d. net, cloth bound.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

The querist's name and address must always be given, not necessarily for publication.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s., made payable to Technical Journals Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

Crushing and Safe Loads on Reinforced Concrete Beams.

BURTON-ON-TRENT. — F.L. writes: "Will you be good enough to give me the crushing and safe loads per square inch on columns and beams in reinforced concrete work? Mixture:—4 gravel, 2 sand, 1 Portland cement; the ages of the concrete to be 1, 2, 3, 4, 5, 6, and 12 months."

The enquiry is too wide for us to answer in detail, for the crushing and safe loads on columns and beams in reinforced concrete work depend upon the size and proportion of reinforcement. If our correspondent wishes to study the subject of reinforced concrete design, we recommend him to obtain Messrs. Marsh and Dunn's book entitled "Reinforced Concrete" (31s. 6d.). A cheaper book is that of Mr. Twelvetrees, entitled "Concrete-Steel." There is also a brief summary of the subject in "Specification." If our correspondent studies enough of the subject to understand how to use the tables provided in Messrs. Marsh and Dunn's "Manual of Reinforced Concrete," price 7s. 6d., he will find ready means of ascertaining the information that he asks for, but we cannot provide him with this information in a form suitable for use by those unfamiliar with the subject. If he proposes using reinforced concrete in any building he designs, we recommend him to place the matter in the hands of a consulting engineer, or one of the specialist firms.

Draughtsmen's Sick Benefit Society.

PERTH.—A CONSTANT READER writes: (1) Is there any benefit society for draughtsmen, where by the payment of a sum weekly or monthly a person receives aliment during suckness? (2) If so, what are the addresses of same?"

We do not know of any benefit society specially formed for architects' assistants. Our correspondent may have noticed with the last few issues particulars of a project for a Guild of Architects which has this object mentioned among others in its purview. It would be quite possible, however, to obtain the benefits he mentions from any of the recognised societies, or sickness and accident insurance companies.

Works in Progress.

Barry.—The new accident hospital, which has been built at a cost of more than £6,600, contains twenty-one beds. The chief contractor is Mr. D. W. Davies, of Barry and Cardiff, and the design was prepared by Mr. J. C. Pardon, surveyor and architect to the corporation.

Bridlington.—The Local Government Board has sanctioned an expenditure of about £11,000 for the improvement of the water system and waterworks. For the necessary building work, the tender of Mr. F. Kneeshaw, of Bridlington (£2,505 17s. 9d.), has been recommended for acceptance.

Cardiff.—Plans for the proposed new St. John's Schools have been submitted to the Corporation. The demolition of the old schools will permit of a considerable street improvement.

Killingholme.—The church of St. Denys here is being repaired at a cost of about £400. The inside walls are being cleared of the old plaster, and the stonework will be pointed up to match that of the restored chancel. The roof of the nave is to be stripped, and a stained pitch-pine roof substituted. The work is in the hands of Messrs. G. Vickers and Co.

Oxford.—The foundations of the laboratory which is being given to the University of Oxford for electrical work by the Drapers' Company are now being constructed. The laboratory will measure about 104ft. by 92ft. by 51ft. high, and will be built of red brick and stone. It will be situated in the parks, close to the other buildings devoted to science, which are grouped around the museum. The ground floor will contain a class-room 50ft. by 27ft., a workshop of about the same dimensions, as well as research, battery, and dark rooms. On the first floor provision is made for a lecture-hall 36ft. square and two class-rooms over 50ft. long, while on the second floor there will be a class-room about 100ft. long, besides large lecture and research rooms. The building has been designed by Mr. T. G. Jackson, R.A.

Southport.—The scheme for street-widening in Lord Street seems likely to materialise. The portion of Christ Church churchyard which the corporation are endeavouring to acquire with this object, is now offered at £4 per square yard, the total cost being about £1,320.

Streetly.—The foundation stone has just been laid of All Saints' Church, which is to be built of brick, and will accommodate 500 people when complete, but only the south aisle, chapel, and baptistry are to be built at first, giving accommodation for about 200. The work is being carried out by Mr. W. Wistance, of Walsall, from the design of Mr. F. T. Beck, of Wolverhampton.

Swansea. — The Corporation have entered into contracts for the erection of 140 double and single tenements on the Baptist Well Estate. It is proposed that the corporation shall build twelve houses on Town Hill in connection with the forthcoming housing exhibition. Also a site for fifteen cottages is being acquired at Plasmarl; and there is a suggestion for another municipal building scheme on Trewyddfa Common.

Wrabness.—The parish church of Wrabness has just been re-opened after alterations and rebuilding that have cost about £1,000. An unsightly west gallery has been removed, the nave has been extended about 14 ft. westwards, and the fifteenth century roof has been in part reconstructed. A mean brick structure that stood on the site of the original fifteenth-century south porch, and served as a vestry, has been demolished, and the old south doorway has been opened out to its original dimensions, and restored to its original purpose as the main entrance to the church. A new vestry has been erected on the north side of the nave, and is approached through an original Norman doorway, which had been for many years disused. The nave has been re-floored with wood blocks, and the old box pews have been removed, open benches and chairs being substituted. The building works have been executed by Messrs. Sage and Cutting, of Wix, from the design and under the superintendence of Mr. W. J. Charles Bourne, of London.

Worthing.—The new public library here, the gift of Mr. Andrew Carnegie, and the new Museum and Art Gallery, adjoining, which have been presented to the town by an anonymous donor, have just been formally opened. The architect is Mr. H. A. Crouch, A.R.I.B.A.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

THE CONCRETE INSTITUTE.

Discussion on Mr. Dunn's Paper.

The following discussion ensued after Mr. Dunn's paper, at the second meeting, already reported in our issue of December 23rd.

Professor BERESFORD PITE, F.R.I.B.A., at the request of the Chairman, opened the discussion upon Mr. Dunn's paper. He must, he said, confess to not being a contractor, and therefore the practical suggestions which might be added to the discussion he was unable to make. He could only confess to a very great interest in the subject and to a keen appreciation of the practical nature of the paper which they had just heard read. That Mr. Dunn had been able to speak with considerable experience of the subject was recognised by all architects, and if one thing was wanted more than another it was not only contractors and foremen of experience, and clerks of works of experience, but architects and engineers of experience. He could not pretend to offer any suggestion of any value to the discussion, except perhaps the formal one of proposing a most cordial vote of thanks to Mr. Dunn on behalf of the meeting for his paper, but he would suggest to architects that the title of his paper was not exhaustive by any means. The examination of designs for ferro-concrete buildings suggested a great deal more to architects than the question of infiltration of sulphates through exterior conduits of similar construction, and questions as to the conduct of clerks of works and others. The designs that would have to be examined for ferro-concrete buildings presented, of course, a variety of topics, and he felt the very great importance of bestowing on the word "design" in connection with ferro-concrete some very special consideration. As one looked around in the history of the building arts, one noticed that there were periodical epochs when some providence of creation moved the builder with the building instinct. One of the most interesting things to note was that at the moment of the advent of a complete grasp of the properties of arched construction, the whole surface of design changed. The Pantheon at Rome, a masterpiece of engineering, as well as of architecture, seemed to be the product of some movement of the building instinct, and for the next 500 years the world was doming. It was not ferro-concrete, but arched construction in concrete fortified with brick. It held the Eastern world in a way which they had scarcely measured up to the present, and this method was left alone for a succeeding period of 500 years, when the Northern energy concerned itself with vaulting by light material strengthened with ribs of stone work, and during those five centuries developed in England, from St. John's at the Tower of London, where the vaulting was of the simplest description, to the vaulting of Henry VIII.'s Chapel, where they got the stone ribs fortifying the vaulting, to an extent which he suggested was not unlike the extent to which steel ribs fortified fero-concrete construction in their view at the present day. From the period of Henry VIII.'s Chapel until now no movement of this instinct had occurred. Iron had been introduced into our buildings to do the work of wood girders and brick and stone piers in a simpler, more economical, and probably more adaptable manner, but no revolution of the building art had ensued. He suggested to this Institute and meeting that the subject of ferro-concrete had brought them to such another crucial epoch, and that they were dealing with the verge of a revolution in building art similar to that which ensued in the East upon the advent of Roman concrete fortified with brick, and the mediæval methods of vaulting fortified with ribs. It was from that aspect, and from the aspect of an outsider, that he ventured to remark on the special interest of this question at the present time. Design in ferro-concrete was not altogether the complete novelty that it might suggest itself to be to the architect. It had means of expression in it, and there was as much force and virility to be expressed by the thin wall as strength and solidity to be expressed in the thick; and he would like to suggest that not only the Science Committee, but the Art Committee, might well give attention to the subject under the title of Mr. Dunn's paper. He had much pleasure in venturing to propose a vote of thanks to Mr. Dunn.

Tendering on Specialists' Designs.

Mr. R. W. VAWDREY said there was one point in Mr. Dunn's paper to which he should like to give special prominence. He said somewhere that he considered that the plan of inviting competitive tenders upon the designs of one or more firms had much to recommend it. It appeared to him that it was wise to avoid if possible the confusion of the design and the price when asking for competitive tenders. The matter was no doubt extremely difficult, and he was not prepared to suggest any exact remedy for it, but it did appear to him to be much better, when an engineer or architect was considering the construction of a reinforced concrete building, if in the first place he would settle his design; that was to say, that he would invite competitive tenders if he desired to do so from those who laid themselves out to prepare them—the specialist firms—and, having settled his design, obtain tenders from the contractors upon it. It appeared to him to be an extremely dangerous thing for the design, and the price at which that design could be carried out to be confused in the selection of the final tender. For instance, where competitive architectural designs were required for some public buildings, it was after the acceptance of the chosen design that tenders were asked for for its construction. Yet the most usual practice of the present day with regard to reinforced concrete work was to ask for competitive tenders upon competitive designs at the same time; i.e., a large number of firms might be tendering for the construction of a building or a bridge on different designs, and he considered that it was a most dangerous proceeding. There was another point, and that was the use of the word "system," which appeared to be continually cropping up. Was it not a mistake for so many firms to use the word "system" of designing reinforced concrete? It appeared to him that it was impossible to override the ordinary principles of mechanics in any reinforced concrete design, and the difference which might occur when designs were prepared by different firms of architects or engineers depended entirely on whether good practice or bad practice was shown in their designs. There was no difference in system; the designs were not prepared on different systems. All correct designs depended on the principles of ordinary mechanics, which could not be ignored. He must express his regret that Mr. Dunn should have stated that in this country a mishap would not be dealt with scientifically and investigated, the regret being the more sincere because it was probably true. Surely this Institute had been promoted to some extent for dealing with these questions scientifically, and he would suggest that, in any case of failure, if possible, a committee or some portion of the Institute should be appointed to investigate, if necessary more or less privately, into any important case of failure which occurred.

The Rules of the British Committee.

Mr. G. C. WORKMAN said that, as the representative of one of the oldest firms of specialists, he wished to thank Mr. Dunn for his paper. It was quite evident that at present there was a great tendency to specialise in all branches of science and industry, and he therefore thought Mr. Dunn was quite right in saying that both efficiency and economy were better served by consulting a specialist when a reliable scheme was required for work in concrete. Concerning the question of the choice of a proper design, he wished to say that it was very important that architects and engineers should know that unless the rules of the British Committee were applied it was quite possible that either the steel or the concrete in certain parts of the design might be stressed beyond the limits which had been specified. For that reason, he was of opinion that when competitive designs were required from various firms of specialists it was essential that the architect should state that the calculation must be based upon the rules of the British Committee, or that if any empirical rules were used, the specialist should be asked to certify that the limit of the stresses fixed by the British Committee had not been exceeded. The architect should check these figures or calculations to see that such was the case, for undoubtedly certain provisions or simplified methods adopted by some constructors, while giving correct results in some cases, did not give correct results in others. Finally, he wished to state that in his opinion the rules of the British Committee were quite reasonable and workable, and architects should specify their application in every case. With regard to Mr. Vawdrey's remarks, supposing any failure did occur in a work in reinforced concrete, who was going to see in a scientific manner the reasons for which such failure had occurred? What rules were going to decide and to fix the responsibilities? They all knew, of course, that the rules which had been put forward by the British Committee—so far as he knew, that was—had not been publicly accepted by everybody, but still he thought they, the engineers, ought to know what was going to determine the responsibility of the engineer in case of any failure, and he thought this Institute should take up the matter with a view to defining precisely what was going to happen in such a case.

Concerning Competitive Designs.

Mr. E. P. WELLS said that, in reference to the question of competitive designs asked for, he had always found that where several specialists or engineers had sent in designs on the same lines, and had adopted the same factors throughout, and where these quantities had been sent to contractors, there had been very little variation in the cost of the work, and he thought that variation was due primarily to the amount of profit added: but in some cases, where they found that designs had been tendered on and there was a difference of 33 1-3 per cent. between the highest and the lowest, they might be perfectly certain that there had been some serious error, and that the factors of what should be 4 to 1 were as low sometimes as nearly 2 to 1. He quite agreed that in all cases, when an architect or an engineer was asking for prices of reinforced concrete work, he should state what his factors were.

In some cases, in private buildings, it was perfectly safe for a cheap structure to work on 3 to 1 factors, because it was known that if even they asked for $\frac{3}{4}$-cwt. loading on an ordinary office floor, it was exceptional to get 25lbs., and in public schools, where they were asked for 3 cwt. per sq. ft. as the live load on the floor, the greatest amount they could get on it, by saying that each child weighed a cwt.—(laughter)—was 5lbs. per sq. ft. Some people did not know what they were asking for, and in all such cases there should be absolute tests, especially for paper warehouses, to load and to ascertain what the loads were before calling for competitive designs, because in some cases they were not stated, and the engineer had simply got to design his work on what he thought the load would be. He might think 4 cwts., another might think 3 cwts., and another 2 cwts. to the sq. ft.; the 2 cwts. got it, and it was a question of luck afterwards up to what it was loaded. With regard to the work that he designed himself, he might say that he never went beyond, in the South of England, 600lbs. per sq. in. in compression, and if he ran beyond that he made up the difference in steel. There was one cement he used that, where it was a case of necessity for going in for high stresses, he was working up to 2,000lbs. per sq. in., but that was a concrete which at 4 to 1 gave 600 tons per sq. ft. when 12 months old. Mr. Dunn had said that they always got better results from the tests of cubes than from the work in actual practice; but he disagreed with him there. He supposed he had made more crushing tests of concrete than anybody in that room, and he found that if they cut a cube of concrete out of concrete that had been put "en masse," or even to a larger size than the cube itself, they would get as a rule from 25 per cent to 50 per cent. greater crushing resistance than out of a small cube, owing to the fact that the moisture in the small cube evaporated rapidly as compared with concrete in large masses, and it was having that mass of moisture in the concrete which enabled the cement to gain in strength and also become very much denser, owing to the pores being filled up with the crystals of hydrate of lime. With regard to crushing and working concrete in compression, it was always absolutely safe to work up to 63 per cent. of its ultimate crushing without there being any sign of failure. In saying that, he must say it had been proved by experience, as he had had cubes under crushing machines for over ten days, and he had never found yet that if he loaded up to 63 per cent. he got any permanent set. If they had a good concrete made of Spurn gravel, they might take 75 per cent. of their ultimate, and they would be absolutely safe. He quite agreed with what had been said in reference to the complaints of the unnecessary loss entailed in calling for detailed drawings. He would not give a detailed drawing until the contractor was notified that his tender was accepted. The previous night he went over the amount of work that he had designed and provided quantities for up to the present time, and taking the commissions he had received in just on twelve months he found that it worked out at 0.16 of 1 per cent. of the whole of the works designed and quantities prepared for same. (Laughter.) If he had been compelled to give working drawings for all this work, it would have cost him about £6,000, which would very soon have landed him in the bankruptcy court. He did not think it fair for any architect to call upon a contractor for detailed drawings until the tender had been accepted, and then, if he investigated and found a deficiency of strength, having called for certain factors, the contractor must alter and comply with the conditions laid down. He also agreed with Mr. Dunn's remarks about the importance of the dead weight of a structure. This was very often overlooked, but it was one of the things when works were tested that were not taken into account, and it was one of the prime causes very often that when a beam was tested it broke, if the concrete was good, at very much more than the calculated allowance, and that was due entirely to the dead load being constant throughout, and only increasing the live load. With regard to Mr. Dunn's statement about gypsum in water, they did not come across it very often in England, but on the Continent it was very common, especially in the South of France. He had some reports sent to him a short time ago showing where tunnels and retaining walls had simply collapsed in twelve months, and in one case, where the water was taken afterwards from the site, and 3 to 1 briquettes were immersed in this water, in a little over a month they disintegrated. At Beeston, 50ft. down, they would get into water impregnated with gypsum to the extent of 14 grains to the gallon, which would very soon play mischief with concrete work, and that was due to a gypsum bank on the other side of the Trent on higher ground, and percolation taking place into lower levels. If that water was taken and pumped into a reservoir, they would have a collapse in a year or two.

Experience Gained from Failures.

Mr. H. K. BAMBER said the author of the paper had referred to the experience to be gained by failures, and in connection with that he mentioned the German iron ore cement, with which he did not claim to have had any special experience. As he (Mr. Bamber) knew something of that class of cement, it might be perhaps of some benefit if he said a word or two on that subject. There was a patent cement invented with a view to meeting the difficulty referred to, viz., the deterioration of Portland cement when in certain sea waters. The patentee's idea was to produce a cement with a raw material in order that the finished article might contain the smallest possible percentage of alumina. By using silica and iron ore the patentee had been able to produce such a cement, containing little less than 1 per cent. only of alumina, the ordinary percentage for British and German Portland cements being about 6 per cent. Members must not confuse the cement referred to by Mr. Dunn, this German iron ore cement, with the iron ore, or rather slag cements, which were prepared from the vitrified waste material for blast furnaces; there was a distinct difference between them, the difference being that whereas in iron ore cement there was a very small percentage of alumina, amounting, as he had said, to 6 per cent. or 7 per cent. only, in the case of the slag cements there was no less than 18 or 20 per cent. of alumina. It was strange that at this particular time the question of slag cements, which had for many years been before the engineer, was again somewhat to the fore. He would like to say, in connection with a remark made by Mr. Dunn, that in France and in Germany they particularly distinguished between cements required for land work and cements required for sea work, whereas in England such was not the case. He thought that to a certain extent Mr. Dunn was right, and that during the last few years the English manufacturer had brought himself to see that a distinction was required.

Testing for Strength.

Mr. W. G. PERKINS said he would confine himself to asking Mr. Dunn a question. He stated that the British rule for concrete in bending was to allow a maximum of 600lbs. per sq. in., and then he said that from experiments made with cubes in direct compression it was only safe to put 500lbs. He thought that was contrary to the general experience, that when a material was tested under transverse stress, it generally showed a higher co-efficient of strength than when under direct tension or compression. He believed the subject was first investigated by Barlow, who found that if they calculated the strength of a beam by using values obtained by direct testing that they did not get a true result, that the beam was very much stronger, and that he believed was corroborated by Sir Benjamin Baker.

Tenders and Pretenders.

Mr. J. MUNRO said that if an architect wanted his work properly done it seemed to him to be essential that he should go to those who made a practice of it, and did nothing else. In Edinburgh, where he came from, he knew of several builders who had styled themselves ferro-concrete specialists. They had seen firms—wild horses would not drag the names from him—doing work, and they had said to themselves, "This is a good thing." They saw steel put in, and they imagined that a bit here and a bit there would do all that was necessary; and they put it at the top of a floor instead of at the proper place. Small wonder if catastrophes happened. He would like to eliminate specialists of that description. He was at one with those speakers who had urged uniformity in tenders. He had a case in mind. He went in for a large contract in the Midlands, and as a matter of fact he got it, but only after a good deal of examination and introspection. Sixteen of them were invited—all sorts and conditions—and those sixteen all went on different lines, and in some cases the steel was stressed up to 13 and 14 tons in 1 sq. inch. When the matter was brought before the architect, he naturally considered afresh, and they were instructed to go on one common line, with the result that the whole thing was narrowed down to one or two. It just showed that architects ought to give a definite understanding of what they wished. In regard to preparing working drawings and details for tendering purposes, they had had quite enough of that, and he was not at all certain but that H.M. Board of Works was not about the biggest sinner in that respect.

About Hooped Concrete.

Mr. H. B. GATES said he had the honour to represent, more or less, Mons. Armand Considere. He noticed that Mr. Dunn had been kind enough to say something about hooped concrete, and that there was as yet much to be learned about the action of hooped concrete. But what Mr. Dunn said was quite contrary to Mons. Considere's experience. There was no more severe test for hooped concrete than to put a column into the form of a pile and hammer it, and if it was an efficient column and obeyed the laws which they supposed it to obey, he thought the stress developed by that hammering would show whether that column was efficient or not; his firm could show Mr. Dunn results in that respect which would demonstrate the full efficiency of the system to perfect satisfaction. As to checking calculations, Mr. Dunn said the deadweight of the structure was very important, and Mr. Wells had also remarked on the subject. They fully agreed that it was very necessary to allow for the dead load in making the test. The question of negative moments required every consideration, and he did not think the rules of the British Institute were always observed. With regard to the question of the right number of rods to be put in concrete work, which Mr. Dunn had also touched upon, there was a point which would be of assistance, and that was to use the method of construction or reinforcement in which all the reinforcing bars of a certain area were first placed completely in position, wired together in their proper places. If such a complete skeleton method was adopted, there would be no difficulty whatever in checking the members before the concrete was put in; they could pass the skeleton, and allow the concrete to be put in. He cordially agreed with Mr. Vawdrey in all his remarks concerning tenders for reinforced concrete work. It was highly desirable that engineers or architects should first settle their design and then invite contractors' tenders upon it. He thought the paragraph in Mr. Dunn's paper in which he confounded the design and the tender was somewhat obscure. The assumption in his paper was that there was only one price and contractor to each design, but generally there were four or five.

Bending Resistance.

Mr. CHAS. F. MARSH, M.I.C.E., referred to the compressive resistance of concrete in bending. It was well known, he said, that a cast-iron beam was very much stronger than if they calculated it on the assumption that it only had the same resistance as it had under direct compression.

"Coal Factor and Concrete Specialist."

The CHAIRMAN said the great point they had tried to arrive at out of the discussion was whether the contractors or the specialists would be satisfied if the architects and engineers were to always lay down in the simplest possible form that the R.I.B.A. conditions and regulations were to be kept to, and as far as he could hear there was not one serious complaint about anything in the R.I.B.A. conditions that did not meet with the views of the contractors present. That being the case, one could only advocate that engineers and architects should in the fewest possible words simply write at the top of their specifications of reinforced concrete that the conditions of the R.I.B.A. were to be kept to. They would thus safeguard themselves and the proprietors of the building. Mr. Munro brought out a point which he was glad he touched upon, and that was the influx of a number of so-called specialists. He had on his desk a letter which came to hand two days previously from a gentleman who described himself "coal factor and concrete specialist." It was only by architects and engineers protecting themselves by adopting some recognised formulæ for the designs, and also afterwards adopting some formulæ for the examination of the designs and supervision of the designs, just as they had special formulæ already for steel work, that they could hope to arrive at a general practice throughout the country which would give the members of the technical profession, and the contractors also, every satisfaction. There were several gentlemen who had referred to the amount of unnecessary work they were sometimes called upon to do when tendering, and he thought they were deserving of all sympathy. It was really quite ridiculous to see the trouble to which some specialist designers were put by members of the different professions who did not know exactly what they wanted, but they must always remember that they were dealing with an entirely new form of building construction so far as this country was concerned, and a certain experimental period must necessarily exist in the architects' office and in the engineer's office. Many an architect really did not know quite what he wanted beyond that he had heard that reinforced concrete was stated to be economical; he wished to adapt his design to that particular form of construction, and he experimented round it; but he thought that would right itself in a few years' time, as architects and engineers generally became more conversant with the various forms of reinforced concrete designs. (Applause.)

Mr. Dunn's Reply.

Mr. WM. DUNN, replying to the discussion, said he thought the discussion had been the most interesting part of the meeting. Mr. Gates spoke about the column invented by Mons. Considere, and questioned his statement that it suffered considerable change of form before the steel binding became effective. He had seen spirally reinforced columns tested, and he had noticed very considerable change of form. All scientific tests showed these, while he valued Mon. Considere's work very highly, he did not think they had arrived at such a good understanding as he hoped to see. He thought Mr. Bamber's remarks were most interesting, and they now looked for a better cement for use in sea water. Mr. Wells had spoken of putting heavy loads on his concrete. The Institute allowed a heavy stress to be put upon strong concrete, but when Mr. Wells assumed that 75 per cent. of the ultimate was a safe load, he was afraid he took a more rosy view of the matter than he (Mr. Dunn) did. By-and-bye, they would get more knowledge and become more daring. The feats of some young architects had been mentioned, and he had himself seen some very daring feats indeed. If he himself had done them they would have been down. It seemed to him that the more they knew about it the less they could play tricks with materials. When they were very inexperienced they did wonderful things which stuck up. He had seen builders dig away the foundations from a wall, which by all rules should have been bruoght down at once, but remained up. But if an architect or an engineer were to do that it would come down at once. He advocated caution, which Mr. Munro's countrymen had always been famous for. It was, he thought, generally accepted that the British Committee's requirements were practical, reasonable, and workable, and he thought there was every likelihood of them being embodied in by-laws by various public authorities. He believed the County Council accepted them in practical works. With regard to Professor Beresford Pite's remark that they should deal with this question from the archæological and artistic point of view, that would be more suitable for another institute. He had to thank those present for their remarks, and for the attentive way in which they had listened to his papers.

Mr. WELLS announced that the next meeting of the Institute would take place at the Royal United Service Institution on Thursday, February 18th, 1909, at 8 u.m., and this brought the meeting to a close.

MONOLITHIC CONSTRUCTION AND METHODS OF CALCULATING STRESSES.

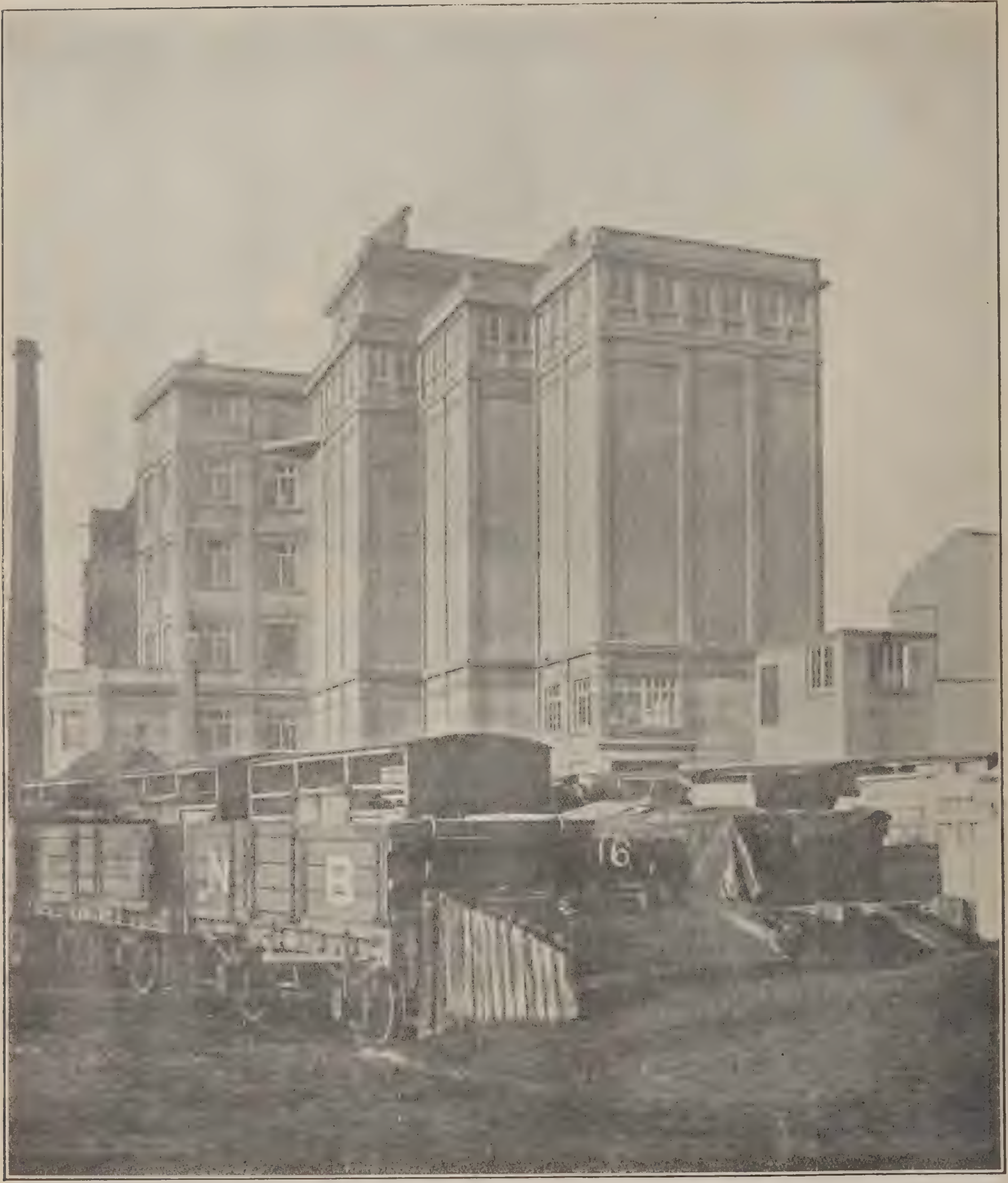
Among the interesting points in the design of reinforced concrete structures, upon which there are very little data that have been obtained as the results of direct tests, is the question of the bending moments in continuous floor construction. With reinforced concrete, the advntages not only in the way of economy, but in the rigidity, freedom from vibration, and stability, gained by the building of the whole structure as a monolith, have been generally accepted, and we are accustomed to find reinforced concrete structures designed with floors as one continuous whole, running from one external wall to the other. Those who have studied the subject in any detail will know that the beams which come below the floor form in reality mere ribs to the floor slabs and beams, and are not similar to those in steel or timber frame construction, namely, of the character of rectangular beams sustaining a floor slab that consists of merely a filling between, but are of the nature of a T beam, part of the floor slab acting as the head or table of the T, while what we call the beams or portions projecting below the floor slab constitute merely the rib or upright member of the T.

Engineers designing in reinforced concrete have made various assumptions in the designing of such ribbed continuous floors, and these assumptions have been based upon a good many experimental data. But the tests that have been conducted have practically all been upon T-headed beams of only single span. Very few tests have been carried out with test beams stretching over several spans, and the information on those that have been tested is not readily available; in fact, we do not know of any records on the subject, though we have seen a statement by M. Considere, that he has tested a continuous beam of three spans. But even tests upon independent beams of T section are hardly sufficient. We really ought to test several parts of a structure to destruction, and make careful observations at every point to ascertain the deflections and the effect of differently applied loads at the first points of failure. Furthermore, it would be desirable to have tests on independent beams resting on several supports in which the reinforcement varies according to the several distinctive systems upon the market in chief use. Such tests would provide us with the information which we at present do not possess, namely, upon the amount of fixity that is obtained at the ends of the beams and over supports. The French Ministerial Commission on Reinforced Concrete suggested that certain allowances should be made, and M. Considere, American authorities, and others, have advocated various amounts of reduction to adopt in calculating the moment of resistance on pieces extending over several supports. This is due to the obvious fact from theoretical considerations that the building-in of a reinforced concrete beam is not perfect, but as to the allowance it would be correct to make there are no experimental data. The building-in may be much more perfect than is supposed; on the other hand, it may be much less. Then, again, the different methods of reinforcement obviously must affect the amount which we should allow for the building-in of the ends. If the building-in at the ends of any pieces were perfect, we obtain from pure theory that the maximum bending moment will be $\frac{wl^2}{24}$ in a uniformly distributed load, and $\frac{Wl}{8}$ in a concentrated load applied at the centre; the reverse bending moment at the supports under the two conditions of loading are $-\frac{wl^2}{12}$ and $-\frac{Wl}{8}$ respectively. Now, some of the early constructors, among them being M. Hennebique, in calculating the bending moment under a uniformly distributed load, take it as $\frac{wl^2}{10}$ at the centre of the span. If we adopt such a theory, obviously the bending moment at the support will be $-\frac{wl^2}{40}$ For concentrated loads on the same assumption we obtain $\frac{Wl}{5}$ at the centre and $-\frac{Wl}{0}$ at the supports. The American regulations require that reinforcements sufficient to resist these amounts of reverse bending moments should be placed over the supports, but experience with actual structures has shown such reinforcement, in many cases, to be insufficient. When beams are fully loaded, it is sometimes found that cracks develop over the supports, though this does not mean that the structure becomes dangerously weak. If these cracks are only sufficient to expose the reinforcement to the danger of corrosion, and not sufficient to rupture entirely the reinforcement at these points, there is no great loss of stability involved, but, if the reinforcement over the supports is thoroughly inadequate under heavy loading, then the beam between, when cracking has taken place, is called upon to act as freely supported, when, of course, the assumption of $\frac{wl^2}{10}$ is too small for the correct bending moment, for under these conditions it should be $\frac{wl^2}{8}$. It has consequently been proposed as a more reasonable assumption, to adopt as the bending moment the following formulæ for the centre of each span:—Uniformly distributed load, $\frac{wl^2}{12}$; concentrated load, $\frac{3Wl}{16}$. If we make this assumption, we must then, to be logical, provide reinforcement over the supports to resist the reverse bending moments, which become $-\frac{wl^2}{24}$ and $\frac{wl}{16}$ respectively.

All this is very haphazard, and not by any means sufficiently satisfactory. In building our beams, we make the moment of resistance equal to the assumed bending moment, but it does not quite follow that the theoretical assumption will work out in practice.

(To be concluded.)

Newport, Mon.—A scheme has been prepared for the erection of about 300 houses on the Malpas Road.



GRAIN SILOS AND FLOUR MILLS, EDINBURGH. F. A. MACDONALD, STRUCTURAL ENGINEER.

GRAIN SILOS AND FLOUR MILLS, EDINBURGH.

The new grain silos and flour mills shown in the accompanying illustration have been built near the Haymarket Station, Edinburgh, for Messrs. John Herdman and Sons, Ltd.

The buildings, which are of reinforced concrete, stand on a site of somewhat limited extent, bounded on the south by the goods sidings of the North British Railway Company, and on the north by the Murrayfield Road. On two sides, therefore, there was no room for extension. The difficulties of the situation were somewhat unusual, and they have been skilfully overcome. The new mill had to be built over an existing railway siding, on which traffic was constantly maintained. Extensive excavations involved the underpinning of the adjoining mill and premises. An old sewer which crossed the site had to be taken up, diverted, and reconstructed. Nevertheless, the work went smoothly on without any delay from beginning to end.

As will be seen from the illustration, the new mill is of seven storeys, and rises to a height of 106ft. 6ins. above rail level. In addition there are several chambers sunk to a depth of 12ft. below the ground-floor level. From the column footings to the roof the approximate height is 120ft. 6ins.

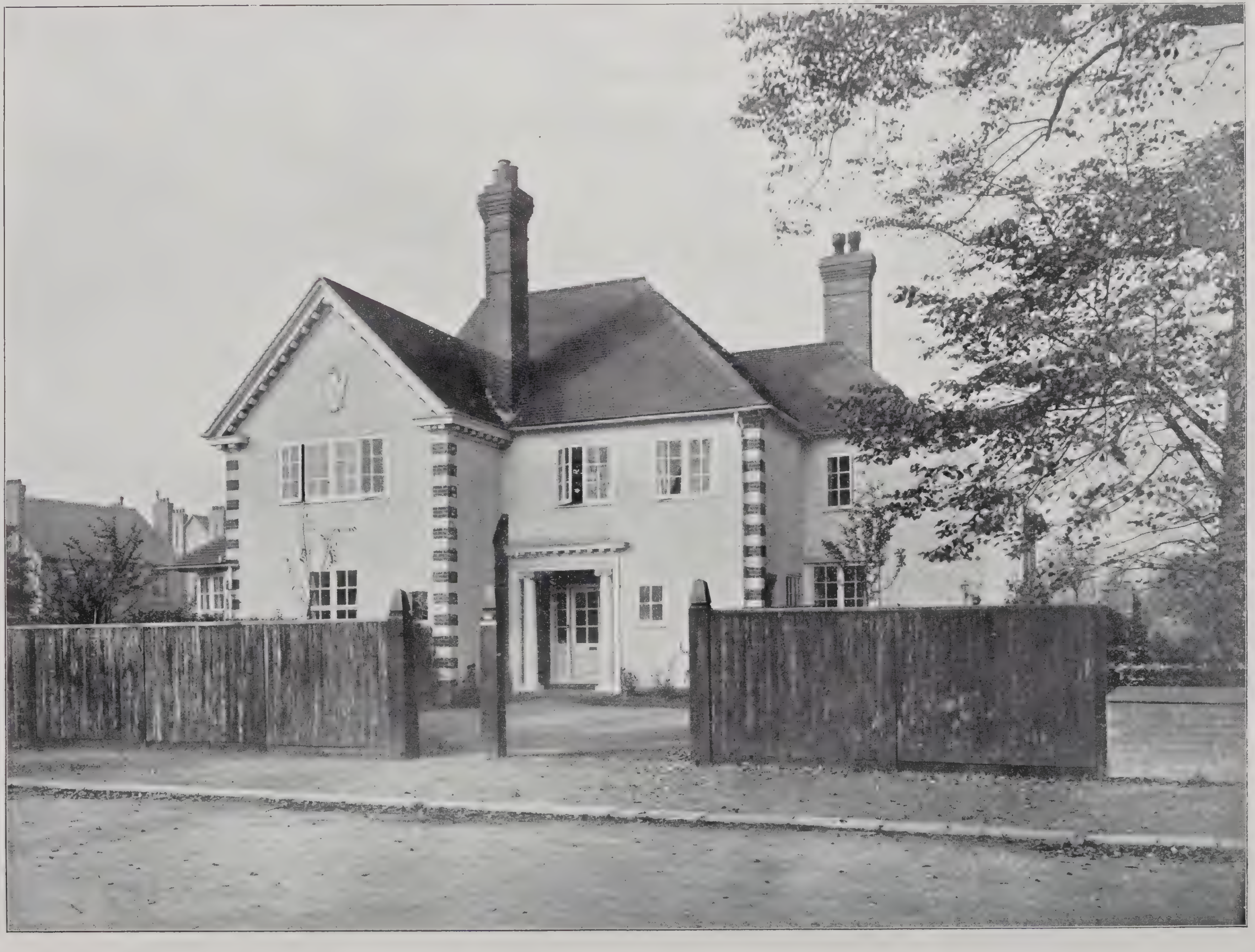
The grain silos consist of twenty-one large chambers or bins, each 10ft. square and 56ft. in height, with a capacity of 4,500 bushels of grain, and there are also one double bin of the same capacity, and twenty-eight small mixing bins, each to hold 900 bushels of grain. The total capacity of the silos is 128,000 bushels of grain, equivalent to 3,550 tons load.

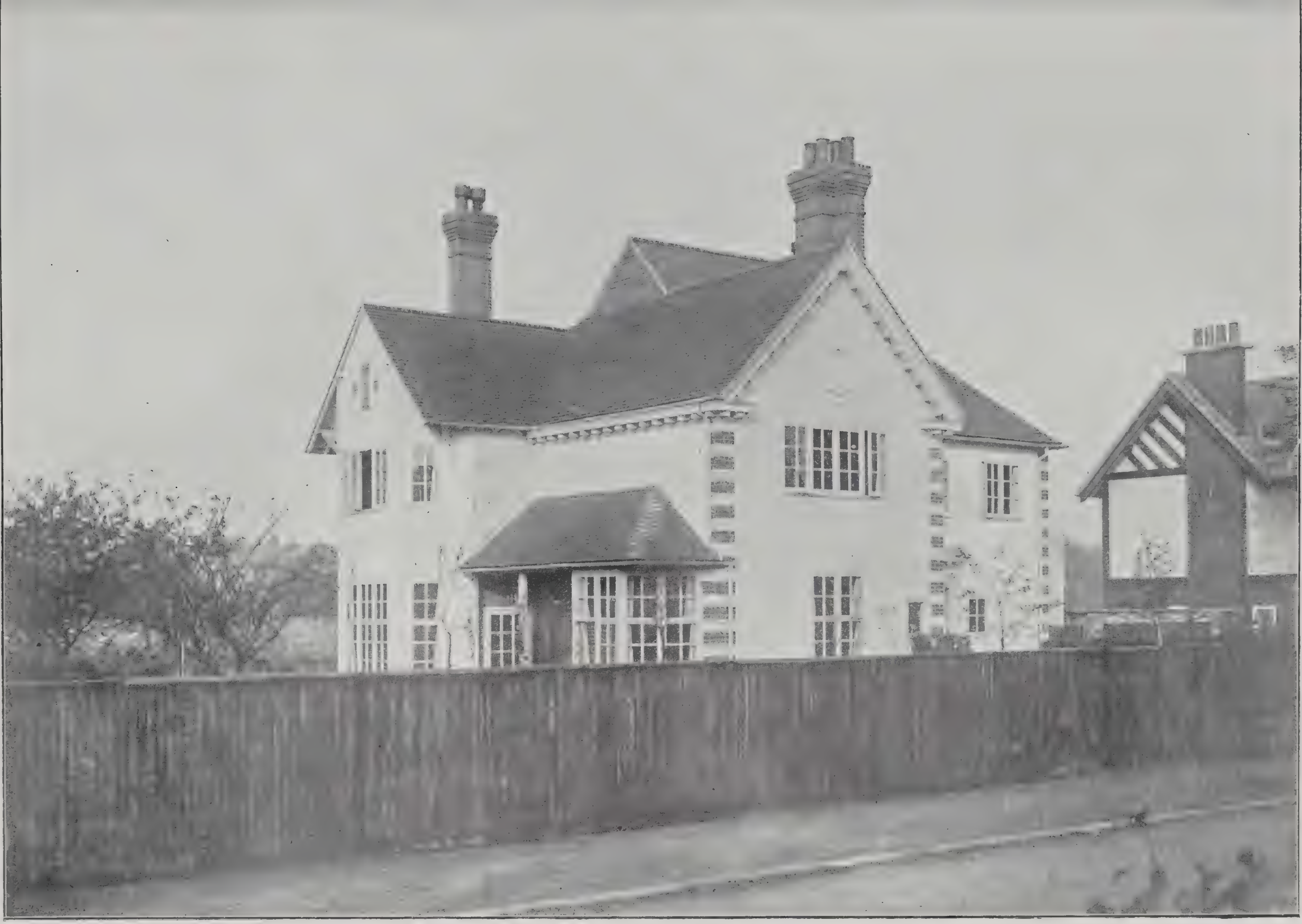
The retaining walls of the main silos are 18ft. in height, and are constructed of reinforced concrete 7ins. thick, with counterforts at every 10ft., for which the main supporting pillars have been utilised. The walls of the sunk basement chambers are also of reinforced concrete.

The first floor of the new mill is carried across the railway siding by means of reinforced concrete arched beams, which support not only the first floor, but also a column rising from the key of the arch to a height of 90ft. On the same floor level will be found a reinforced concrete building projecting in cantilever over a railway siding. The pull cantilever is 16ft., and this projecting building has been so constructed as to allow locomotives to pass underneath, and also to facilitate the hoisting of sacks out of waggons into the main mill.

In three of the upper storeys heavy wood

Supplement to THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER, *Wednesday, January 6th, 1909.*





HOUSE AT DIDSBURY, NEAR MANCHESTER. FAIR AND MYER, A.R.I.B.A., ARCHITECTS.

construction on reinforced concrete beams has been used for the flooring. The object in using the wood was to permit of cutting for the passage of the numerous belts, spouts, trunks, elevators, etc., passing through these floors. The floors over the silos are all of reinforced concrete.

The tower is surmounted by a reinforced concrete reservoir, which, with a capacity of 7,500 gallons of water, is situated at a height sufficient to command the whole of the mill and premises in the event of fire.

The enrichments to the exterior consist of raised surface rectangular panelling and deep frieze cornices. The cornice at the tower level has a projection of 3ft. and is further enriched with heavy dentils. The effect produced by the natural and broad treatment of a reinforced concrete elevation contradicts the prevailing impression that such elevations are necessarily cold and displeasing to the eye, for there can be no doubt that the general effect obtained in this case is distinctly successful.

The structural engineer is Mr. F. A. Macdonald, of Glasgow.

The folowing contractors were engaged on the work: Excavation, mason and reinforced concrete, Robert Thorburn and Sons; joiner and glazier work, W. and J. R. Watson, Ltd.; plumbers, Morrison and Sons, (these are all of Edinburgh); asphalter, Adam Lock, Leith; iron staircases, Walter Macfarlane and Co., Glasgow.

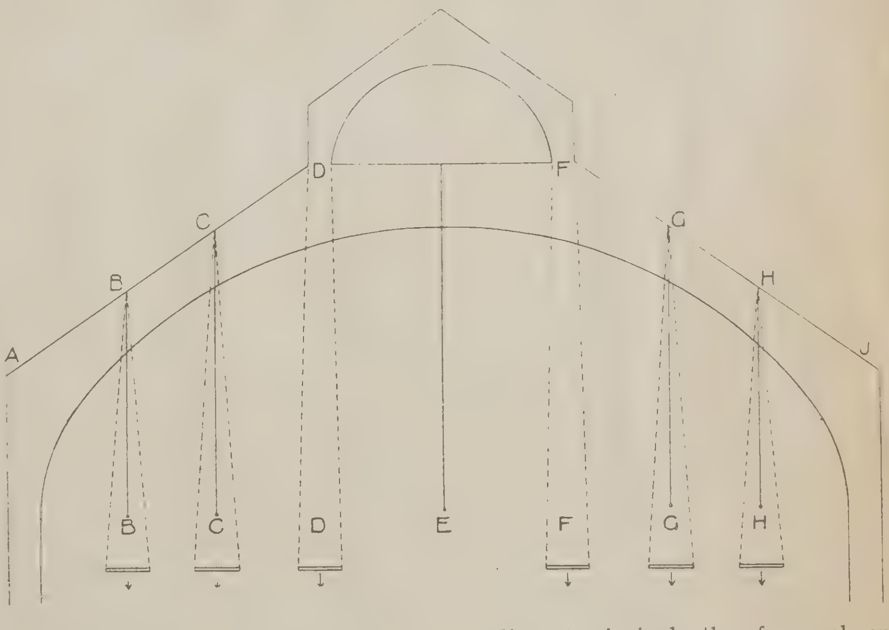
Arrangements have been made at the London County Council Central School of Arts and Crafts, Southampton Row, W.C., for a course of experimental instruction in structural mechanics, conducted by Mr. Percy J. Waldram on Friday evenings, from 7.0 to 9.30, commencing Friday, January 8th, 1909. Experiments will be performed by students upon suitable models and apparatus to determine the stresses and deflections in beams, columns, and roof principals, shoring, etc., and the stability of buttresses, retaining walls, arches and domes. Lectures will be given upon practical design and calculations without the use of higher mathematics, and examples of construction will be worked out. New classes in the school of architecture are also announced. It is proposed to form groups to study the following subjects if a reasonable number of students make application:— i.—A. working drawings and applied geometry; f.—B. foundations: shoring and underpinning; f.—C. sanitation; 1.—D. specifications and estimating; f.i.l.—E. modern construction and use of materials. f.—will assist students working for the final R.I.B.A. examination; i.—will assist students working for the inter R.I.B.A. examination; l.—lectures on the chemisry of materials will supplement this. These classes will run one hour each, one night a week; they will be taken by Mr. S. B. Caulfield, F.R.I.B.A. Arrangements have already been made to begin groups A. and D. A.—Wednesday, 7.30-8.3; D.—Friday, 8.30-9.30.

CROYDON CENTRAL BATHS, SCARBROOK ROAD.

The Croydon Central Baths comprise an open-air swimming bath, a covered swimming bath, and the usual slipper baths for men and women. Having regard to the large population around, and the difficulty of obtaining a site, it was resolved to add a further covered swimming bath to the present institution built upon land belonging to the Council. The extension, as designed by the borough engineer, Mr. G. F. Carter, M.I.C.E., contains a swimming hall about 120ft. by 61ft., with a platform space in addition, and two club-rooms. The swimming bath is 100ft. by 35ft., varying in depth from 3ft. 6in. to 7ft. 6in. Along two sides and one end are plain galleries for spectators, surmounted by dressing-boxes. The swimming hall is roofed over with concrete ribs, and includes a continuous lantern for light and ventilation. More than 800 persons can witness a swimming entertainment, and if the bath were covered in there would be a fine hall capable of holding about 1,500 persons. The cost will be a little more than £8,000. The baths are situated in the centre of the town. The new bath is so designed that it will enable first-class swimming entertainments to be held, and the depth has been made to satisfy the provisions of the Diving Association. The Local Government Board first sanctioned a loan for the new building, but deferred that portion of the estimate which had reference to the roof. The roof was designed to be carried by eight ferro-concrete ribs, having a net span of 61ft. The Board requested that two ribs be selected, and tested by some impartial expert. The specification stated that the centering for each rib should be struck 56 days, and the test applied at 60 days from the construction of the rib. The borough engineer appointed Mr. W. G. Kirkaldy, and on September 25th, 1908, he tested two of the ribs in the presence of the Local Government Board's inspector, Mr. A. A. G. Malet. The Board thereupon gave their sanction to the construction. The reinforcing of the concrete ribs and purlins is by means of Kahn trussed bars throughout.

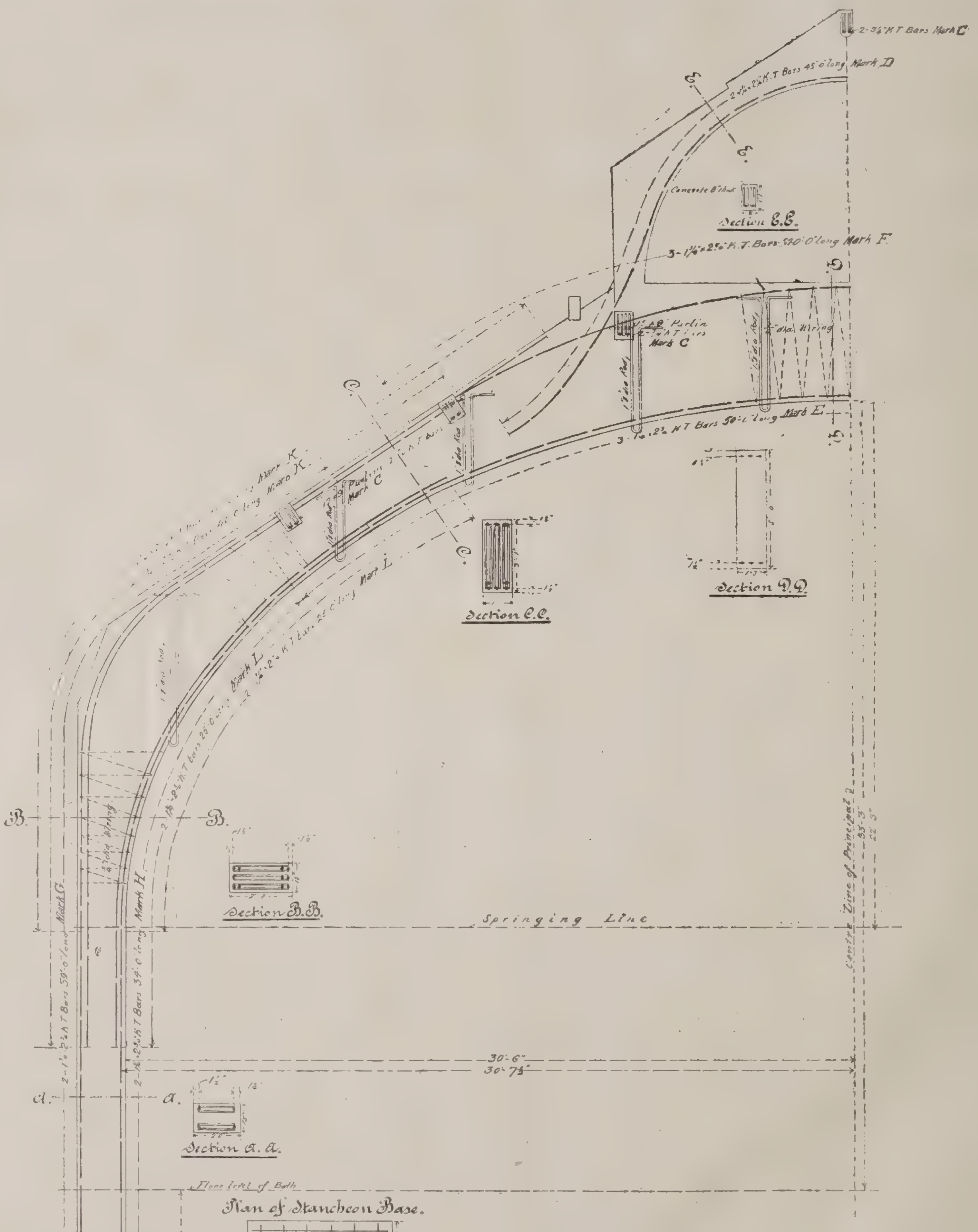
Results of Test on Croydon Baths Roof.

Results of experiment to ascertain the behaviour under test-load of two reinforced concrete roof principals. Proportions, 2½ parts ballast, 1½ sand, to 1 part cement. Age when tested, two months (sketch merely diagrammatic, to illustrate position of application of load). Test conducted by Mr. W. G. Kirkaldy on September 25th, 1908.



The leading platforms were slung from two adjacent principals, therefore each was subject to half the load recorded. The deflections were observed by means of a cathetometer to $\frac{1}{10}$ millimetre, and the calculated equivalent in inches given above. The zero was taken with cradles suspended. On removal of the load from cradles, there was no permanent deflection or set. The amounts of test-load were planned by Mr. Carter.—DAVID KIRKALDY & SON,

Left-hand side.								Deflection at E	Right-hand side.								Total load. on two Principals.
B			C			D			F		G			H			
Added Load.	Total Load.	Deflection.	Added Load.	Total Load.	Deflection.	Added Load.	Total Load.		Added Load.	Total Load.	Added Load.	Total Load.	Deflection.	Added Load.	Total Load.	Deflection.	
cwts.	cwts.	inch.	cwts.	cwts.	inch.	cwts.	cwts.	inch.	cwts.	cwts.	cwts.	cwts.	inch	cwts.	cwts.	inch	tons—cwts.
7.0	cradle	zero	6.0	cradle	zero	8.0	cradle	zero	8.0	cradle	7.5	cradle	zero	6.5	cradle	zero	2— 3
6.0	13.0	.00	8.0	14.0	.00	14.0	22.0	.00	14.0	22.0	5.0	12.5	.00	7.0	13.5	.00	4—17
7.0	20.0	.00	6.0	20.0	.00	10.0	32.0	.02†	10.0	32.0	7.5	20.0	.005†	6.5	20.0	.00	7— 4
7.0	27.0	.00	7.0	27.0	.00	13.0	45.0	.03†	13.0	45.0	7.0	27.0	.005†	7.0	27.0		9—18
No further load added to this side									Loading continued on this side								
		†.01			†.02			.01†	23.0	68.0	13.0	40.0	.01†	13.0	40.0		12— 7
		†.02			†.025			.01†	11.0	79.0	7.0	47.0	.01†	7.0	47.0		13—12
		†.03			†.04			.02†	11.0	90.0	7.0	54.0	.02†	7.0	54.0		14—17



THE CROYDON CENTRAL BATHS. HALF SECTION OF REINFORCED CONCRETE ROOF TRUSS AND STANCHEON.

G. F. CARTER, M.INST.C.E., BOROUGH ENGINEER.

(See p. 13.)

THE BRITISH ALUMINIUM CO.'S WORKS AT KINLOCHLEVEN, N.B.

The great and increasing demands for aluminium, the constructional, electrical and domestic uses of which are now legion, have resulted in The British Aluminium Company, Limited, undertaking a great scheme for the manufacture of the metal at Kinlochleven, Argyllshire. This will largely increase their output, already great, for they already have factories at Larne, Foyers, Greenock, and Milton, as well as abroad at Stangfjord and Orsieres. A dam has been constructed 5½ miles from the head of Loch Leven, to conserve the necessary water to provide the power, which will amount to over 30,000 h.p.

The pipe line extends from the dam to the village at Kinlochleven, which has been entirely created by the enterprise of the Company. Two large factories have been constructed, and the Carbon Factory is the subject of the majority of our illustrations. Its S.W. elevation is shown. Reinforced concrete on the Coignet system has been employed for the foundations, which required skilful design and careful construction to insure absolute rigidity, owing to the elaborate construction of the great baking furnace, which is the *raison d'etre* of the factory. Though the illustrations show the works in a comparatively early state of their erection, they are now practically completed. Probably, however, the most interesting feature from the point of view of reinforced concrete, will be the gigantic bunkers which are now in course of construction. We believe it is correct to say that they will be by far the largest bunkers ever built in armoured concrete, and probably the biggest works of that kind ever constructed in this country in any material. One of the illustrations shows the main columns on which the bunkers are now being built.

The aggregate use for the reinforced concrete was crushed local stone, carefully screened and washed, and the cement employed was of the "Ferrocrete" brand, which is specially manufactured for reinforced work. Stringent tests have been carried out on various parts of the building, with results that have proved very satisfactory to those concerned, both with the design and the construction.

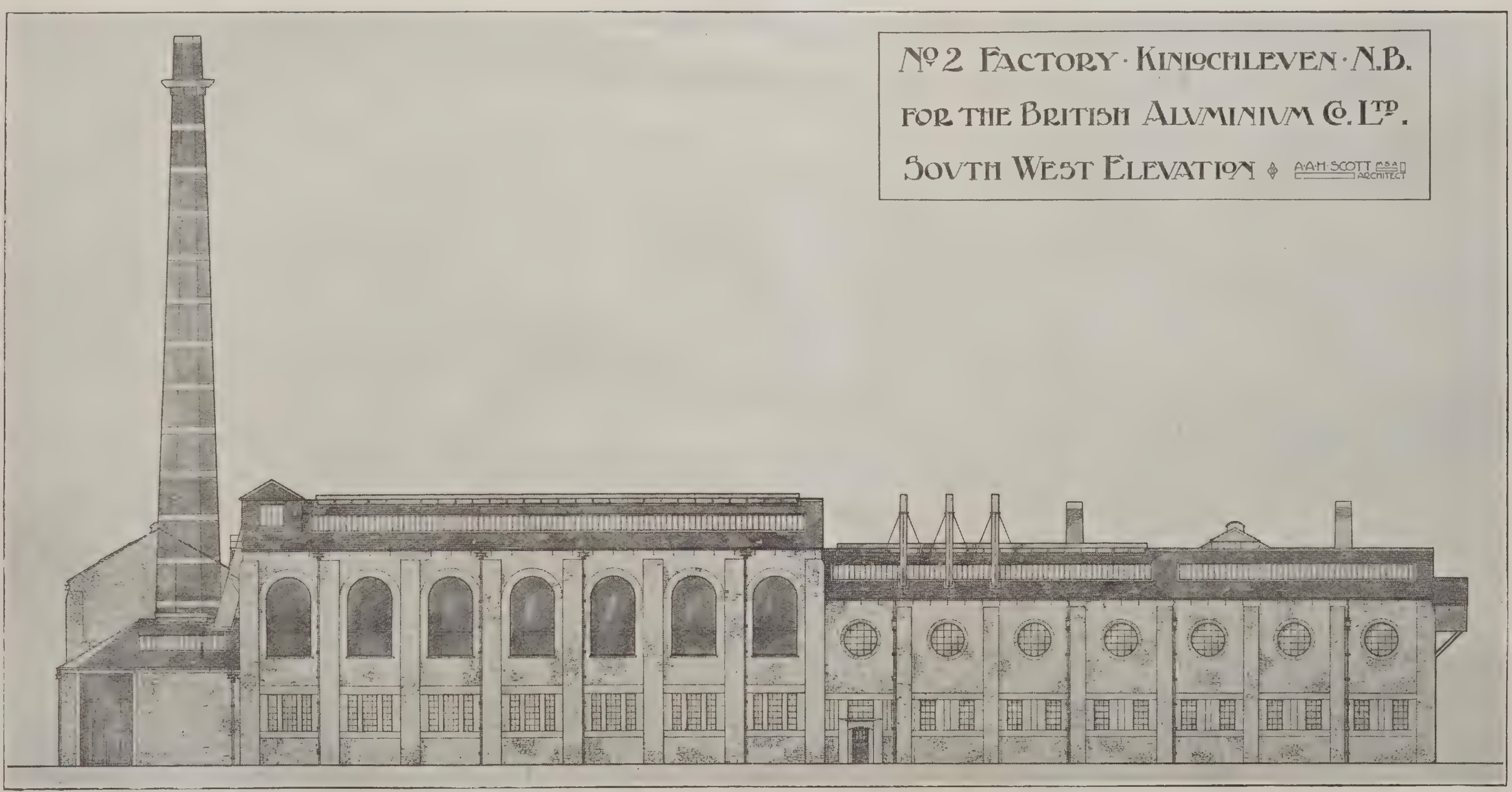
The factory walls are of rubble masonry, of local stone, and the roofs are of steel, the patent glazing being carried out by The British Luxfer Prism Syndicate, Limited. and the steel sashes by Messrs. Field, Mallett and Co.

The factory is equipped with labour-saving plant of the most modern description, by Messrs. Graham, Morton and Company, the boiler is being supplied by Messrs. Andrew Brown and Company, and the motors and switchboard by Messrs. Siemens' Bros., Dynamo Works, Ltd. The contract for the furnace, which will develop a very high temperature, was placed with Mr. Jens Orten-Boving.

We also show views of a culvert about 500ft. long, at Kinlochleven, which has been constructed in connection with the British Aluminium power scheme, on the Coignet System, by Messrs. McLaughlin and Harvey, of Belfast. The architect for the factories, and also for the village, offices, etc., at Kinlochleven, is Mr. A. Alban H. Scott, M.S.A. (of Messrs. Scott and Fraser, 10, Basinghall Street, E.C.). The whole of this great enterprise has been carried to its successful conclusion under the direction of Mr. W. Murray Morrison, Technical Adviser to and Managing Director of The British Aluminium Co., Ltd.

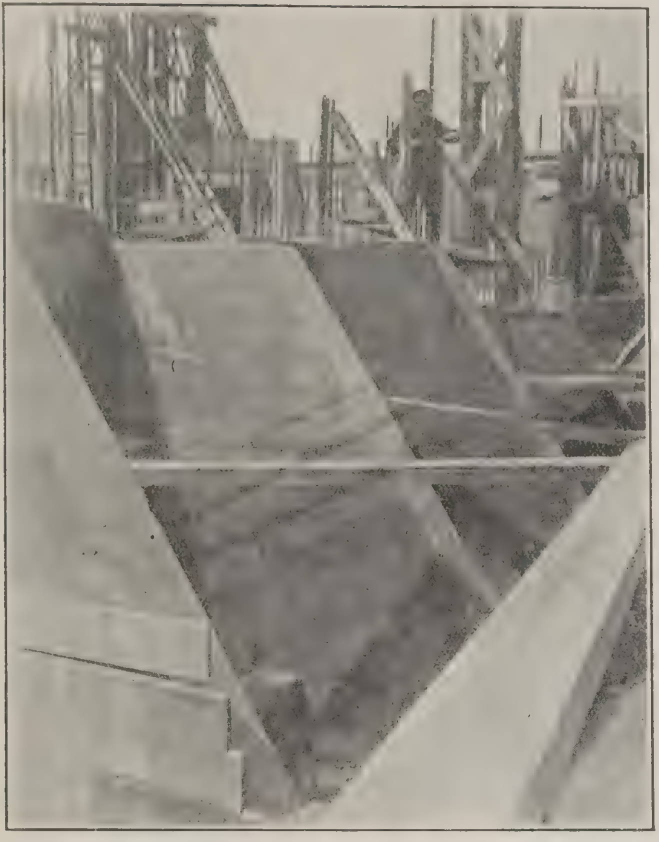
BRITISH ALUMINIUM CO.'S WORKS, KINLOCHLEVEN. MAIN COLUMNS FOR THE BUNKERS.
A. ALBAN H. SCOTT, M.S.A. (SCOTT AND FRASER), ARCHITECT.

(BRITISH ALUMINIUM CO.'S WORKS, KINLOCHLEVEN, ARGYLLSHIRE. A. ALBAN H. SCOTT, M.S.A. (SCOTT & FRASER), ARCHITECT.


No 2 Factory · Kinlochleven · N.B.
For the British Aluminium Co. Ltd.
South West Elevation
A·A·H· Scott M.S.A. Architect

THE BRITISH ALUMINIUM CO.'S WORKS, KINLOCHLEVEN, ARGYLLSHIRE. SOUTH-WEST ELEVATION OF THE FACTORY.

A. ALBAN H. SCOTT, M.S.A. (SCOTT AND FRASER), ARCHITECT.



BRITISH ALUMINIUM CO.'S WORKS, KINLOCHLEVEN.
SOME OF THE BUTTRESSES, SHOWING THE REINFORCEMENT.
A. ALBAN H. SCOTT, M.S.A. (SCOTT & FRASER), ARCHITECT.

The main building contract is in the hands of Messrs. Robert McAlpine and Sons, of Glasgow and London, who specialise both in reinforced concrete and in the rapid construction of factories.

Messrs. Robert McAlpine and Sons have also just completed for the Dundee Corporation, reinforced concrete foundations, on the Coignet System, and they are making considerable use of reinforced concrete at the large contract for the Island Barn Reservoir, for the Metropolitan Water Board, under the direction of Mr. Wm. B. Bryan, M.Inst.C.E.

RUSTING OF STEEL INSIDE A CONCRETE COVERING.

We have received the following letter from the Concrete Institute:—

Dear Sir,—It has been brought to the notice of the Concrete Institute that in one or two reinforced structures a noticeable deterioration has taken place on account of the rusting of the steel inside the concrete covering. Apparently these cases are very rare, the bulk of the structures having stood the test of time exceedingly well. These special cases have, however, served to cause some uneasiness to engineers and architects who contemplate using this material, and to others who have to sanction that use. It is most important that the reputation of a building material, which is undoubtedly successful and excellent, should not be marred by occasional mishaps. The Science Standing Committee of the Concrete Institute has, therefore, been asked to investigate these cases of rusting and to find out their cause, in order that such deterioration may be entirely prevented in future. You are asked, therefore, to assist the Committee by giving them all possible information about the behaviour of any reinforced concrete structures which have come under your notice, whether they have suffered or not. Such information will, if you desire it, be treated as strictly confidential, and in no case will names, either of persons or places, be published. It is felt, however, that members of the professions will not hesitate to tell all they know about this material, seeing that it has come into use so recently that no amount of foresight could be expected to guard against every form of deterioration. The Committee will gladly reciprocate your courtesy by placing at your disposal the conclusions they come to after they have investigated the matter.

It is suggested that the information may be given in the form of answers to the following questions, but it will be readily understood that whether or not this form is adopted, it will be of great assistance to the Committee to have information as full as possible. Hand sketches or drawings will be of great value.

(1). Have you ever examined any reinforced concrete structure with a view of ascertaining whether the reinforcement was rusting under the concrete?

(2). What was the nature of the structure?

(3). Did you cut away the concrete or merely examine the surface?

(4). Was the structure exposed to wet or bad weather?

(5). What was the nature of the concrete? Mixture, thickness, condition?

(6). What was the nature of the reinforcement? Iron or steel, thickness of main bars, thickness of secondary reinforcement, and thickness of covering of concrete?

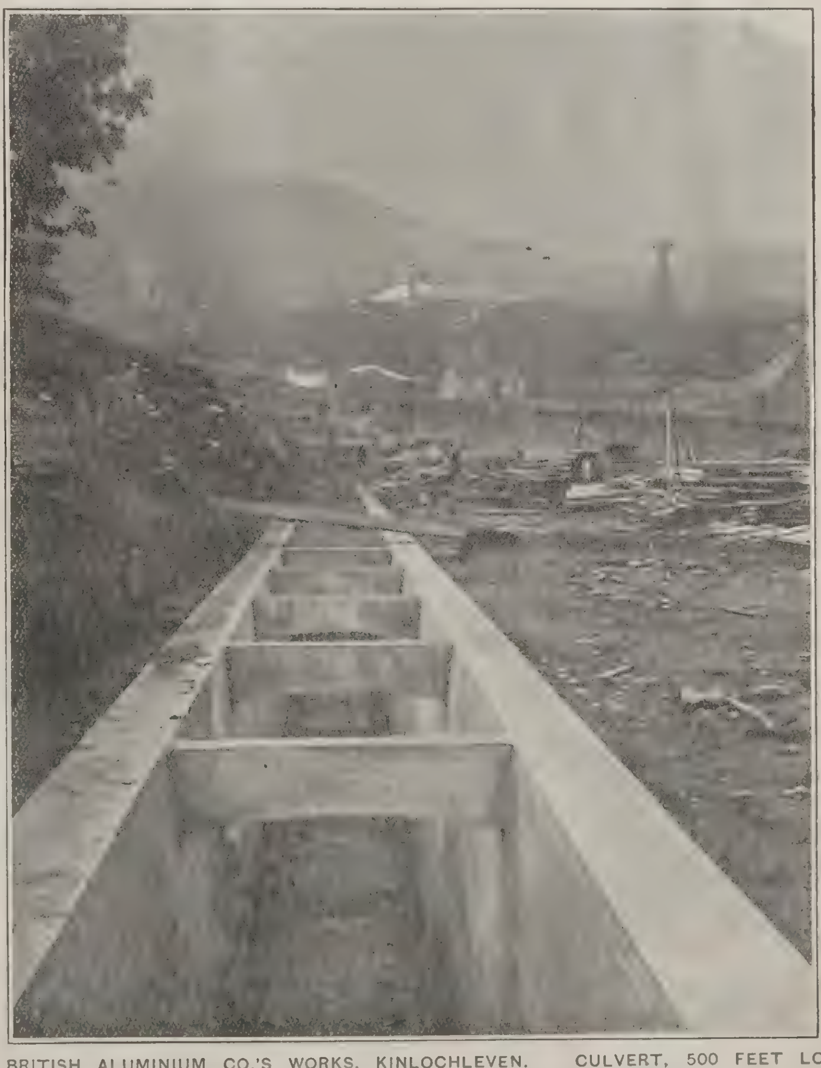
(7). Did you find the steel rusted? If so, to what extent?

(8). Did you find the concrete cracked? If so, to what extent?

(9). Are there any special circumstances, such as heavy load, special chemical action, etc., which may have affected this case?

I am, dear sir, yours very truly,
ARTHUR. E. COLLINS,
Hon. Secretary.

P.S.—Replies are requested by February 1st latest, but an early reply would be much appreciated.



BRITISH ALUMINIUM CO.'S WORKS, KINLOCHLEVEN. CULVERT, 500 FEET LONG.
A. ALBAN H. SCOTT, M.S.A. (SCOTT & FRASER), ARCHITECT.

REINFORCED CONCRETE SYSTEMS.

The Chain Concrete System.

What is known as the Chain Concrete system of reinforced concrete construction has now been in use for several years in Yorkshire, and the merits of the system soon spread its fame far beyond that county. The Chain Concrete Syndicate commenced operations in Castleford, but they now have their chief office at 1, Basinghall Square, Leeds, and they are conducting a considerable business in various parts of the country. The system is the invention of Mr. R. M. McDowall.

Briefly, the system consists in the adaptation of a patent clip, the form of which is shown in Fig 1. Because we can sum up the basis of the system in such a contrivance, it must not be supposed that this constitutes the whole sum and total of the system. Far from it; the clip only represents a fundamental idea which Mr. McDowall has applied. The system in its entirety embraces many variations upon other systems, and the patent clip becomes simply a method of attaching one reinforcement to another.

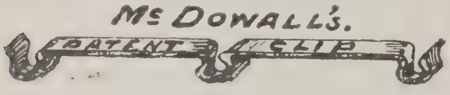


FIG. 1.

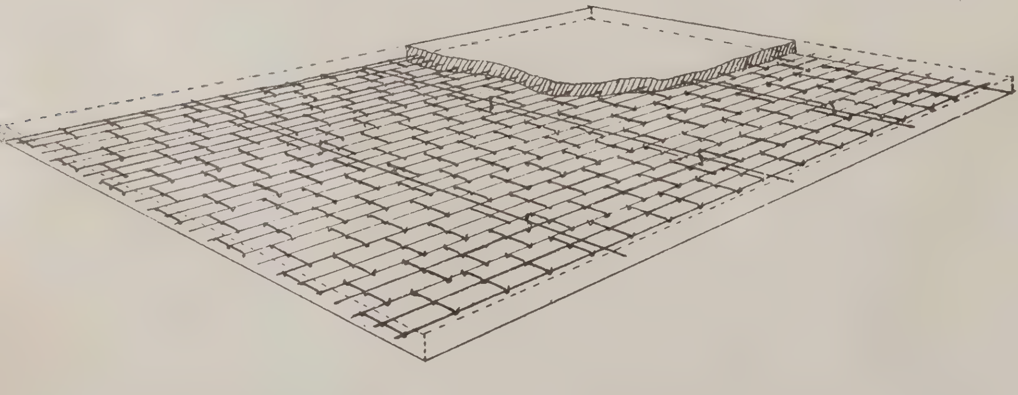
The Chain Concrete Syndicate recognises the importance of providing against the possibility of the steelwork getting out of place during the process of concreting, and their clip attachment is their means of endeavouring to overcome this.

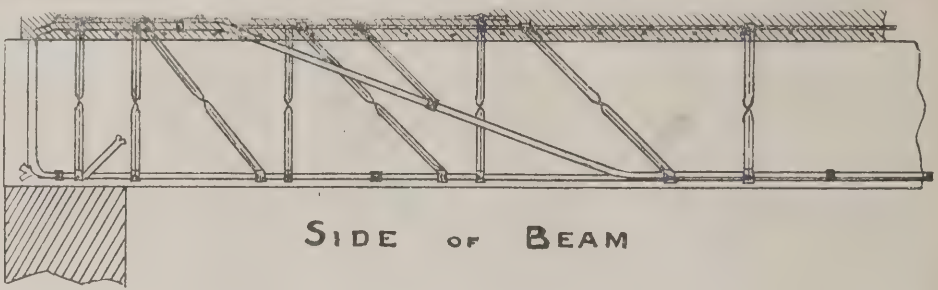
Fig. 1 shows, in a general way, how flat strip iron is nipped round the bars, and the clips not only conform to that illustrated in the figure, but in the succeeding illustrations they are shown in various other forms.

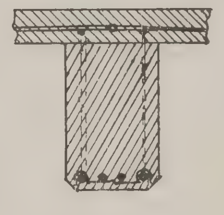
The clips are made from flat bar steel ¼in. thick, and from ½in. to 1½ins. broad, according to the position they occupy, and are cut by special machinery to the exact patterns required.

It will be obvious that these clips can be used to obviate any danger of the bars sinking under the weight of concrete, so as to come too close to the under-surface of the concrete, and so expose them to the danger of having insufficient protection in the case of fire.

The form of clip with three loops, illustrated in Fig. 1, is used for floors and walls. The loops are made to provide any spacing of the rods, such as, for instance, at 4in. to 6in. centres. The bars are placed in each loop, and the clips set at specified distances apart on the bars. They are then clinched with special tools. The general arrangement of a floor slab reinforced in this manner is shown in Fig. 2. It is obvious by thus connecting the rods when they are fixed so that they cannot get out of place in the operation of applying the concrete, that an advantage is obtained by such means quite apart from the advantages before mentioned, for the whole of the steelwork for a floor can be assembled in place and checked before any of the concreting is undertaken, and no fear need be had of the bars getting out of place.


PATENT STEEL CHAINWORK.
FLOOR PANEL.
FIG. 2.


SIDE OF BEAM


SECTION
FIG. 3.

For reinforcing beams, the method employed is to use round steel rods for the main bars, some of these running straight through to the supports, while others, in the case of beams built-in or continuous, are cranked up at an angle of about 35 degrees, partly to take shear and partly to bring the reinforcement in place to resist the tension at the top of the beam over the support. For additional reinforcement against shear, the clips, formed in the same way as for the slabs, are fixed to the bottom bars and to a similar top rod. At the centre of the beam the clips are placed vertically, but towards the supports they are placed at an angle of approximately 45 degrees. In this way the reinforcements are locked together and do not become displaced in the process of concreting, and the provision of a top rod makes the work of construction more convenient, and reduces the depth of the beam. Fig. 3 shows how additional top rods are placed over the supports when the tension is considerable.

Fig. 4 shows the connection of two beams with a column, or rather, we may call it a continuous beam reinforcement. The method of turning over the ends of the top rods may be noted, and the other general methods involved.

The column foundation (Fig. 5) is also somewhat novel in its method of reinforcement, but to those familiar with the theory of the subject its advantages will be obvious The plan of the foundation base of the column in conjunction with the section shows how the rods are clipped together.

As regards the reinforcement of the column here illustrated, the remarks we make apply equally to piles. The columns (or piles) may be square, or other shape, in cross section. Main bars are placed vertically in the column at the angles and at the centre. The rod that is directly in the centre, is of smaller section, as a rule, than those on the outside. The main outside rods, connected by McDowall's patent clips, are clinched at each end to the bars as before described for floor slabs. In addition to the horizontal clips, others are placed inclined from the outside rods to the centre rod. In this way the corner of the column is reinforced, and the tendency to outward bulging and internal cracking are alike resisted. The provision of this central vertical bar is a feature of the system which is novel as far as we are aware in reinforced practice.

Fig. 6 shows floors, corridors, and flat roofs in course of construction on the Chain Concrete system at the new Secondary School at Castleford, of which Mr. W. S. Braithwaite, of South Parade, Leeds, is the architect. Diagonal distribution rods may be noted, and the arrangements of the clips is very clearly shown in this view.

(*To be concluded.*)

In Parliament.

Coal Residues in Reinforced Concrete.

In the House of Commons on 21st December, Mr. Annan Bryce asked the President of the Local Government Board what had been the result of inquiries which he promised to make as to the forbidding throughout Germany of the use of coal residues in reinforced concrete for building purposes, and whether he proposed to take any steps with regard to the use of such material in England.

Mr. John Burns stated:—I have made some inquiry on this subject, but my investigations are not at present concluded, and in the meantime I am not in a position to come to a conclusion with regard to the use in England of the material referred to.

The new gates required in connection with Mr. F. W. Speaight's scheme for the improvement of the Marble Arch have now been placed in position. They were designed by the Office of Works, and were wrought by Messrs. H. H. Martyn and Co., of Cheltenham. Their total cost will be about £3,000, and the work has occupied some seventy or eighty workmen for about three months. The weight of the gates is estimated at nearly forty tons, and the whole of the material, as well as the labour employed, is British.

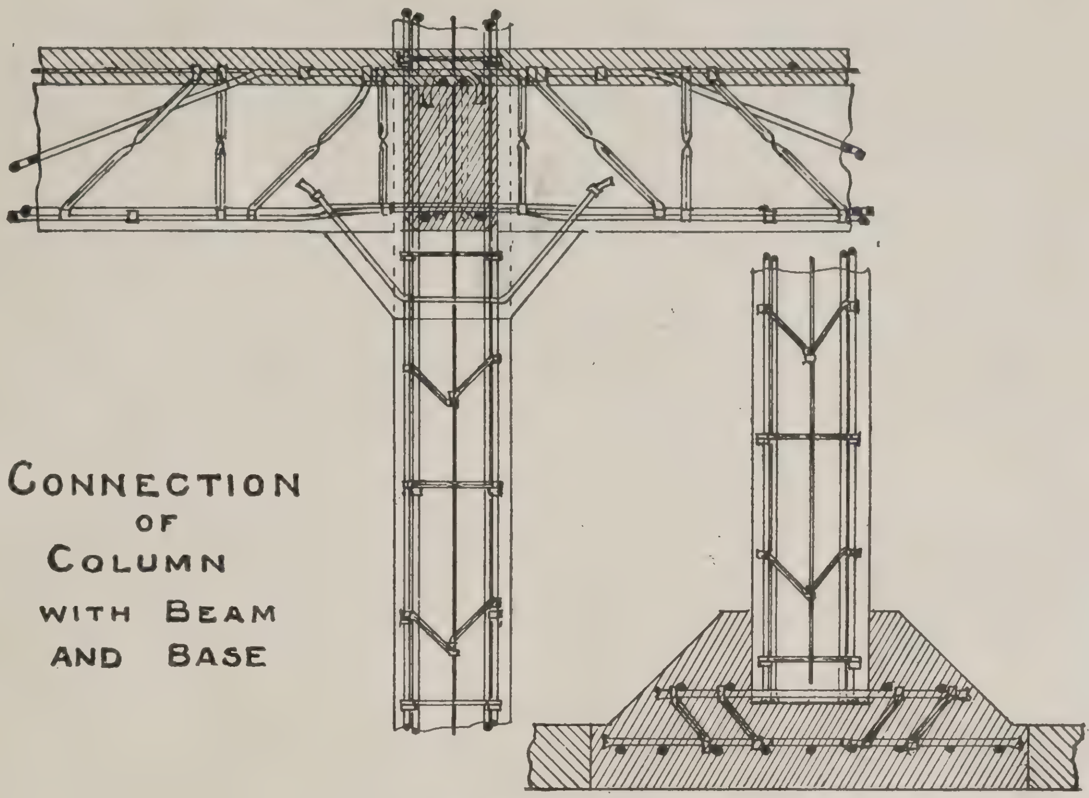
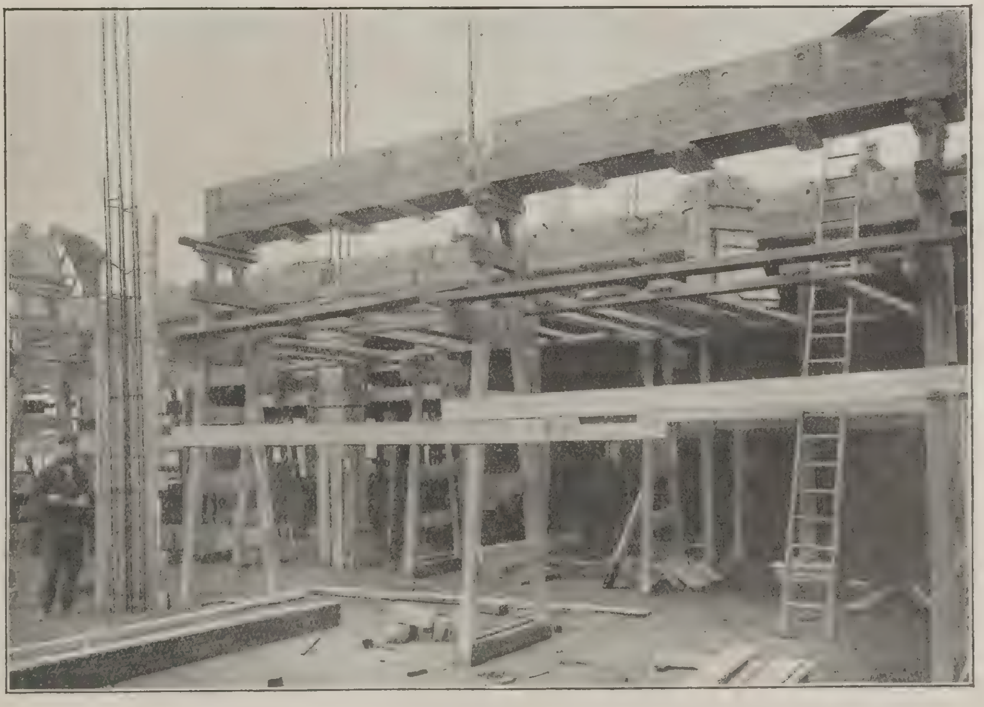


FIG. 6.—CHAIN CONCRETE CONSTRUCTION.



NEW SECONDARY SCHOOL, CASTLEFORD. CHAIN CONCRETE CONSTRUCTION.
W. S. BRAITHWAITE, ARCHITECT.

Trade and Craft.

Electric Lighting Specialities.

The "Diamond H" switches, described and illustrated in catalogue C of the Hart Manufacturing Co., Hartford, Conn., U.S.A., whose European branch is at 72, Victoria Street, S.W., are the product of many years of experience in the invention and manufacture of switches and accessories. Stress is laid on the scrupulous care used in the selection of the material that is best suited to the different purposes. All parts are made sufficiently strong, and the mechanism of both push button and rotary switches is simple and efficient. Sheet mica, which will neither wear out nor burn out, insulates the mechanism from the current-carrying parts. The parts of the mechanism subjected to wear are made of case-hardened and tempered tool-steel, and the contacts are of genuine phosphor-bronze. All switches, as made by this company, indicate clearly whether the switch is "on" or "off," the said condition being shown by the buttons of the push switch, or by the position of the handle of the rotary flush switch, or, in the case of the surface switches, by an indicating dial. One of the many advantages in the use of these switches, more particularly from an artistic standpoint, is that they are sunk flush with the wall of the room. The face plates may be made as elaborate as desired, and in a great variety of finishes. These are usually designed to correspond with the other metal fittings of the room in which they are installed. An adjusting spring with which the rotary handle is provided is contained in the body of the handle, and not between the body of the handle and a separate collar. The lock push switch is operated by means of a key, the keyholes being of such a shape that nothing but the proper key will control the switch. The rotary lock switch contains a spring-pressed stud which carries a feather adapted to engage the notch in the end of a removable key. The "Diamond H" automatic door switch, for operating a light on the opening or closing of a door, is enclosed in a porcelain box, and the face-plate and strike are of brass; the part making the connection between the two spring phosphor-bronze contacts being carried by a swinging arm driven by the switch mechanism. A very compact apparatus is the combination tandem gang, which, comprising two push switches and one rotary electrolier switch, is for use in banquet halls, drawing-rooms, etc. The push switches control the side or bracket lights, and the central switch controls the central electrolier, and has four operations. The first turn lights one section, the second turn two sections, the third turn the whole electrolier, and the fourth turn puts all the electrolier "off."

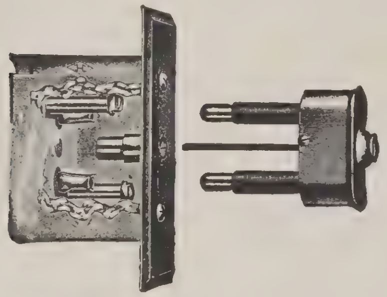


Fig. 1. Showing plug out.

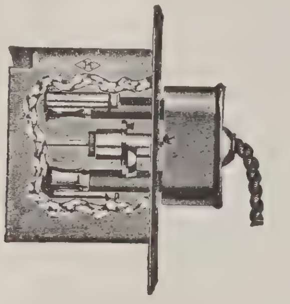


Fig. 2. Showing plug in.

Another product of this firm is the flush receptacle and plug, with automatically closing apertures, which may be sunk either in the floor or in the skirtings of a room. When the plug is withdrawn, the plate is automatically sealed up, thus excluding dust and moisture. These plugs are in very general use for many purposes for which a plug is desirable. They are particularly adapted to the installation of electric radiators. Descriptive lists and all other information may be obtained on application to the company's offices, Belgravia Chambers, 72, Victoria Street, London, S.W.

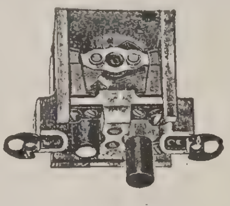


Fig. 3. Showing Switch.

This booklet is particularly valuable for the very full description given in each instance, and for the clearness with which the mechanism is shown in the illustrations.

* * *

D. G. Somerville and Co.

Messrs. D. G. Somerville and Co., of 72, Victoria Street, S.W., manufacturers of fire-resisting flooring, and specialists in structural steelwork, etc., intimate that, in view of the continued increase of their business, they are building large offices for their engineering staff at their works, Archangel Wharf, New Cross, S.E. The Westminster address of the firm will be 116, Victoria Street, S.W., as from December 25th, 1908.

* * *

Honeyman Ventilating System.

Ventilation by the Honeyman system is described in an ingeniously contrived folding booklet that has just been issued by Messrs. Richard Crittall and Co., of 197, Wardour Street, Oxford Street, W. The distinctive peculiarity of the apparatus is that it creates an exhaust current in a large tube by means of a much smaller tube or orifice, which is an inversion of the usual arrangement. A tube of only 3ins. in diameter is all that is required to create a strong exhaust action in a tube 10ins. by 16ins., so that a comparatively small apparatus gives a very large area of outlet; and while there is not the slightest risk of down-draught, there is no intrusive interference with the architecture of a building. No turret or cowl of any kind is required. These ventilators have given satisfaction during the past twenty years.

* * *

Fan Notes.

"Fan Notes," setting forth the relative merits of different types of ventilating fans for various classes of work, includes also an instructive and a somewhat piquant controversy on the subject, in which Mr. James Keith, M.Inst.C.E., etc., managing director of Messrs. James Keith and Blackman Co., Ltd., puts forward an able and a convincing vindication of the system in which his firm is interested. The pamphlet is fully illustrated, and contains much information of undoubted value. The pamphlet may be had from the firm's head office, 27, Farringdon Avenue, London, E.C.

Merrywood.—The new elementary school, opened here on Dec. 15th, provides accommodation for 500 scholars, and is the design of Mr. H. Dare Bryan. The school, a special feature of which is the central hall, which has a cross vaulted barrel ceiling, has cost £7,205, and the site, measuring 3,133 sq. yds., £2,000. The various contractors are as follows: Builder, A. J. Colborne, £5,313; plumber, A. S. Scull, £279; heating, W. J. Spry and Co., £338; electric lighting and ventilating, P. Jolin and Co., £206; furniture, R. Palmer, £252.

Federation News.

Scarborough.—The annual dinner of the Scarborough Master Builders' Association was held at the Albemarle Hotel, on December 19. Mr. Oxley Smith presided, and was supported by Mr. R. Watkinson (vice-president), Mr. W. A. Sinclair (representative on the Yorkshire Federation), Councillor G. Mansfield, J.P. (York, ex-president of the Yorkshire Federation), Alderman Maynard, Councillor Moore, Councillor Malton, Mr. G. B. Parker (secretary), and others. Mr. A. W. Sinclair, in proposing "The Yorkshire Federation of Building Trade Employers," said that the one thing which pleased him more than any other was the construction of conciliation boards, which were doing an immense amount of good in every part of the country. It was through the intervention of such boards that strikes and lock-outs did not take place. Mr. Sinclair also referred to the fact that though the building trade was bad in all parts of the country, no society, to his knowledge, had ever reduced the workmen's wages, which he considered showed a good feeling on the part of the employers. Councillor Mansfield (York) responded. Mr. R. Watkinson proposed "The Scarborough Master Builders' Association," and the President responded. Mr. G. B. Parker gave "The Architects and Surveyors," for whom Mr. Caleb Porch replied. Mr. W. Malton proposed "The Municipality and Trade of Scarborough," which was responded to by his brother, and the toast of "The Visitors," was proposed by Mr. R. W. Jowsey, and responded to by Alderman Maynard.

STOCKTON-ON-TEES DISTRICT ASSOCIATION.

Secretary: W. C. Creasor.

The annual meeting of the Stockton-on-Tees and District Association was held December 2nd. The secretary presented his annual report, which dealt with various matters, including Durham County Council Education Committee Building agreement, proposed reduction of wages which was strongly opposed, the adoption of the Builders' Journal as the official organ of the National Federation, and the scheme for regulating payments to sub-contractors.

The balance-sheet, presented by Mr. R. Johnson, treasurer, showed a substantial balance in hand. Four firms were proposed and accepted as honorary members. The election of officers resulted in the re-election of Mr. J. Davison, as president, Mr. W. Colpitts, as vice-president, Mr. R. Johnson, treasurer, Mr. A. J. Cooke and Mr. G. E. Grey, as auditors, and Mr. W. C. Creasor, as secretary.

The levy was fixed at three shillings per cent. on wages paid, minimum 21s. The following were elected after a ballot vote:—Representatives Northern Counties Federation, Messrs. Davison, Johnson, Grey, Taylor, T. Brown and L. Brown. Representatives to Teesside Association, Messrs. G. Nicholson, J. Guthrie, L. Brown, T. Brown, R. Johnson, and W. Doughty. Representatives on Conciliation Board, Messrs. Johnson, Benson and Cooke.

The proposed form of sub-contract was discussed at length, and the matter left for decision at Teesside annual meeting.

It was decided to support Middlesbrough Association in their motion to alter the constitution of Teesside Committee.

Bankruptcies

Avery, J. T., builder, Mere. R.O., Dec. 23. Adj., same day.

Wilkie, R. I., and Herbert Hammond (trading as Robert Wilkie and Co.), builders, Plumtree. First meeting, O.R.'s, Nottingham, Jan. 8, at 11. P.E., Nottingham C.C., Jan. 19, at 10.30.

Ballard, Percy, architect and surveyor, Oxford Buildings, Long Eaton. P.E., Derby C.C., Jan. 19, at 11. Adj., Dec. 14.

Marsh, Tom, builder, Clevedon, Victoria Road, Upper Parkstone. P.E., Town Hall, Poole, Jan. 8, at 11.30. R.O., Dec. 14. Adj., Dec. 15.

Gann, Hugh Mortimer, builder and lead merchant, West Mersea. R.O., Dec. 18.

Sexton, Archibald, builder, West Bergholt. P.E., Law Courts, Colchester, Jan. 22, at 11.30.

Adams, J. W., builder, Markham Road, Bournemouth. P.E., Town Hall, Poole, Jan. 8, at 11.30. R.O., Dec. 18.

Bastable, George, builder, 169, Lower Derby Road, North End, Portsmouth. P.E., Portsmouth C.C., Jan. 25, at 11. R.O., Dec. 14. Adj, same day.

Welstead, S. J., builder, 63, King's Road, Bournemouth P.E., Town Hall, Poole, Jan. 8, at 11.30. R.O., Dec. 18. Adj., same day.

Pillar, H. S., builder, Poplar Cot, West End Lane, Pinner, and 8, Ross Parade, Ross Road, Wallington. Adj., Dec. 15.

Reed, F. H., architect and surveyor, 9, John Street, Adelphi, W.C. Adj., Dec. 16.

Tritt, Thos., builder, 36, Crescent Road, Wood Green. R.O., Dec. 18. Adj., same day.

Vaughan, D. J., builder and contractor, Dromore, and Commercial Buildings, Tredegar. P.E., Town Hall, Tredegar, Jan. 11, at 11.30.

Phillips, J. P., and Sons, builders, 386, Upper Richmond Road, East Sheen. P.E., Wandsworth C.C., Jan. 21, at 12.

Owen, W., builder and joiner, Fourcrosses, Chwilog and Criccieth. P.E., Police Court, Portmadoc, Jan. 25, at 11.30.

Practical Notes for Architectural Draughtsmen.

By ALFRED W. S. CROSS, M.A., F.R.I.B.A.,
and ALAN E. MUNBY, M.A., A.R.I.B.A.

Complete Set Now Ready (27 Large Plates in a Portfolio), 12s.

POST FREE, 12s. 6d.

Prof. C. H. REILLY, of Liverpool University, says: "I think it is a very valuable book, and I hope it will find its way into most architectural offices."

THE "PRACTICAL NOTES" gives in most convenient form for use on the drawing board examples with concise rules, explanations and dimensions for preparing Designs, Perspectives and Working Drawings for Classical Architecture with rapidity and precision.

STUDENTS preparing for the examinations of the R.I.B.A. can learn how to draw The Orders correctly with the smallest possible amount of study and work by utilising the invaluable drawings and data given in this publication.

THE MANAGER, TECHNICAL JOURNALS, LTD.,
Caxton House, Westminster, S.W.

Descriptive Leaflet sent Post Free upon Application.

J. G. HAMMOND & CO., LTD.

PRINTING CONTRACTORS.

LONDON WORKS: 32 to 36, Fleet Lane, Ludgate Circus, E.C.
MIDLAND WORKS: Scotland Passage, High Street, and Moor Street, Birmingham.

SPECIALITY:

CATALOGUES of all kinds,
PUBLICATIONS of all kinds,
BOOKS of all kinds.

LARGE INSTALLATION OF LINOTYPE AND MONOTYPE COMPOSING MACHINERY. ENGLISH, AMERICAN AND FAST ROTARY PRINTING AND FOLDING MACHINERY.

☞ IMITATION TYPEWRITTEN CIRCULARS supplied with names and addresses typed in separately to match the body or alternatively so printed as to enable you to type in the names and addresses on your own typewriter.

SEND FOR ESTIMATES AND UNIQUE TESTIMONIALS.

Publisher's Notices.

Offices: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address: "Buildable, London."

Telephones: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application.

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

*This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

London, W.—Accepted for erection of proposed new public offices at Acton, for the Acton Urban District Council:—

F. G. Minter, High-street Putney £15,608

London.—For erection of new school, Cow Lane, Rotherhithe, for the London County Council:—

G. Parker, Peckham	£16,902	9	3
J. Appleby and Sons, Southwark Park	16,409	0	0
J. Garrett and Son, Balham Hill	16,294	0	0
J. Smith and Sons, Ltd., South Norwood	15,080	0	0
T. D. Leng, Deptford	15,017	0	0
Holliday and Greenwood, Ltd. Brixton	14,866	0	0
W. Johnson and Co., Ltd., Wandsworth Common ...	14,833	0	0
E. Lawrance and Sons, Wharf Road, City Road	14,784	0	0
J. and C. Bowyer, Ltd., Upper Norwood...	14,638	0	0
W. Downs, Hampton Street, Walworth...	14,593	0	0
Kirk and Randall,* Woolwich	14,465	0	0

Architect's estimate, £15,788

*Recommended for acceptance.

Portsmouth.—For erection of a branch police station, etc., at the corner of Eastney-road and Essex Road, Milton, for the Portsmouth Town Council:—

J. Durrant	£1,755
G. J. Davis	1,687
South Western Joinery Co., Gos-port	1,651
H. Jones	1,618
T. W. Quick	1,600
F. Corke	1,586
F. J. Privett	1,530
J. Cockerell...	1,493
J. Tanner	1,490
M. Coltherup,* Lombard Street, Portsmouth	1,470

*Recommended for acceptance.

Rest of Southsea.

Peterborough.—For erection of the Queen's Drive and West Town proposed schools, for the City Education Committee:—

Queen's Drive.

J. Hicks, Huntley Grove ...	£2,856	16	0
D. Gray, Lincoln Road ...	2,826	12	0
G. Brown, All Saints' Road ...	2,753	3	11
T. Measures, Dickens Street...	2,752	12	6
J. Lucas, Dogsthorpe Road ...	2,600	0	0
J. Cracknell, Huntley Grove ...	2,594	0	0
W. Hawkins and Son, Old Fletton	2,565	0	0
J. Gutteridge, Park Road ...	2,549	0	0
J. Bridgefoot and Son,* Oundle Road	2,415	3	8

West Town.

J. Cracknell, Huntly Grove ...	1,789	0	0
T. Furnis, Cromwell Road ...	1,783	0	0
J. Hicks, Huntly Grove ...	1,774	8	0
T. Measures, Dickens Street ...	1,750	0	0
J. Bridgefoot and Son, Oundle Road	1,736	8	0
D. Gray, Lincoln Road	1,734	7	0
H. Watson, Granville Street ...	1,725	0	0
J. T. Crane, Cobden Street ...	1,725	0	0
J. Lucas, Dogsthorpe Road ...	1,690	0	0
G. Brown, All Saints' Road ...	1,632	11	5
J. Gutteridge,* Park Road ...	1,595	0	0

All of Peterborough.

*Recommended for acceptance.

Pontardulais (Wales).—For building new vestry at Hope Chapel. Messrs. J. Davis and Son, architects and surveyors, Cowell House, Llanelly. Quantities by architects:—

T. and J. Brown... ...	£1,750	0	0
Lewis and Morris	1,517	0	0
B. Howell and Son, Ltd. ...	1,479	0	0
Thomas Bros.	1,470	0	0
G. Mercer,* Llanelly	1,439	9	6

*Accepted.

Southgate (Middlesex).—For extension of the Garfield Road Council School, New Southgate, for the Middlesex County Council. Mr. H. G. Crothall, architect to the Middlesex Education Committee:—

Rowley Bros.	£1,820
G. Neal	1,816
W. J. Renshaw	1,815
Treasure and Son	1,775
A. Porter	1,760
Fairhead and Son	1,689
E. Lawrance and Son	1,678
W. Lawrence and Son	1,582
J. Stewart	1,564
Knight and Son,* Tottenham ...	1,444

*Recommended for acceptance.

(*Tenders continued on page viii.*)

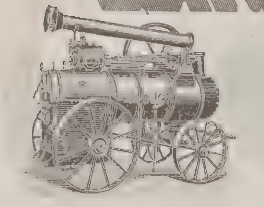
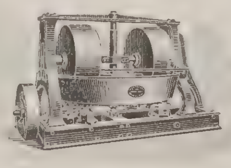
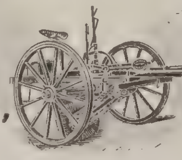
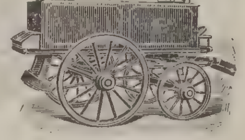
TELEGRAPHIC ADDRESS;
"BARROWS ENGINEERS, BANBURY"

CODES IN USE.—A.I.
A.B.C. 5TH EDITION.
PRIVATE.

TELEPHONE
Nº 59 P.O.

BARROWS & CO. LTD ENGINEERS.

BANBURY
OXON

Portable Engines, 4 to 25 h.p. Combined Engine Boilers and Mortar Mills. Plain Mortar Mills and on Wheels, Street Watering Carts and Vans, Street Sweeping Machines, Dust Vans and Carts, Road Scrapers. Write for full particulars and Catalogues.

PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART

TELEPHONE Nº 9492 Central

MEASURES BROS LTD 53B SOUTHWARK ST LONDON, S.E. & PITLAKE, CROYDON.

TELEPHONE Nº 171 CROYDON

10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.

SECTION SHEETS, BOOKS & PRICES ON APPLICATION.

CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.

STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock.

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork.

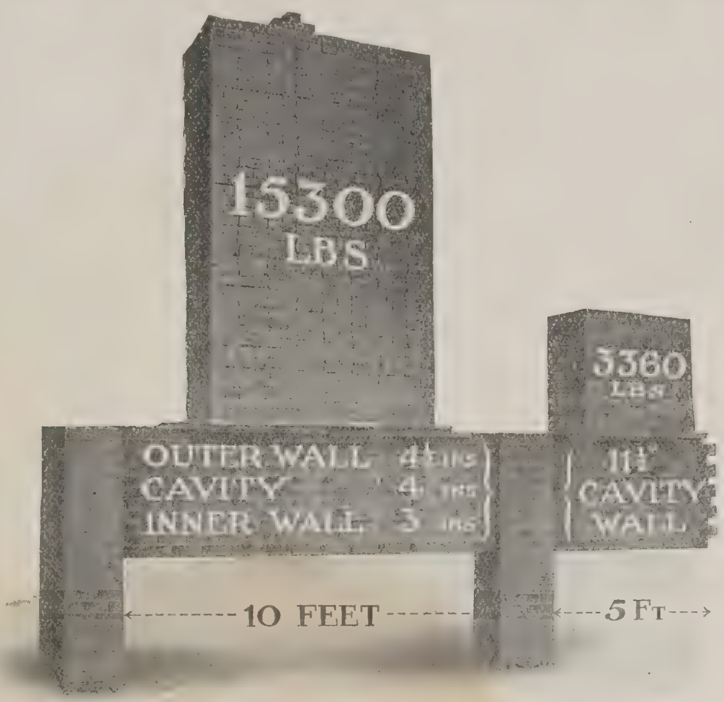
H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

RD. JOHNSON CLAPHAM, & MORRIS, Ltd.,



Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered
Soundproof,
Fireproof
Dampproof,

Architects, Builders, and Contractors *Write for Descriptive Catalogue.*

Engineering Department,
24, Lever Street,
MANCHESTER.

Telegrams; "Metallicus, Manchester."

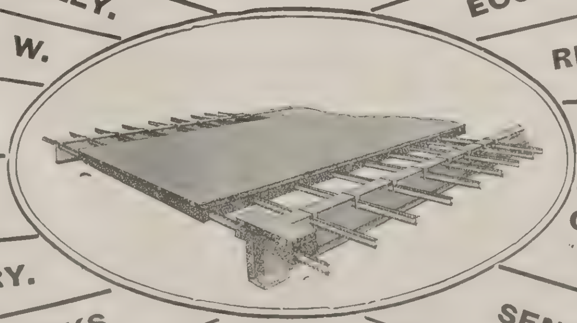
Hollow Wall and Cantilever constructed of 4½ in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

Telephone: 6437 Manchester.

COLUMBIAN FIREPROOFING Co., LTD.

Reinforced Concrete Floors.

RITZ HOTEL, PICCADILLY.
WARING'S, OXFORD ST., W.
ROYAL INFIRMARY, GLASGOW.
"MORNING POST," STRAND.
LAMBETH DISTILLERY.
50 Repeat Orders for L. C. M. BANKS.



ECONOMICAL CONSTRUCTION.
RIGID AND SOUNDPROOF.
SAVING IN COST.
OWNERS & ARCHITECTS ENTIRELY SATISFIED.
SEND FOR PARTICULARS.

"COLUMBIAN" System.

37, KING WILLIAM STREET, LONDON, E.C.

A.W.E.

TEL. NO. 5060 BANK.

(Tenders continued from page vi.)

Bledlow Ridge (Bucks.).—For erection of a detached house at Bledlow Ridge, Bucks., for Mr. Frederick Burdett. Mr. S. C. Hart, architect, 26, Bush Lane, E.C. :—

Webster and Hawkes	£1,390	0	0
Webster and Cannon	1,288	0	0
Kingerlee and Co.	1,195	0	0
Hunt and Sons	1,113	0	0
Walis and Co.	1,004	18	10
Shellard and Co.	987	0	0
Thomson and Co.*	958	0	0

*Accepted.

Cheltenham.—For hospital extension, for the Governors of the Cheltenham General Hospital :—

R. R. Skemp	£3,645
C. H. Channon and Sons	3,385
E. Saunders and Son	3,325
W. T. and R. A. Hunt	3,150
A. C. Billings and Sons	3,077
Collins and Godfrey*	2,994

*Accepted.

Goodmayes (Essex).—For erection of Parish Hall and boundary wall, All Saints, Goodmayes. Mr. Percy K. Allen, architect, Tunbridge Wells; Mr. S. Cecil Addison, surveyor, 30, Honor Oak Park, S.E. :—

J. Grover and Son	£2,734
G. J. Hosking	2,631
J. T. Luton	2,629
E. Lawrence and Sons	2,557
A. E. Symes	2,550
F. W. Jarvis	2,525
C. Miskin and Sons	2,525
J. Jarvis and Son	2,468
J. S. Hammond and Son	2,430
J. W. Jerram	2,399
Dowsing and Davis	2,274
F. and A. Willmott*	2,162

*Accepted.

Gowerton (Wales).—For rebuilding Gower Inn, Gowerton, for Messrs. Buckley Brewery, Ltd., Llanelly. Messrs. J. Davies and Son, M.S.A., A.M.I.C.E., architects, Llanelly :—

B. Howell and Son, Ltd.	£7,407
Walters and John's	1,185
G. Mercer,* Llanelly	1,170

*Accepted.

Haslemere.—For alterations and additions to bank premises, for F. R. Ballard, Esq. Messrs. Hodgson and Symmonds, architects, Guildford and Haslemere :—

R. Smith	£419	0	0
C. Daughton	376	16	0
Holden	376	0	0
Austin*	320	5	0

*Accepted.

Hinckley.—For construction of settling tanks, ejector chamber, carriers, screening chamber, and engineering work, for the Urban District Council :

W. Sharpe, Leicester	£2,779	19	0
J. Macdonald, Westminster ...	2,740	16	11
C. Chamberlain, Leicester ...	2,686	0	0
G. Greaves, Hinckley	2,645	19	0
S. Chaplin, Stoke Golding ...	2,518	5	6
Firth and Co., Leicester	2,508	2	8
E. Fox, Leicester	2,468	0	0
J. Cunliffe, Birmingham ...	2,455	19	5
A. Palmer, Leicester	2,447	15	0
B. Firth, Harrogate	2,436	2	5
A. Jewell,* Market Harborough	2,389	15	9

*Accepted.

Irchester (Northants).—For erection of a Carnegie Free Library, for the Irchester Parish Council. Messrs. Sharman and Archer, architects, Wellingborough :—

W. Stevens, Wellingborough ...	£994	0	0
Swannell and Tarlington, Rusharn	989	10	0
E. Archer and Sons, Ltd., Northampton	985	0	0
R. Marriott, Rushden	985	0	0
C. E. Bayes, Rushden	979	0	0
Hacksley Bros., Wellingborough	975	0	0
Goodman and Murkett, Wellingborough	967	0	0
T. Hickman, Market Harborough	966	11	0
G. Henson and Son, Wellingborough	950	0	0
E. Brown and Son, Ltd., Wellingborough	941	5	0
Phillips and Slow, Kettering ...	880	0	0
W. Packwood,* Rushden	850	0	0

*Accepted.

Leyton.—Accepted for extension of the municipal offices, Messrs. J. T. Newman and Jacques, architects. Quantities by C. Stanger and Son :—North Bros., Stratford, £8,486 19s. 2d.

London.—For erection of new fire-station in Foxley Road, Camberwell New Road, for the London County Council :—

H. Lovatt, Ltd., Wolverhampton	£8,194	0	0
Holloway Bros. (London), Ltd., Belvedere Road, S.E.	7,900	0	0
C. Wall, Ltd., 4, Lloyd's Avenue, E.C.	7,874	10	0
H. L. Holloway, Deptford, S.E.	7,684	0	0
Leslie and Co., Ltd., Kensington Square, W.	7,610	0	0
F. and H. F. Higgs, Loughborough Junction, S.E. ...	7,600	0	0
F. and T. Thorne, Isle of Dogs, E.	7,473	0	0
W. Johnson and Co., Ltd. Wandsworth Common, S.W. ...	7,285	0	0
J. Barker and Co., Ltd.,* 83, Kensington High Street, W.	7,276	0	0
T. Dent and Sons, Hibson Road, Nelson	£8,227	6	0

Architect's revised estimate, £7,450.

* Recommended for acceptance.

Recommended for acceptance.

Leyton.—Accepted for erection of Sybourn Street elementary school, first block for 390 boys and 390 girls. J. T. Newman and Jacques, architects. Quantities by J. Rider, Hunt and Co. :—F. J. Coxhead, Leytonstone, £10,647 8s.

London.—For extension of the Paddington Technical Institute, for the London County Council :—

C. Wall, Ltd., Lloyd's Avenue ...	£7,617
H. L. Holloway, Church Street, Deptford	7,606
Leslie and Co., Ltd., Kensington Square	7,594
J. and C. Bowyer, Ltd., Upper Norwood	7,574
J. Barker and Co., Ltd., Kensington	7,480
W. H. Smith and Son, Harleyford road	7,390
Patman and Fotheringham, Ltd., Islington	7,323
Kirk and Randall, Woolwich	7,300
Holloway Bros. (London), Ltd., Belvedere Road	7,300
F. and H. F. Higgs, Herne Hill ...	7,290
E. Lawrence and Sons,* Wharf Road, City Road	7,052

*Recommended for acceptance.

Lancing.—Laying 6 in., 4 in. and 3 in. cast-iron mains for the purpose of supplying the parish of Lancing with water, for the Brighton Corporation. Mr. James Johnston, M.I.C.E., waterworks engineer :—

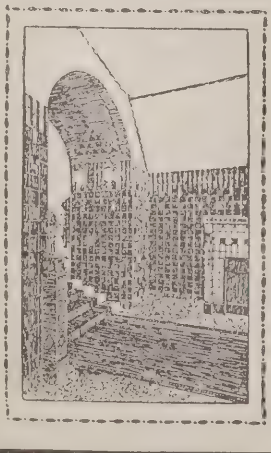
W. H. Holman and Co., 101-152, Lewes Road, Brighton	£1,389	10	0
Rowling, Sons, and Co. 7, Quality Court, Chancery Lane, W.C.	1,351	12	10
W. J. Burstow, 16, Gloucester Place, Brighton	1,252	0	0
F. Langley and Westmoreland, Kirton, Boston	1,199	18	4
J. and F. Hanney Bros., Britannia House, Morriston, Swansea	1,137	7	0
F. E. Smith and Co., 4, Unity Street, College Green, Bristol	1,098	10	0
E. H. Bate and Co., Slough, Bucks ...	1,068	19	2
Sir Jno. Aird and Sons, Belvedere Road, Lambeth, S.E.	996	4	2
A. E. Nunn and Co., Ltd., Finsbury House, Blomfield Street, E.C. ...	977	2	6
James and Co., 38, Gardner Road, Guildford	972	7	6
J. Riley, Gloucester Road, Cheltenham	911	2	6
Bostel Bros., Ltd.,* 18 and 19, Duke Street, Brighton	906	6	8
Pedrette and Co., Queen's Road, Finsbury Park, N.	892	19	2

*Accepted.

Trawden, near Colne (Lancs.).—For erection of proposed new elementary school at Trawden, near Colne :—

'SCHOLA' HOOK
(Regd.)
200 Schools
200,000
Hooks.
Lists & Estimate Free.
Sole Maker
Brookes & Co. (LTD.),
4, CATEATON ST
MANCHESTER.

WRITE TO THE MANUFACTURERS.
BAYLISS, JONES & BAYLISS, LTD.
FENCING GATES, ETC.
WOLVERHAMPTON & LONDON.
LOW PRICES. CATALOGUES FREE. (NAME THIS JOURNAL.)



"Modernia" Patent Glass Tiles
give an artistic and novel effect.
No glassy surface. Coloured throughout. Substance about ¼ inch. Any colour supplied. Prospectus, Samples, Estimates and Designs for complete decorations, free.
The "Modernia" Patent Glass Tile Co.
Sole Concessionaires: Aug. Brennecke & Co., 68 Finsbury Pavement, London, E.C.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Jan. 7. WINDSOR.—Repairing the two Mortuary Chapels, in the Windsor Cemetery, for the Town Council. The specification may be seen and forms of tender obtained upon application at the office of E. A. Stickland, borough surveyor, Alma Road, Windsor. Tenders to be sent in to E. C. Durant, town clerk, 3, Park Street, Windsor, on the forms supplied, and endorsed "Repairs at Cemetery," not later than Jan. 7.

Jan. 7. BRIDLINGTON.—Erection and completion of the Burlington Schools and Caretaker's Residence, for the Borough Education Committee. Drawings, specification, and conditions of contract may be inspected, and bills of quantities and form of tender may be obtained at the office of J. Earnshaw, architect and surveyor, Carlton House, Bridlington, upon payment of a deposit of £2 2s. Sealed tenders, endorsed "Tender for Bridlington Schools, Contract No. 1," to be delivered at the architect's office not later than ten o'clock a.m. on Jan. 7.

Jan. 8. MURLOG (Ireland).—Erection of a schoolhouse at Murlog, Parish of Clonleigh, according to plans and specification prepared by the Commissioners of National Education and the Board of Works, and to be seen at the Parochial House, Strabane. Tenders to be lodged with Rev. John Doherty, P.P., by Jan. 8.

Jan. 9. LLANBRADACH.—Building of a chancel, vestry, and tower at All Saints' Church, Llanbradach, for the Rev. Edwin Edwards. The plans may be seen at the office of E. M. B. Vaughan, F.R.I.B.A., architect, Cardiff, and quantities supplied. A deposit of £2 2s. will be required. Tenders, sealed and endorsed, to be sent to the architect on or before noon on Jan. 9.

Jan. 9. BANDON.—Erection of 143 single cottages, with fencing of an acre plot of land to be attached in every case, at a cost not exceeding £130 per cottage and plot, for the R.D.C. A deposit of £2 per cottage must be lodged with each tender and an official acknowledgment obtained therefor. Conditions of contract and any other particulars required, as well as tender forms, can be had on application from A. Haynes, clerk of District Council, Council Office, Workhouse, with whom tenders should be lodged not later than 11 a.m. on Jan. 9.

Jan. 9. BANDON.—Fencing nine additional half-acre allotments to existing cottages, at a cost not to exceed 12s. 6d. per perch, for the R.D.C. A deposit of 10s. per plot must be lodged with each tender and an official acknowledgment obtained therefor. Conditions of contract and any other particulars required can be had on application to A. Haynes, clerk of District Council, Council Office, Workhouse, with whom tenders should be lodged not later than 11 a.m. on Jan. 9.

Jan. 9. LONG EATON.—Erection of proposed Council Schools at Long Eaton for the Derbyshire Education Committee, to accommodate 960 children in three blocks for boys, girls, and infants, with cookery and manual instruction rooms. Persons desirous of tendering for the work may see the drawings, specification, agreement, etc., at the office of the architect to the Committee, St. Mary's Gate, Derby, between the hours of 10 a.m. and 4 p.m., except on Saturdays when they will be on view from 10 a.m. to 12 noon. A copy of the bill of quantities, specification, conditions of contract and form of tender can be obtained at the architect's office upon payment of £1 1s. Sealed tenders, in envelopes provided for the purpose, endorsed "Tender for Long Eaton School" must be delivered to G. H. Widdows, architect to the Committee, County Education Office, St. Mary's Gate, Derby, not later than Jan. 9, at 1 p.m. Securities required.

Jan. 11. BISHOP AUCKLAND.—Proposed extensions to the Lady Eden Cottage Hospital, Bishop Auckland. Plans and specifications may be seen, and full particulars obtained at the office of F. H. Livesay, architect and surveyor, Bishop Auckland, up to Jan. 11, on or before which date sealed tenders, properly endorsed "Lady Eden Cottage Hospital Extension," are to be sent to Dr. T. A. McCullagh, Bishop Auckland.

Jan. 11. EBBW VALE.—Stripping, boarding, elting and re-slating the roofs of the Victoria Schools, together with various jobbing works, for he Education Committee. Further information may be obtained on application to H. Waters, architect, Market Chambers, Ebbw Vale. A deposit of £1 1s. will be required from all persons making application for schedule. Tenders enclosed in a sealed envelope endorsed on the outside "Tender for Victoria Schools," should be delivered at the office of T. Hughes, secretary, Ebbw Vale, on or before Jan. 11.

Jan. 12. ABINGDON.—Erection of New Station Buildings at Abingdon, for the Directors of the Great Western Railway Co. Plans and specifications may be seen, and forms of tender and bills of quantities obtained at the office of the engineer at Paddington Station, between the hours of 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for Works at Abingdon," will be received on or before Jan. 12.

Jan. 13. MORLEY.—Alterations and additions to Peel Street Mills, Morley. Plans and specifications may be seen and quantities obtained of T. A. Buttery, F.I.A.S., architect, Queen Street, Morley, on Jan. 6. Sealed and endorsed tenders to be sent to him not later than 4 p.m. on Jan. 13.

Jan. 13. ROTHERHITHE.—Partial reconstruction of and additions to the Desiccated Grains Company's Factory, Rotherhithe. Plans and specifications (no quantities) may be seen on application to the Works Manager at the Company's premises, 199, Rotherhithe Street, Rotherhithe. Sealed tenders, endorsed "Tender, Desiccated Factory," to be delivered before 12 noon on Jan. 13 at the offices of Wreford and Wright, architects, 317, High Holborn, W.C.

Jan. 14. SNEATON, near Whitby.—Alterations in Chancel, for re-seating and other works at the Parish Church of Sneaton, near Whitby. The plans and specifications may be seen at the Architect's office, and persons desirous of tendering for the work are requested to send in their names to E. H. Smales, architect, 5, Flowergate, Whitby, who will furnish them with the bill of quantities when ready; and tenders are to be sent to him before noon on Jan. 14.

Jan. 14. CHESTER.—Building a Battery Room and other extensions at the Electricity Works in New Crane Street. Plans and specifications can be seen at the office of the city surveyor, Town Hall, Chester, and bills of quantities obtained on deposit of £1. Tenders enclosed in sealed envelopes, endorsed on the outside "Tender for Electricity Works Extension," and addressed to J. H. Dickson, town clerk, Town Hall, Chester, are to be delivered not later than 10 a.m., on Jan 14.

Jan. 15. CANTERBURY.—Plastering, repairs, painting, etc., to Ward A2 Male at the Kent County Lunatic Asylum, Chartham Down, near Canterbury. Persons desirous of tendering may obtain a copy of the bills of quantities and see the plans and specifications at the office of W. J. Jennings, architect, 4, St. Margaret's Street, Canterbury, on payment of the sum of £5. Tenders to be sent to the chairman of the Committee on the forms provided, and to be delivered at the asylum not later than 10 o'clock on the morning of Jan. 15.

Jan. 16. BLAINA.—Erection of a new mixed and infants' school at Blaina, to accommodate 510 scholars, for the Monmouthshire Education Committee. Plans and specification may be seen at the County Council Offices, Newport. Quantities supplied on deposit of £3 3s. Sealed tenders, endorsed "Tender, Blaina School," are to be delivered to C. Dauncey, secretary, County Council Offices, Newport, Mon., not later than Jan. 16.

Jan. 16. OLD FLETTON (Hunts.).—Erection of a commercial and technical school at Old Fletton, for the Hunts. Education Committee. Persons desirous of tendering can see plans and specifications at the offices of the County Surveyor, High Street, Huntingdon, and quantities can be obtained on payment of £2 2s. Tenders to be delivered to S G. Cook, clerk to the Education Committee, County Education Offices, Huntingdon, by 10 a.m. on Jan. 16.

Jan. 18. MACCLESFIELD.—Erection of two Detached Blocks for 45 patients each, at the Parkside Asylum, Macclesfield. Plans and specifications can be seen at the office of H. Beswick, F.R.I.B.A., county architect, Chester, on and after December 14, and quantities obtained on deposit of £1. Tenders are to be delivered to A. C. Proctor, clerk to Visitors, 23, King Edward Street, Macclesfield at or before 10 a.m., on Jan. 18, endorsed "Tender for Detached Blocks, Parkside Asylum."

Jan. 18. KINGSTON-ON-THAMES.—Making a small addition to the Union Offices, Coombe Lane, Kingston-on-Thames, for the Guardians of the Kingston Union. Plans and specification may be seen and bill of quantities and form of tender obtained on application to H. Hope, C.E., architect, 12, Clarence Street, Kingston-on-Thames. Tenders to be delivered to C. W. Dash, clerk, Union Offices, Coombe Lane, Kingston-on-Thames, not later than Jan. 18, endorsed "Tender for Additions to Offices." Fair wages clause.

Jan. 18. HUNSLET (Leeds).—Bricklayer's, joiner's, plumber's, plasterer's, slater's and painter's work required in the erection of the Council's new offices in Leek Street, Hunslet, for the R.D.C. Contractors may tender either for the whole or any one of the trades. Application for specifications and quantities, accompanied by a deposit of 10s. 6d., must be made to B. W. Higgins, architect, Oulton, near Leeds, and tenders endorsed "Tender for New Offices," must be sent to W. B. Pindar, clerk, Glasshouse Street, Hunslet, Leeds, not later than Jan. 18.

Jan. 19. SEAHAM.—Erection of Temporary Council Schools at Seaham Harbour, alterations and improvements at Middlestone Moor, South Frosterley, Easington Lane, and Hedley Hill Council Schools. Plans, specifications, and general conditions of contract may be seen and bills of quantities obtained (for Middlestone Moor and Seaham Harbour Council Schools only), at the office of F. E. Coates, Shire Hall, Durham. Sealed tenders (endorsed with name of school) are to be sent to A. J. Dawson, clerk to the Education Committee, Shire Hall, Durham, on or before Jan. 19.

Jan. 19. LONDON, W.—Erection of branch Post Office and Meteorological Office, South Kensington (2nd contract—Superstructure), for the Commissioners of H.M. Works and Public Buildings. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to Sir Henry Tanner, F.R.I.B.A., H.M. Office of Works, etc. Bills of quantities and forms of tender may be obtained at H.M. Office of Works, on payment of £1 1s. Tenders must be delivered before 12 o'clock noon on Jan. 19, addressed to the Secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., and endorsed "Tender for New Branch Post Office, etc., South Kensington."

Jan. 21. LONDON, N.—Provision of improved Receiving Ward accommodation at the St. John's Road Workhouse, Upper Holloway, N., for the Guardians of the Poor of the Parish of St. Mary, Islington, in accordance with plans, specification, and conditions of contract, which may be seen up to Jan. 16, on application to their architect, W. Lockwood, of 12, Sherwood Street, Piccadilly Circus, London, W. A copy of the bills of quantities can also be obtained of him upon depositing £5 5s. Tenders must be sealed up in the envelope supplied, addressed to the Guardians and delivered at the offices of E. Davey, clerk, Guardians' Offices, St. John's Road, Upper Holloway, N., not later than 12 noon on Jan. 21, and the same will be opened at a meeting of the Guardians on the same day. Securities required.

No date. TIPPER.—Erection of a new residence at Tipper, Naas, Co. Kildare. Plans, specifications, etc., may be seen at the offices of G. L. O'Connor, M.R.I.A.I., architect, 42b, Great Brunswick Street, Dublin.

No date. PWLLHELI.—Enlargement of Pwllheli Church. Builders wishing to submit estimates for the work are requested to send their names, with references, to J. Oldrid Scott and Son, architects, 2, Dean's Yard, Westminster, S.W.

ENGINEERING.

Jan. 7. BRIDLINGTON.—Heating the Burlington Schools with hot water (low pressure), for the Borough Education Committee. Drawings, specification, and conditions of contract may be inspected at the office of J. Earnshaw, architect and surveyor, Carlton House, Bridlington, (quantities not supplied). Sealed tenders, endorsed "Heating Contract No. 2," are to be delivered at his office not later than 10 o'clock a.m. on Jan. 7.

Jan. 9. LLANGYNWYD MIDDLE.—Construction of Works of water supply in the parish of Llangynwyd Middle, for the Penybont R.D.C (Bridgend). Plans can be seen and specification, quantities, and forms of tender (which alone must be used) can be obtained from W. J. Davies, surveyor, Felin Fach, Tondu, upon payment of £1 1s. Sealed tenders, endorsed "Llan Water Works," to be received by R. H. Cox, Union Offices, Bridgend, not later than Jan. 9.

Jan. 9. BLEAN (Canterbury).—Supply of an eight nominal horse-power, horizontal, non-condensing steam engine, on strong box-girder bedplate, with necessary holding-down bolts and plates, high speed governors, sight-feed lubricator on steam cylinder, feed pump, starting valve, regulating valve, and all bearings to be fitted with gunmetal oil cups, for the Guardians. Also one "Royle" feed-water heater, the whole to be supplied and delivered, free of charge, to the Guardians at the Workhouse, Herne Common, near Herne Bay. Any further information required may be obtained of the Master of the Workhouse. Tenders and drawings to be delivered at the office of J. E. Burch, clerk, 39, Castle Street, Canterbury, by Jan. 9.

Jan. 18. GLASGOW.—Construction of the Works in the Counties of Stirling and Perth, authorised by the Glasgow Corporation (Water and General) Order, for raising the level of Loch Arklet and conveying water therefrom to Loch Katrine. Copies of the specification, schedule of quantities, and form of tender, together with prints of the drawings, may be obtained from J. R. Sutherland, the engineer to the Water Department, 45, John Street, Glasgow, upon payment to the Water Treasurer, 45, John Street, Glasgow, of £10 10s. The resident engineer will meet intending contractors on the site of the works, at 10 a.m. on Jan. 6 and 7. Sealed offers, marked "Water Department—Tender for Loch Arklet Works," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, on or before 12 o'clock noon, on Jan. 18.

Jan. 19. LONDON, W.—Altering Lifts and Fans at present worked by continuous current lifts and 2 fans to work from single-phase alternating current and 2 fans to work from steam engine. Schemes and tenders are invited by the Parish of Hammersmith. Firms tendering to specify what allowance they are prepared to make for present transforming plant and continuous current motors. Drawings, detailed specifications, etc., to be supplied free of cost to the Guardians. Tenders, endorsed "Tender for Altering Lifts, etc.," to be delivered before Jan. 19, to J. Lamb, clerk to the Guardians, 206, Goldhawk Road, Shepherd's Bush, from whom specification can be obtained.

Jan. 20. CAIRO.—Supply of a universal milling machine (machine à fraiser) required by the Khedival School of Arts and Trades. Tenders must be made on stamped paper of 3 Egyptian piastres (obtainable from Lt.-Colonel Western, C.M.G., Queen Anne's Chambers, Broadway, Westminster, S.W.), and should be accompanied by full particulars and plans, etc., of the machine offered. They should be addressed to the Director of the School of Arts and Trades, Cairo, where they will be received up to noon on Jan. 20. Tenders should be endorsed "Offre pour fourniture d'une machine à fraiser." The copy of the specifications and conditions mentioned above (in French) may be examined by British makers on application at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Jan. 26. LONDON, S.W.—Laying of stoneware cable-ducts, for the L.C.C. Full particulars, and also information as to the conditions to be observed by tenderers, will be found in the "London County Council Gazette" of Jan. 4 and subsequent issues. Tenders must be upon the official forms to be obtained from the clerk of the Council, County Hall, Spring Gardens, S.W., upon payment to the cashier of the Council of the sum of £2 for the specification, etc. Full particulars of the work may be obtained on application at the County Hall, before the payment of the fee for the specification, etc. No tender received after 11 a.m. on Jan. 26. will be considered.

March 1. CAIRO.—Construction of a floating dock for the Administration og the Egyptian State Railways. Specifications, price 10s., may be obtained from Lt.-Colonel Western, C.M.G., Queen Anne's Chambers, Broadway, Westminster, London, S.W. Tenders will be received by the General Manager, Egyptian State Railways, Cairo, up to noon on March 1

IRON AND STEEL.

Jan. 7. MANCHESTER.—Erection of Iron Railings and Fencing at Hulme Hall Lane, Ten Acres Lane, and Manley Park Recreation Grounds, for the Parks and Cemeteries Committee. Drawings may be seen and specification, bill of quantities, and form of tender obtained on application at the City Surveyor's office, Town Hall, Manchester, on payment of £2 2s. All cheques or postal orders are to be made payable to the order of "The Corporation of Manchester." Tenders, enclosed in the official envelope, addressed to the chairman of the Parks and Cemeteries Committee, are to be delivered at the city surveyor's office not later than 10 a.m. on Jan. 7.

Jan. 11. NEW MALDEN.—Supplying and Erecting about 581 yds. lin. of Unclimable Iron Fencing, together with 3 pairs of gates, on the Fencing Recreation Ground, Station Estate, New Malden, in accordance with plans and specification prepared by R. H. Jeffes, engineer and surveyor to the Council. The plans and specification can be seen and bills of quantities obtained on application to the surveyor during office hours, upon deposit of the sum of £4 4s. Sealed tenders, endorsed "Fencing Recreation Ground," and addressed to J. W. Johnson, clerk to the Council, Council Offices, New Malden, Surrey, to be delivered not later than 6 p.m. on Jan. 11.

Jan. 12. BARNSLEY.—Supply of about 1,600 yds. of 20in. diameter Cast Iron Socketted Pipes and Special Castings for the Town Council. The drawings can be seen and the specification, conditions, and bills of quantities may be obtained on application to J. H. Taylor, borough surveyor, engineer for the Works, Manor House Offices, Barnsley, on payment of £3 3s. to J. F. Burn, borough accountant, Manor House Offices, Barnsley. The tenders are to be delivered, properly endorsed, to H. Horsfield, town clerk, Church Street, Barnsley, not later than 10 a.m. on Jan. 12.

Jan. 16. SOUTHGATE.—Supply and delivery of 260 yds. of unclimbable iron fencing. Specification and full particulars can be obtained from C. G. Lawson, the council's surveyor, at the Council Offices. Sealed tenders to be delivered to W. M. Ellenor, clerk, Council Offices, Palmer's Green, N., not later than Jan. 16.

Jan. 19. ADELAIDE (South Australia).—Supply and delivery of 4,200 tons of steel rails, 80lbs. per lin. yd.; 1,500 tons of steel rails, 60lbs. per lin. yd.; 1,900 tons of steel rails, 50lb. per lin. yd.; 286 tons of steel fishplates for 80lb. rails; 100 tons of steel fishplates for 60lb. rails; and 120 tons of steel fishplates for 50lb. rails. Drawings and specification can be seen, and forms of tender obtained, at the Supply and Tender Board Office at Adelaide, where copies of drawings and specifications may be purchased at 10s. per set. Drawings and specification may also be inspected at the office of S. E. Strickland, the South Australian Inspecting Engineer in London, 64, Victoria Street, S.W. Tenders should be endorsed "Tender for Rails and Fishplates," and delivered to the Supply and Tender Board Offices, Adelaide, by 3 p.m. on Jan. 19.

Jan. 26. BELFAST.—Supply and Delivery in the Permanent Way Yard, Duncrue Street, Belfast, for the Midland Railway, of (a) Fish-plates, and (b) Bottom Plates:—(a) 32 tons of section 40, weight per pair 14lb. to 16lb. (approx.), cut to specified lengths; 50 tons of section 42, weight per pair 18lb. (approx.).; 59 tons of section 46, weight per pair 15½lb. (approx.); and alternatively for half of each of above quantities, with, in addition, 150 tons of section 65, weight per pair 50lb. (approx.); (b) 25 tons of 8in. by 8in. plates; 25 tons of 9in. by 7in. plates, and alternatively for half of each of above quantities. The whole to be of British manufacture throughout. Copies of the drawings (a and b) and forms of tender can be obtained from J. Cowie, secretary of Committee, York Road Terminus, Belfast. Proposals to be sent in sealed envelope, endorsed "Tender for Fish-plates, etc.," and addressed to the chairman of Committee at Belfast, so as to be with him on or before Jan. 26.

PAINTING.

Jan. 13. LEEDS.—Painting, etc., the exterior of property in Trafalgar Street, Nile Street, etc. The specification may be seen and forms of tender obtained at the office of W. T. Lancashire, city engineer, in the Municipal Buildings. Tenders, properly endorsed, must be received at the town clerk's office not later than 10 a.m. on Jan. 13.

Feb. 2. MANCHESTER.—Painting at the under-mentioned places, for the Directors of the Lancashire and Yorkshire Railway. 1, from Southport (Central) to Preston; 2, Wigan to Southport; 3, at Blackburn; 4, Burnley to Todmorden; 5, at the carriage and waggon works, Newton Heath; 6, Newton Heath to Rochdale, and the Middleton branch; 7, Rochdale to Sowerby Bridge; 8, Sowerby Bridge to Mirfield and at Dewsbury Junction; 9, at Bradford; 10, at Hull. Specifications and separate forms of tender may be obtained on personal application at the engineer's office, Hunt's Bank, Manchester. Tenders, endorsed "Tender for Painting," to be in the hands of R. C. Irwin, secretary, Hunt's Bank, Manchester, not later than 10 o'clock on the morning of Feb. 2.

PLUMBING & SANITARY

Jan. 11. NEW MALDEN.—Constructing about 879ft. run 9in. and 802ft. run 12in. Pipe Sewer, together with manholes, ventilating shafts, etc., in Kingston Road, New Malden, for the Maldens and Coombe U.D.C., in accordance with plans and specification prepared by their engineer and surveyor, R. H. Jeffes. The plans and specification can be seen, and bills of quantities obtained on application to the surveyor during office hours, upon deposit of the sum of £5 5s. Sealed tenders, endorsed "Sewer—Kingston Road," and addressed to J. W. Johnson, clerk to the Council, Council Offices, New Malden, Surrey, to be delivered not later than 6 p.m. on Jan. 11.

Jan. 12. BARNSLEY.—Excavating, Laying, and Jointing of about 1,600 lin. yds. of 20in. diameter Cast Iron Socketted Pipes and Special Castings, and for the driving of headings and the construction of a tunnel and screening chambers, sewage well, brick sewers, and other works connected therewith for the Town Council. The drawings can be seen and the specification, conditions, and bills of quantities may be obtained on application to J. H. Taylor, borough surveyor, engineer for the Works, Manor House Offices, Barnsley, on payment of £3 3s. to J. F. Burn, borough accountant, Manor House Offices, Barnsley. Tenders, properly sealed and endorsed, are to be delivered to H. Horsfield, town clerk, Church Street, Barnsley, not later than 10 a.m. on Jan. 12.

Jan. 13. SELLY OAK. — Re-drainage of the houses numbered 11 to 20, Lime Avenue, Dawlish Road, Selly Oak, and 133a, Dawlish Road, Selly Oak, for the King's Norton and Northfield U.D.C. Forms of tender and specification of the work may be obtained from A. W Cross, A.M.I.C.E., 23 and 25, Valentine Road, King's Heath. Tenders, endorsed "Tender for Re-drainage of Lime Avenue, Selly Oak," to be received at the office of E. Docker, clerk to the Council, 10, Newhall Street, Birmingham, not later than 10 o'clock in the forenoon on Jan. 13.

Jan. 15. BELFAST.—Carrying out a scheme of sewerage and sewage disposal works for Glengormley, Whitewell, Ballygolan, and Upper and Lower Whitehouse, for the R.D.C., in accordance with plans and specification which can be seen at the office of J. W. Robb, clerk to the R.D.C., Council Office, Union Workhouse. Bills of quantities, etc., can be purchased at this office at a cost of £1 1s. per copy. Tenders to be lodged in the tender-box, Council Office, Workhouse, Belfast, before 2 o'clock p.m. on Jan. 15. Securities required.

Jan. 18. THURNSCOE.—Alterations and improvements at the Thurnscoe Sewage Disposal Works, comprising secondary contact beds, sludge well, sludge filters, storm water carrier, and laying out land filtration area, for the U.D.C. Plans and specifications may be seen, and quantities obtained from H. Smith, engineer, Compton Buildings, Bow Street, Keighley. A copy of the plans may also be seen at the surveyor's office, Thurnscoe. Tenders to be delivered to J. L. Hawksworth, clerk to the Council, Rotherham, not later than Jan. 18, endorsed "Sewage Works."

Jan. 20. BEXLEY.—Supply and Delivery of best Glazed Stoneware Socketted Pipes for the year ending March 31, 1910, for the U.D.C. Specification and form of tender can be obtained upon application to W. T. Howse, surveyor to the Council. Sealed tenders, endorsed "Tender for Pipes," must be sent to T. G. Baynes, clerk to the Council, Council Offices, Bexley Heath, not later than 10 a.m. on Jan. 20.

Jan. 21. LEEDS.—Execution of the following sewerage works, for the Sanitary Committee: (1) Hyde Terrace. (2) Kirkstall Lane. (3) Beeston, near Royds. (4) Coal Hill Lane. Drawings may be seen and forms of tender, with copies of the documents forming the contract, may be obtained on and after Jan. 7, on application to W. T. Lancashire, city engineer, Municipal Buildings, Leeds, on payment of a deposit of £3 3s. Tenders must be on the official form, enclosed in a sealed cover and endorsed "Sewerage Works," addressed to the town clerk, and delivered at the Town Hall, Leeds, not later than 10 a.m. on Jan. 21.

Jan. 21 CUCKFIELD.—Construction of about 3,600 lin. yds. (including about 800 lin. yds. in heading) of 9in. and 5,650 lin. yds. of 8in. diameter Stoneware Pipe Sewers; about 290 lin. yds. of 9in., 50 lin. yds. of 8in., 75 lin. yds. of 6in., and 225 lin. yds. of 4in. Cast-iron Pipe Sewers; culvert extensions, stream diversions, 2 circular tanks to hold 10,000 gallons, 3 sprinkler beds; screening, distributing, and valve chambers, drains, access road, etc., in the parishes of Balcombe and Cuckfield Rural, for the R.D.C. Plans and sections of the proposed works may be seen and specifications and bills of particulars, together with forms of tender, may be obtained on application to Strachan and Weeks, civil engineers, 9, Victoria Street, Westminster, London, on payment of a deposit of £3 3s. by cheque. Sealed tenders, endorsed "Tenders for Sewerage Works," are to be delivered at the office of C. H. Waugh, clerk, Hayward's Heath.

ROADS AND CARTAGE.

Jan. 7.. PINNER.—Kerbing, Channelling, Paving, Making-up, etc., the following roads in the parish of Pinner, for the Hendon R.D.C.:—Royston Park Road (2nd section), Royston Park Estate; Oakleigh Road, Royston Park Estate; Pinner Chase, Chase Estate; Station Road, Chase Estate. The conditions of contract and plans and specifications of the above work may be seen at the office of J. A. Webb, engineer and surveyor to the Council, Stanmore, where schedule of quantities and forms of tender can be obtained on deposit of £5. Sealed tenders, endorsed "—— Road," to be addressed to the chairman, R.D.C. of Hendon, Union Offices, Edgware, and delivered not later than 10 a.m. on Jan. 7.

Jan. 8. MANCHESTER.—Execution of the work named in the under-mentioned streets and passages, for the Paving, Sewering and Highways Committee. Sewering, draining, paving, etc., Ilkley Street, Moston; Harrow Street, Crumpsall; Newland Street, Crumpsall; and passage behind 118-130, Droylsden Road, 1-49, Melrose Street, 2-44, Hethorn Street, 29-43, Culcheth Lane, and adjoining 2 and 44, Hethorn Street, and 1, 27, 29, and 49 Melrose Street, Newton Heath; passage behind 96-102, Droylsden Road, 2-8, Coniston Street and adjoining 2 and 8, Coniston Street, Newton Heath; and passage behind 104-116, Droylsden Road, 1-17, Coniston Street, 1-35, Hethorn Street, 21-27, Culcheth Lane, and adjoining 1 and 17, Coniston Street, and 1 and 35, Hethorn Street, Newton Heath, North Manchester. Forms of tender may be obtained on application to the Paving, etc., Department (surveyor's office), and must be returned to the chief clerk, Paving, etc., Department, Town Hall, Manchester, not later than 10 a.m. on Jan. 8, 1909. Also they are prepared to receive on or before Jan. 9, tenders for the old iron lying at their yard in Great Bridgewater Street, Oxford Street, City. Forms of tender may be obtained on application to the chief clerk, Paving, etc., Department, Town Hall, Manchester.

Jan. 8. MANCHESTER.—Draining, Kerbing, Flagging, and Paving with East Lancashire setts the following for the Withington Committee:—Kippax Street, Withington; Oswald Road, Chorlton-cum-Hardy; Scott Avenue, Chorlton-cum-Hardy; Titterington Avenue, Chorlton-cum-Hardy. Plans, sections, and specifications of the work can be seen and a form of tender with quantities, and any further information obtained from the surveyor to the Committee, Town Hall, West Didsbury. Tenders to be endorsed "Tender for Street Works," and to be addressed to the chairman of the Withington Committee, Town Hall, West Didsbury, not later than noon on Jan. 8.

Jan. 11. BOGNOR.—Supply of 100 tons of 1½ in. broken granite, delivered at Bognor Station, for the U.D.C. Tenders, endorsed "Tenders for Granite," must be delivered on or before Jan 11 to H. L. Staffurth, clerk, Council Offices, Bognor.

Jan. 11. LEEDS.—Taking up of the old pavers to the main roadway in the workhouse grounds, and for relaying the same as a tar macadam road, for the Guardians of the Leeds Union. Contractors desirous of tendering for this work must forward their applications to T. Winn and Sons, architects, 84, Albion Street, Leeds, on or before Jan. 11, when copy of schedule quantities will be duly forwarded.

Jan. 11. BEAUFORT.—Excavating, ballasting, and asphalting the playgrounds at the Rassau Schools, Beaufort, together with certain drainage works and boundary walls, the whole to be let in one contract, for the Ebbw Vale Education Committee. The drawings and specification may be seen at the office of H. Waters, Committee's architect, Market Chambers, Ebbw Vale. Tenders endorsed on the outside "Tender for Rassau School," should be delivered at the office of T. Hughes, secretary, Ebbw Vale, on or before Jan. 11.

Jan. 11. LEEDS.—Paving and flagging of the following streets, for the Highways Committee: Hessle Mount, back Hessle Terrace, back Hessle Avenue, Hessle Terrace, back Thornville Row, Royal Park Road, back Meadow View, Sheepscar Avenue, and Trafalgar Row. Drawings may be seen at the city engineer's office, Municipal Buildings, Leeds. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected on application at the Highways Office, 155, Kirkstall Road. Sealed tenders, endorsed "Tender for private street works," and addressed to the Highways Committee, must be delivered at the town clerk's office, Town Hall, Leeds, not later than 10 a.m. on Jan. 11.

Jan. 11. LONDON, N.W.—Supply and execution of the following for one year commencing April 1, for the St. Pancras B.C.:—(1) Removal of road-sweepings and gully soil; (4) Cartage; (5) Timber and joinery materials; (7) Paints; (8) Oils; (11) General ironmongery; (12) Tools and other hardware goods; (13) Yorkshire stone and artificial paving slabs; (14) Granite kerbs, paving setts, broken granite and Kentish rag; (15) Gravel and other roadway materials; (16) Sundry materials (lime, cement, bricks, stoneware pipes, and other glazed goods); (19) Pitch, tar, creosote oil, carbolic powder. Tenders under endorsed covers (supplied) to be delivered at the office of the Department of Works at the Town Hall, Pancras Road, N.W., not later than 12 o'clock noon, on Jan. 11. No tender will be considered unless made out on one of the printed forms, without any alteration thereof, which, with any further particulars, can be obtained on application to W. N. Blair, borough engineer and surveyor, up to the morning of Jan. 11.

Jan. 12. BOSTON.—Supply of 11,182 tons of granite and 1,286 tons slag (more or less) during 1909, for the R.D.C. Forms of tender, which must be completed and returned by the first post on Jan. 12, can be obtained from H. Snaith, clerk of the Council, 10, New Street, Boston.

Jan. 16. NEWCASTLE.—Supply and Delivery at the Newcastle Quay of 500,000 Wood Blocks. Prices for any suitable timber in blocks, either solid or prismatic, will be considered on payment of £1 1s. to the City Treasurer, Town Hall, Newcastle. Forms of tender and other particulars can be obtained at the city engineer's office, Town Hall, Newcastle. Tenders, marked "Wood Paving" on left-hand corner of envelope, and addressed to the city engineer, Town Hall, Newcastle-upon-Tyne, will be received up to noon on Jan. 16.

Jan 18. TEMESVAR.—Necessary work, Asphalt and otherwise in the general canalisation of the town. It is proposed to spend about 4.3 million kronen on the canalisation. About 3.3 millions of this sum will be devoted to the work for which tenders are asked. The plans, as well as all other details, can be seen at the town office of engineers, where also for the sum of 100 kronen all necessary papers for tenders for the work in question are to be had, printed in Hungarian. Tenders will be received up to Jan. 18, by the Magistracy of Temesvar, Temesvar, Hungary.

Jan 19. MIDHURST.—Supply of Quartzite, Granite, Tarmacadam, for the R.D.C. Form of tender to be obtained of A. G. Gibbs, surveyor to the Council, Council Offices, Midhurst, Sussex. Sealed tenders, endorsed "Road Material," to be delivered to him not later than Jan. 19.

Jan. 19. CHISLEHURST.—Supply of Broken Granite, Granite Kerb and Setts, Tar-paving and Tar, for one year from April 1. Particulars, together with forms of tender, may be obtained on application being made at the Council offices. Tenders, endorsed "Tender for ——" (as the case may be) must be delivered to H. E. Knight, clerk, not later than 4 o'clock p.m., on Jan. 19.

Jan 20. BEXLEY.—Supply of Broken Stone, to be delivered between April 1, 1909, and March 31, 1910, for the U.D.C., as follows:—(1) 1,600 tons (more or less) of Guernsey granite; (2) 840 tons (more or less) of Quenast granite; (3) 1,500 tons (more or less) of dug pit flints; (4) 150 tons (more or less) of tarred granite macadam. Specification and form of tender can be obtained upon application to W. T. Howse, surveyor to the Council. Sealed tenders, endorsed "Tender for Road Metalling," must be sent to T. G. Baynes, clerk to the Council, Council Offices, Bexley Heath (upon the prescribed form) not later than 10 a.m. on Jan. 20.

Jan. 23. SLEAFORD.—Supply of about 10,000 tons of X and XX granite, and about 10,000 tons of slag and 200 tons of gravel for paths, for the R.D.C. The material must be delivered carriage free at any railway station within the district, as set out in the form of tender. Specifications and forms of tender may be had on application to E. Clements, clerk to R.D.C., 74, Southgate, Sleaford, on enclosing a fully stamped addressed foloscap envelope. Tenders to be sent in by Jan. 23, marked "Tenders for Slag or Granite," in separate envelopes.

MISCELLANEOUS.

Jan. 8. MANCHESTER.—Supply and Delivery of the Fireclay Goods required during next season by the Gas Committee, at their several Gas Works. Full particulars and forms of tender may be obtained from C. Nickson, superintendent, at the Gas Offices, Town Hall, Manchester, on payment of a deposit of £2 2s. Sealed tenders, endorsed "Tender for Fire-clay Goods," addressed to the chairman of the Gas Committee, must be delivered at the Gas Offices, Town Hall, Manchester, on or before Jan. 8.

Jan. 11. EAST STONEHOUSE.—Supply and delivery of the following, for period ending Dec. 31, 1909:—Ordinary stock bricks; Portland cement; Lias lime; white lime; building stone; tar; stoneware pipes; granite kerbing, channelling, and setts; granite chippings; cast iron gullies, hydrant frames and covers, meter frames and covers, valve blocks and covers, stop cock blocks and covers, manhole frames and covers; blue elvan for road metalling. Forms of tender and specifications of the whole of the above materials may be obtained on application to C. H. Trounce, surveyor, Townhall, East Stonehouse, Devon. Sealed tenders, marked "Tenders for Materials," are to be delivered at his office before twelve o'clock noon on Jan. 11.

Jan. 14. HAMPSTEAD, N.W.—Works, materials, or services, for one or three years, at the option of the B.C., from April 1:—(3) York flags, (4) artificial flags, (5) granite kerb and setts, (6) broken granites and basalt, (7) road materials, (8) Thames ballast and sand, (9) lime, cement, and bricks, (10) wood-paving blocks, (11) drain pipes, (13) ironmongery, tools, etc., (14) iron castings, (21) tar paving, (22) tar macadam, (23) pitch, tar, and creosote oil. Full conditions are contained in the forms of tender, which may be had, and further particulars obtained, on application to the borough engineer at the Town Hall. No tender will be received unless on the official form. Tenders to be delivered at the office of A. P. Johnson, town clerk, Town Hall, Haverstock Hill, N.W., before 4 p.m. on Jan. 14.

Jan. 18. PLYMOUTH.—Supply of the following goods and materials for one year, from April 1, for the B.C.:—(3) Paints, (5) ironwork, (11) iron, steel, bolts and nuts, (15) Portland cement, (17) tar and pitch, (23) wood blocks, (24) creosote, (27) road metal, (29) granite kerbs, setts, etc., (30) white lead, red lead, linseed oil and turpentine. Tender must be based on the whole of a schedule (with the exception of schedule No. 29), and not on any particular item contained therein. Schedules may be obtained on payment of a deposit of £1 in cash for each schedule. Tenders to be delivered not later than 5 p.m. on Jan. 18, addressed to J. Paton, borough engineer and surveyor, Municipal Offices, Plymouth.

Jan. 20. BEXLEY.—Supply and Delivery of best Portland Cement, Manhole Covers and Frames, and Gulley Grates and Frames for the year ending March 31, 1910, for the U.D.C. Specification and form of tender may be obtained upon application to W. T. Howse, surveyor to the Council. Sealed tenders, endorsed "Tender for Stores," must be sent to T. G. Baynes, clerk to the Council, Council Offices, Bexley Heath, not later than 10 a.m. on Jan. 20.

Jan. 21. LONDON, E.—Supply of broken granite and chippings, road flints, sand for tramways, tar and pitch, ironmongery, etc., iron castings, lime, plaster, etc., Portland cement, rope and tarpaulins, etc., hardwood, lead, zinc, and solder, oils and colours, etc., stoneware pipes, etc., for the County B.C. of West Ham, E. Forms of tender and further particulars may be obtained at the Borough Engineer's Office, Town Hall, West Ham, E. (where the standard samples may also be seen), upon the payment of £1 for each form of tender. No tender will be considered unless the same is delivered at the office of the Town Clerk, Town Hall, West Ham, E., in the envelope supplied, by registered post, not later than 12 o'clock noon on Jan. 21. Fair wages clause. Securities required.

Jan. 25. LONDON, S.E.—Supply of the following stores and material for the Camberwell B.C., for the year ending March 31, 1909:—(c) White lead, colours in oil and dry, varnishes, oils, tar, pitch, creosote, etc., glass; (e) screws, nails, bolts, nuts, and washers, wrought iron, mild steel, tool and spring steel, cast-iron foundry goods, lead pipes, sheet, etc., unions, valves, etc., W.I. gas, water, and steam tube and fittings, rain-water goods, etc., etc.; (j) flints, ragstone, hoggin, hardcore, Thames and crushed ballast, broken granite, York and other pavings, tar materials, lime, cement, and miscellaneous building materials; (k) asphalte paving work; (n) stoneware drain pipes and sewer ironwork. Forms of tender may be obtained on application to W. Oxtoby, borough engineer, Town Hall, Camberwell, S.E., by specifying sections desired. Sealed samples may be inspected at Grove Vale Depot, opposite East Dulwich Station, between 10 a.m. and 12 noon, and 1 p.m. and 4 p.m.; Saturdays, 10 a.m. to 1 p.m. No tender will be considered except on the authorised form of tender, which must be delivered at the Town Hall not later than 5.30 p.m. on January 25.

Jan. 26. LONDON.—Supply and delivery of 155,000 stoneware cable-ducts, for the L.C.C. Full particulars, and also information as to the conditions to be observed by tenderers, will be found in the "London County Council Gazette" of Jan. 4 and subsequent issues. Tenders must be upon the official forms to be obtained from the clerk of the Council, County Hall, Spring Gardens, S.W., upon payment to the cashier of the Council of the sum of £2 for the specification, etc. Full particulars of the work may be obtained on application at the County Hall, before the payment of the fee for the specification, etc. No tender received after 11 a.m. on Jan. 26 will be considered.

THE
Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
30, Cross Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ARCHITECT'S Assistant (24), 4 years in present situation, 8 years' experience, town and country, will be disengaged on Feb. 1st.—G. G. S, 39, Caithness Road, West Kensington Park, W. 4774

ARCHITECT'S Assistant, nearly 23, desires re-engagement, permanent or temporary; first-class experience of town and country work, domestic, schools, libraries, business premises, competition and working drawings, perspectives, surveying and levelling; excellent references; moderate salary.—F. E. J., 10, Cobham Road, Kingston-on-Thames. 4751

ARCHITECT'S Assistant (27), 11 years' experience, good draughtsman and colourist; contract drawings, perspectives, design, quantities, details, etc.; excellent references, specimens.—Scott, Westfield House, Grove Road, Norwich. 4752

ARCHITECT'S Improver (age 21), desires post in London office; four years' articles; passed Intermed. R.I.B.A.; good references; submit specimens; salary nominal.—G. W. S., Grayshott, Marlborough Road, South Croydon. 4755

ARCHITECT'S Assistant, age 27, desires engagement, permanency preferred; good draughtsman, and capable at working drawings, details, perspectives, water-colour, and pen and ink, assistance with specifications, quantities and general work, levelling and survey; salary 30s.—Apply Aubrey Leonard Pritchard, Bryn Derwen, Rhyl, North Wales. 4709

ARCHITECT and surveyor's assistant (25), design, working drawings, details, can take off quantities, survey and level; any district.—W. M., 11, Pyenot Hall Lane, Cleckheaton, Yorks. 4739

ARCHITECT'S and Surveyor's Assistant, 15 years' good practical experience; excellent draughtsman, designer and colourist; working drawings, details, specifications, surveying, levelling and general routine; excellent references; moderate salary.—A. R., 1, Ivy Villas, Cheam, Surrey. 4698

ARCHITECT'S Junior, 5 years' experience (23) desires immediate engagement; good references; neat draughtsman, colourist, etc.; assist quantities.—Apply Box 4727, Builders' Journal Office.

ARCHITECT and surveyor's junior assistant desires situation; 4 years' experience; good draughtsman, plot from sketches; certificates, building construction; also shorthand (100) and typewriting; good testimonials; energetic; would go on trial; age 19; salary £1. — Box 4674, Builders' Journal Office.

ARCHITECT renders assistance, competition, or contract drawings, quantities, surveys, etc.; own office or out. Terms low.—50, Elm Park Road, Finchley, N. 4731

ARCHITECT'S junior assistant (20), seeks permanent engagement, town or country; shorthand.—C. Weston, The Laurels, Rotherfield, Tunbridge Wells. 4734

ARCHITECT'S assistant (23), over 7 years' London and Provincial experience; excellent references; Inter.R.I.B.A. Exam. — H. J. Wilson, "Brinkdale," Park Road, Peterborough. 4670

ARCHITECT'S Junior Assistant desires engagement in London; 6 years' experience, contract drawings, details, and measuring; moderate salary.—Box 4737, Builders' Journal Office.

ARCHITECT'S Junior Assistant (19), 4 years experience in West End Office, working drawings, details, perspectives, competitions, excellent references; salary 21s.—Box 4777, Builders' Journal Office.

ASSISTANT (23) disengaged; six years' experience town and country. Student R.I.B.A.; working and detail drawings, perspectives, levelling, shorthand and typewriting; good references; moderate salary.—S. Riches, 35, Culverden Road, Balham. 4735

ARCHITECT'S and Surveyor's Assistant, 15 years' good practical experience; excellent draughtsman, designer, and colourist; working drawings, details, specifications, surveying, levelling, and general routine; excellent references; moderate salary.—A. R., 1, Ivy Villas, Cheam, Surrey. 4698

ARCHITECT'S Junior Assistant, over 4 years' London experience, competition work, contract drawings, details, perspective; honours construction, Prelim. R.I.B.A.; very moderate salary.—Box 4661, Builders' Journal Office.

ARCHITECT'S son, 10 years' office experience, wishes to take up agency or post as representative in Lancashire, or North of England, to well-known firm in any special line of Building trade.—Apply Box 4585, Builders' Journal Office.

AS Clerk, cashier, depot manager, or any position of trust, 11 years' experience, builder's and coal merchant's trade; age 25; good penman; also reference; moderate salary.—Box 4659, Builders' Journal Office.

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

BUILDER'S general foreman, advertiser seeks engagement; 16 years' service as above with first-class London firm on important and various works; good references.—Address H., 150, Effra Road, Wimbledon, S.W. 4703

BUILDER'S or architect's assistant, 25, desires re-engagement, drawing, typewriting, shorthand, correspondence, accounts, and general office routine; also assist in quantities; excellent references, moderate salary.—Apply Box 4756, Builders' Journal Office.

BUILDER'S or surveyor's assistant (24), 11½ years' experience; quantities, estimating, plans, accounts and prices; excellent references; moderate salary with improvement. Eastern or Southern Counties preferred.—Box 4740, Builders' Journal Office.

BUILDER'S Assistant disengaged, 21 years' experience; office routine, plans, specifications, quantities, supervision, measuring up, levelling, and surveying; good references; abstainer.—L. J. Greaves, Prestwood, Great Missenden, Bucks. 4717

BUILDER'S Foreman, with good London experience of all trades, seeks position of trust; estate or business firm; correspondence invited.—H., 150, Effra Road, Wimbledon, S.W. 4716

CLERK of Works, just finishing large schools, wants situation, 15 years' experience; expert timber, good all trades; plans, surveying, levelling, etc., etc. Country estate preferred.—Caswell, New Council Schools, Biddulph, Staffs. 4720

CONTRACTOR'S outdoor manager and surveyor desires engagement; present situation 17 years; age 37; keen on variations; expert in measurements; all trades, quantities, estimating; town or country.—W., 2, Dalberg Road, Brixton. 4776

DOMESTIC Engineer, young, energetic, thoroughly practical, seeks sit as estimating or working foreman, used to taking charge; large heating and sanitary, installation; good refs.—Box 4707, Builders' Journal Office.

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.

ENGINEER, general, wants permanent appointment, official or private staff; thorough all-round experience; electrical, plumbing, smith, married, 34; good testimonials.—86, Bathurst Gardens, Willesden. 4704

FIREPROOF Engineers and Concrete Specialists. Advertiser, connected with above trades for 10 years, and whose name is well known in connection with same, desires position as manager, traveller, or head clerk; first-class book-keeper; aged 33; very moderate salary.—P. W. Potter, 73, Penshurst Road, Thornton Heath. 4719

FOREMAN Painter seeks re-engagement; smart, energetic, good references; age 31; abstainer.—S. L., 37, Richmond Road, Dalston, N.E. 4767

GENERAL Foreman seeks re-engagement, town or country; thoroughly practical in all trades; energetic, reliable and good manager of men; good references.—E. C., 15, Park Road, Merton, S.W. 4778

GENERAL foreman, disengaged, thoroughly practical and reliable; 20 years' experience; new or alterations; first-class reference.—F. C., 3, Crewdson Road, Brixton, S.W. 4668

GENERAL Foreman (or foreman of carpenters and joiners, either inside or out), seeks situation. Country or colonies preferred. Good references. Age 30. Life abstainer.—A. White, 51, Alexandra Avenue, Southall, W. 4730

IMPROVER, brass-finisher, etc., requires situation, 3 years' varied experience with well-known London firm; energetic, steady, and reliable; first-class testimonials. Abstainer. — Apply Box 4550, Builders' Journal Office.

JUNIOR Assistant desires situation, home or abroad; good practical knowledge of construction and details; competent draughtsman and colourist, working drawings, measuring and supervising, surveying and levelling; moderate salary.—Box 4613, Builders' Journal Office.

PLUMBER (26), abstainer, well up in all sanitary or lead-laying; will do piecework; town or country. Can do zinc and hot water.—W. E. B., School House, Muriel Street, Barnsbury, N. 4615

PLUMBER (Reg. by Exam.), well up in hot water and heating systems, capable of taking entire charge; 6 years' ref.; age 38.—H. P., 11, New Buildings, Hampstead, London. 4676

PLUMBING, etc., Sanitary or Lead-laying, job wanted, day or piecework; anywhere; lowest prices; best work; excellent references; used to speculating or jobbing.—Squirrell, 47a, Woodland Street, Dalston, N.E. 4749

QUANTITY Surveyor's Assistant (21), 4 years' experience, desires engagement, certificates and good references. — Apply Box 4745, Builders' Journal Office.

QUANTITY Surveyors.—A builder wishes to place his son (18) in above office; has had some experience. No premium, but can introduce business.—Apply H., Ashford House, Wimbledon Common. 4686

REINFORCED concrete foreman, disengaged, long and varied experience, especially in Kahn bars and expanded metal, timbering a speciality; carpenter by trade; good refs.—G. C., 59, University Road, Tooting, London. 4721

SLATE MERCHANTS AND BUILDERS' MERCHANTS.—Experienced traveller (with 14 years' connection Midlands), desires re-engagement; at liberty middle of December; or could arrange earlier.—Address, Slate, c/o Secretary, Builders' Exchange, Sheffield. 4624

SLATING and tiling wanted (labour only) day or piece; any quantity, large or small; distance no object.—Mack, Slater and Tiler, 3, Granville Cottages Tower Hamlets Street, Dover. 4619

SHOP or General Foreman, long West-end experience, used to alterations and repairs; understands stairs; used to good jobbing work. Address A., c/o Mr. Seymour, 14, Allsop Place, Regent's Park, N.W. 4586

TO Builders.—Situation as improver wanted by young man just out of his time; technical student; neat draughtsman; assist with quantities, supervision, etc.; abstainer. — Box 4662, Builders' Journal Office.

TO Estate Owners.—Builder (38), varied experience, desires position as agent or clerk of works, surveys, plans, quantities, setting out, accounts and supervision; country preferred.—Box 4591, Builders' Journal Office.

TRAVELLER.—Architect desires post as representative to good firm. — Address Box 4497, Builders' Journal Office.

Appointments Vacant.

BUILDER'S Clerk, experienced and relable; estimates, accounts, usual office routine; preference to Welshman; state age, salary, and references.—Apply Glamorgan, Box 4764, Builders' Journal Office.

BUILDER'S Assistant required in West Country office; knowledge of drawing, quantities, typewriting; excellent opportunity to learn business; cyclist; state full particulars and salary.—Box 4770, Builders' Journal Office.

CLERK required by architect, typewriting and shorthand; state experience and salary.—Box 4754, Builders' Journal Office.

WANTED, immediately, a first-class active all-round architect's assistant, with considerable experience in public, elementary, and secondary school planning. He must also be an expeditious draughtsman, capable of writing specifications and checking accounts. Preference given to one capable of preparing a complete bill of quantities (London system), up to at least £10,000. Salary not to exceed three guineas per week, payable monthly. Apply stating full particulars and testimonials (copies) to D. Pugh - Jones, County (School) Architect, 62, Charles Street, Cardiff. 4733

January 13, 1909 Volume 29 . No. 2

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: Concerning Competitions; The Decay of Apprenticeship - - - - - - - 21
Pap with a Hatchet; The Royal Gold Medal; Recreation and Education; "Out of Print" - - - - - - - 22
Composition of Concrete and Bricks. By H. D. Searles-Wood, F.R.I.B.A. - - - 23
Notes and News - - - - - - - - 24
Our Plate - - - - - - - - 24
Bury Secondary School Competition - - 24
Notes on Competitions - - - - - - 26, 27
Enquiries Answered - ... - - - - - - 28
List of Text Books Approved by the Board of Architectural Education - - - - 30
Correspondence - - - - - - - - - - 30
Complete List of Contracts Open, xxi.-xxiii.
Tenders - - - - - - - - - vi., viii.

CONTRACTORS' SECTION.

"Applications" under the London Building Acts. By B. Wyand - - - - - 31
Wayleaves for Telephones and Telegraph Poles and Lines - - - - - - - - - 31
The Brick and Tile Trades - - - - 32
How to Fell a Tall Chimney. By Herbert C. T. Kemp - - - - - - - - - 33
Iron Roofs. By T. McGill - - - - - 34
Law Case: A Quantity Surveyor's Claim - - 36
Matters of Opinion: The Increased Employment of Specialist Contractors - - - 36
Views and Reviews: Old Essex Buildings; Bridge Construction Problems - - - 37
Federation News - - - - - - - 37
Proposed New Works - - - - - - 37
Works in Progress - - - - - - - - 38
Trade and Craft - - - - - - - - 39
Architectural Societies - - - - 39
Bankruptcies - - - - - - - - 40
Coming Events - - - - - - - - - 40
New Companies - - - - - - - - - 40
National Federation of Building Trades Employers: Monthly Reports - - - - 41-46

ILLUSTRATIONS.

How to Fell a Tall Chimney. Seven Illustrations - - - - - - - - - 33, 34
Self-supporting Curved Iron Roofs. Details 35
Bury Secondary School Competition: First Premiated Design (T. Thomas Halliday, F.R.I.B.A., Architect), 24, 25; Second Premiated Design (Castle and Warren, Architects), 26; Third Premiated Design (Quiggin and Appleyard, Architects) - - 26
House, Willbury Road, Letchworth. Underwood and Kent, Architects - - - - 27
Details of Lead Work on Turret - - - 29
New Rating Offices of the Corporation of the City of London, Centre Plate

Concerning Competitions. The resolution, moved by Mr. Gammell at the recent meeting of the R.I.B.A., requesting the Council to give effect to the will of the members of the Institute as expressed by a former resolution (under which the system of limited competitions was deprecated), revives a time-honoured controversial question connected with the conduct of architectural competitions, viz., "Should they be thrown open to all, or should they be restricted to the few?" Frankly, although, until recently, we have been staunch supporters of the open competition system, we are now quite undecided as to which of the two methods is the more likely to advance the art of architecture. *Theoretically*, it is only right and fair that the young and untried architect, who is struggling for recognition, should be allowed an opportunity of exhibiting his powers by submitting designs, and winning prizes, for important public buildings, even although he may be incapable of carrying them out in a thoroughly satisfactory manner. But, having regard to the fact that the average assessor is often unable to understand and appreciate either the true principles of design or the geometrical characteristics of correct planning, we are beginning to doubt whether, under either system of competition, the result of his judgment is likely to lead to any great advancement in the art of architecture as it is now understood and practised in this country. Thus, in an open competition in which unscholarly designs submitted by young and inexperienced architects are bound to exceed in number those emanating from older competitors, the probability of a bad award amounts, in these days, almost to a certainty. With regard to a limited competition, the chances that a suitable design may be selected are somewhat greater, because in this case the competitive drawings adjudicated upon by the assessor are likely to be, in the main, the work of architects of greater skill and experience. In other words, as a general rule in an open competition designs of an unscholarly type of architecture will predominate, and those of a more architectural character be in a minority; whereas in a limited competition, the relative positions of the two classes of design will be reversed, and thus the assessor's award is less likely to be governed by his personal predilection for work designed in a style which, naturally, often commends itself to a badly trained and imperfectly educated man. Let us take as a concrete example the recent open competition for the Glamorgan County Hall, with reference to which a very able letter appeared in the correspondence columns of last week's issue of THE BUILDERS' JOURNAL. In this case, as our correspondent points out, "architecture had nothing to do with the award," and with this, and many other remarks contained in his letter, we are in hearty agreement. On December 23rd we published illustrations of the three designs to which the premiums were awarded. The planning of the successful competitors exhibits that want of real knowledge of the essentials of architectural design to which we drew attention in the case of the selected scheme for the London County Hall. In both cases the badly arranged fenestration and the inadequacy of the inner areas for light and air betray the novice and the imperfectly trained architectural tyro. Indeed, in the selected design for the Glamorgan County Hall, the sash windows appear to be placed without the slightest regard to the internal aspect of the rooms in which they occur, and inner walls, or partitions, occasionally "finish" against them in some mysterious manner which is not quite apparent from the drawings. As an effort in serious architectural design the elevations are altogether beneath criticism. Passing, without comment, the second premiated design, let us turn to that which received the third premium and note the far more scientific and symmetrical planning of the experienced competing architect. Although it is well known that designs of a higher order of architectural merit than those to which the premiums were awarded were submitted in this competition, yet a comparison between the premiated ones is, in itself, sufficient to illustrate our point, viz., that in competitions limited to architects of experience the designs submitted would be likely to attain a higher standard of architectural merit than those obtained through the medium of an open competition. Of course, under either system, there is the same difficulty with regard to the vagaries of the assessor, but it is unlikely that awards would be so consistently bad if the proportion of the unscholarly designs received amounted only to a small percentage of the total number submitted in the competition. It is true that the supporters of the open system of competition can point, with pardonable pride, to St. George's Hall, Liverpool, as being the result of a competition won and, practically, carried to a successful issue, by a young and untried man. But they must, however, not lose sight of the fact that Elmes, at the time he won the competition, was fresh from his classic studies in Greece and Rome, and that, in his time, the possession of architectural scholarship was not detrimental to professional success. On the contrary, the accurate knowledge of his art displayed by his competitive drawings was instrumental in affording him the opportunity of producing one of the very best examples of modern architecture.

The Decay of Apprenticeship. The question of apprenticeship is frequently mentioned and sometimes discussed, at meetings of the federated building trade employers; and we now note a reference to the subject in the monthly report, published in the Federation section of the present issue, from the National secretary. It is there remarked that most of the evils from which French master builders are at present suffering arise from the decay of the apprenticeship system. The immediate results of this decline we suppose to be bad workmanship and bad feeling. The supply of competent and trustworthy craftsmen is not being maintained. In this country the dearth is less conspicuous, and the defects are less pronounced, especially in the moral point of view. Our men have not yet brought wanton *sabotage* to the perfection of a fine art, and would certainly shrink from the excesses in that direction with which French employers credit their men; *sabotage*, as far as we can make out, being the deliberate scamping of work in such a manner as to give the utmost inconvenience to the employers against whom they harbour grievances. This manifestation of criminal ill-feeling is, it may be imagined, a modern growth, consequent on the estrangement between master and man that was impossible under the old apprenticeship system, in which the relationship of master and apprentice was in many instances almost that of father and son. The small man often worked at the same bench, and sat at the same table, as his apprentice. The mutual sympathy thus engendered there is in these days but little to foster. The apprenticeship system began to die out with the small master. Big firms did not care to be bothered with apprentices, or, having bound them, took no personal interest in them. The system became obsolescent. We are inclined to think that the attempt to revive it is not likely to be successful, the conditions in which it flourished being so greatly changed. It seems necessary, however, to devise some system of maintaining and raising the standard of efficiency, and the ways and means of effecting this object have yet to be discussed and determined. If the federated employers and the various trade unions could in conference evolve a satisfactory scheme for educating the craftsman, they would render the nation a service by showing the way to all the other industries, which at the present moment are equally deploring the decay of apprenticeship and the absence of an adequate substitute. But the whole question ought to be dealt with on a still broader basis. It is a national concern of vital importance.

Pap with a Hatchet. Mr. P. G. Konody has been "searching for signs of progress in municipal architecture." He has looked for them (perhaps with a Diogenes lantern) in London, Birmingham, Liverpool, Manchester, and Bristol, and "found little to encourage" him. "And then I went to Cardiff." Here, it seems, he found encouragement in the series of "monumental edifices—City Hall, Law Courts, University, and so forth." The citizens of Cardiff are availing themselves of "one of those rare opportunities which occur perhaps at intervals of centuries," as when Heré and Lamour beautified Nancy, or when Schmidt, Hansen, and Hasenauer created the Ringstrasse at Vienna, and the good beginning with the new city hall and the law courts, whose architect was "inspired no doubt by the glories of Nancy," "should make Cardiff the architectural show-place of England." That satirical correspondent who, in criticising in our columns last week the designs for the Glamorgan County Hall, referred to "the style of Queen Anne or of Mary Anne," should rejoice to add to his list "the glories of Nancy," as reflected in far Cathays Park. Mr. Konody, feeling that "architectural jingoes and revilers of the Ritz Hotel" will object to the essentially French character of the two buildings at Cardiff, reminds them that, "save in domestic and ecclesiastic architecture, there has never been a national English style, and that it is no worse to turn to French than to Greek or Italian examples. The greatest English architects based their styles upon foreign architecture—Inigo Jones upon Palladio, and Wren upon French modifications of the Italian Renaissance; while Cockerell explored classic soil for his inspiration. Indeed, the best public buildings in England have always been intelligent adaptations of 'foreign' styles, originality being shown merely in details and in novel combinations of old motives." The "architectural jingoes and revilers," on being offered this milk for babes, may well recall the striking title of an old polemical pamphlet—"Pap with a Hatchet." But at length his secret is out. He is apparently incapable of admiring any building that does not show French influence. This want of catholicity of taste is a measure of his value as a critic of architecture, making quite obvious the reason why, in his peregrinations, he finds so little to praise and so much to blame. If, as Froude learnt history by writing it, Mr. Konody, in the fulness of time, acquires greater breadth of view and more judicial discrimination in architectural values, he will probably be sorry to have slighted or disparaged much meritorious work to which his present bias seems to make him blind. He will then find more "to encourage" him; and he will be in a position to discard both his hatchet and his pap.

The Royal Gold Medal. The selection of a suitable recipient for the Royal Gold Medal, annually conferred by the Royal Institute of British Architects upon some distinguished architect—man of science or letters—is becoming one of great and ever-increasing difficulty. Last year the medal was awarded to the well-known French architect, Monsieur Honoré Daumet, and, in the natural course of events, in this year of grace 1909, the distinction should, presumably, fall upon an Englishman. But what architect, or architectural writer of the day, eligible, in other respects, for the honour, is either capable of designing buildings of pre-eminent architectural merit, or of producing literary effusions, of transcendental value, "tending to promote or facilitate the knowledge of architecture or the various branches of science connected therewith"? In the early days of the Institute—prior to the general disappearance from the ranks of the architectural profession of men of culture, scholars and gentlemen—there was little or no difficulty in selecting a man judged worthy, by universal consent, to receive this, the highest honour it is in the power of the R.I.B.A. to bestow. On referring to the now somewhat lengthy list of the past recipients of the Royal Gold Medal, it appears that the first architect thus distinguished (as far back as 1848) bore the honoured name of Charles Robert Cockerell, and the infallible test of time has amply justified the wise choice, made by the then governing body of the premier architectural society, in favour of this highly cultured and gifted man. Again, when two years later the distinction fell to Sir Charles Barry, the selection was an almost equally happy one, and amongst other worthy recipients of the Royal Gold Medal we may mention James Fergusson (1871), George Edmund Street (1874), and Charles Garnier (1886), each of whom was conspicuous, in his day, for eminent services rendered to the art of architecture. But, on the other hand, it is disappointing to notice that, in some instances, the wisest and best possible selection was certainly *not* made. Indeed, when the architectural output (of one after another) of the men selected on various occasions for this special distinction is recalled, charity compels us to conceal our indignant feelings by saying, with Moliere, "que diable allait-il faire dans cette galère?" We repeat what, in effect, we have said many times before, *viz.*, that no architect is worthy to become the recipient of the Gold Medal of the Institute unless his buildings possess that lasting quality of design which Sir Christopher Wren described as "the attribute of the eternal," and, in view of the unscholarly productions of the majority of the architects of to-day, we sympathise with the members of the Council of the Royal Institute of British Architects upon the manifold difficulties of the task upon which they will shortly be engaged. If it be true, as Wren insisted, that architecture aims at "eternity," and should be "incapable of new fashions," then, as he also remarks, an architect should not only have regard to the judgment likely to be passed on his work by contemporary opinion, but also endeavour to anticipate and provide against the criticism of those who live centuries after him; and if this be true of the architect, there can be no question that the fact should be borne in mind by those called upon to assess the artistic value of current architectural work, and it thus becomes the bounden duty of the Council of the R.I.B.A. to adopt a wise and far-seeing policy with regard to its choice of recipients of the Royal Gold Medal.

Recreation and Education. Some very weighty reasons for not allowing a surveyor to take three or four pupils on to a recreation ground to give them lessons were adduced by the chairman of the Bromley Town Council Recreation Grounds Committee. The surveyor had asked for permission to do this on Mondays, Tuesdays, Thursdays, and Fridays. An alderman, boldly discarding the traditions of his dignity and insignia, asked why this innocent request was refused. "It was a public ground," he said, "and it appeared to him that if he or anyone else desired to go there with a sextant, a chain, or a theodolite, there was no objection to it. He did not see why it could not be done without asking permission." The disgusted surveyor must now regret his fatal exhibition of politeness. These arguments were remorselessly hurled at him from the chair: "In the first place, the ground was for the purposes of recreation, and not for education. In the second place, the surveyor was not a ratepayer, neither were the pupils whom he proposed to bring down ratepayers." These noble sentiments and irrefragable arguments were irresistible. Not another word was said. Opposition was pulverised. Recreation grounds are not to be turned to the base uses of education—except by ratepayers.

"Out of Print." It is even as we said. Our Special Issue at once ran out of print. Anticipating a large demand, we printed an issue greatly in excess of that which had been found inadequate with the preceding Special. But, as we stated some weeks before publication, we were sure that, nevertheless, the supply would be at once exhausted. The question naturally arises, "Why, then, did we not provide for a larger supply?" The explanation is simple. That which is foreseen is not always remediable. By the time we knew for certain that the number ordered would be insufficient to meet the demand, the earlier sheets of the issue had been printed off, and the order could not be increased. We are sincerely sorry that so many readers have been disappointed in their efforts to secure copies; and the applications which could not be supplied have been so numerous as to extort an apology from our publisher. While joining in his expression of regret, we cannot conceal our satisfaction at this most gratifying appreciation of our labour and enterprise. While we are upon the subject of the JOURNAL, we may be pardoned for drawing attention to the change that has been made in the wrapper. The lettering has been re-drawn in a style that is more purely artistic, and in order to give it full effect, we have removed the advertisements that formerly filled up the front page of the cover.

COMPOSITION OF CONCRETE AND BRICKS.*

By H. D. Searles-Wood, F.R.I.B.A.

Concrete Aggregates.

Some interesting results as to the relative strength of concrete made with aggregates of broken brick and gravel respectively, and also with broken brick and gravel mixed in varying proportions, have been obtained from experiments instituted by H.M. War Department in connection with the construction of a large building, for which it was calculated that a maximum weight of two tons per foot super. would be brought upon the concrete foundations.

The experiments were carried out by means of cubes of concrete 1ft. by 1ft. by 1ft., mixed and put together under precisely the same conditions as occur in actual practice. The aggregate of broken brick or gravel was broken to ½-in. gauge, and mixed with a sufficient proportion of sand to fill the interstices. Briquettes of the Portland cement used for making the concrete were previously tested, and successfully withstood a tensile strain of 400lb. per square inch of section after seven days' immersion in water. Four blocks of each of the following varieties of concrete were then made, viz.:—

A. Concrete composed of six parts cleaned broken bricks, one part sand and one part Portland cement.

B. Concrete composed of six parts uncleaned broken bricks, one part sand and one part Portland cement.

C. Concrete composed of six parts broken stone, one part sand, and one part Portland cement.

D. Concrete composed of three parts of cleaned broken brick, three parts broken stone, one part sand, and one part Portland cement.

E. Concrete composed of four parts cleaned broken brick, two parts broken stone, one part sand, and one part Portland cement.

The bricks used for the aggregate were very old, rather soft, and easily broken, having pieces of the old mortar adhering to their surfaces; in the remaining intances the old materials were roughly cleaned from mortar before breaking to the required gauge.

The concrete blocks were forwarded to Messrs. Kirkaldy and Sons, and their actual resistance to compression ascertained after being allowed to set in air for thirty-one days. Each block was bedded between pieces of yellow pine, ¼-in. thick, before being tested.

Sand and Gravel.

The terms sand and gravel are a trifle indefinite, so for the sake of distinction all mixtures that will pass a sieve with a ¼-in. mesh is sand, and all that will not pass is gravel. Good authorities state that loose gravel of ¾-in. diameter and under contains about 33⅓ per cent. of voids, which is reduced to 21 per cent. by ramming. From this it can be seen that one part of sand will fill the voids in three parts of gravel, that is a mixture of 1 to 3. The percentage of voids increases somewhat with an increase in the size of the gravel, which would correspondingly decrease the above ratio. The gravel should be of different sizes, varying from coarse to fine screened, or washed entirely free from clay, loam, or other foreign matter, and be free from scale, slime, or humus. Gravel sufficiently clean can often be obtained from river beds or gravel pits, but rarely from gravel banks.

Gravel can be readily cleaned by sluicing. Sufficient water should be used to carry away all objectionable matter, including fine sand. As a rule, more cement is required in gravel concrete than in the same volume where broken stone is used; 10 per cent. is about the amount of extra cement that should be used in gravel concrete over and above that required with broken stone.

Ballast for Building Sites.

If the building is on a clay subsoil an excellent substitute for the layer of cement concrete over the site of a domestic building can be made by burning the clay and mixing the burnt ballast with gas tar whilst it is hot. The mixture can be left for some time till the brick footings are laid, and then it is spread over the site and well rammed, and it will be found to be more impervious than the cement concrete.

With the introduction of reinforced concrete building much greater attention has been paid to the methods of testing Portland cement and selecting the materials for the aggregate.

The lecturer here quoted the recommendations contained in a report of the Materials Sub-Committee of the Reinforced Concrete Committee of the Royal Institute of British Architects.

Composition of Bricks.

Bricks are made of burnt or baked argillaceous or clayey earth, and the quality of the bricks depends upon (a) the chemical properties of the earth; (b) the preparation of the earth; and (c) the different degrees of burning or baking. The following is approximately the chemical composition of a good brick earth—silica 3-5ths, alumina 1-5th, live lime, magnesia, manganese, soda, and potash, 1-5th. Clay or silicate of alumina forms the bulk of brick earths. It possesses the property of plasticity when damp, but upon the application of sufficient heat it gives off its water, losing its plasticity, and becoming permanently rigid; by no known process can its plasticity be restored. It contracts and warps during burning. Silica is present either chemically combined with alumina and water, or free in the form of flint and sand. Its presence in clays produces hardness, resistance to heat, durability, and it prevents shrinkage and warping. According to Dr. Rideal, refractory fire-clays are of two classes: (1) The silicate of alumina class, in which the alumina is about half the silica and the silica mostly in combined form; (2) the silicious class in which silica predominates up to about 90 per cent., mostly in the free state, and the alumina is low. Lime, when present in brick earths, acts chemically on burning as a flux, causing the particles of the bricks to unite, producing greater molecular strength, and in small quantities diminishing contraction. An excess of lime causes the bricks in burning to melt and lose their shape.

Magnesia and iron influence the colour of bricks. Clays often contain various salts and those containing a quantity of common salt when it is in excess it acts as a flux, causing the bricks to warp and twist, in addition to which such bricks absorb atmospheric moisture for a considerable time.

Very few brick earths are found in such a condition as to allow of their being used without some special preparation. They are practically classed as plastic or strong clays, loamy clays, and marly clays.

Plastic clays contain silica and alumina, but very little lime, magnesia, soda or other salts, and are known as pure clays. For the manufacture of bricks these clays require the addition of silica and lime.

Loamy or mild clays contain quantities of free silica, and are known as sandy clays, To these lime is frequently added. Marls or calcareous clays contain a large proportion of lime, make good bricks, and are frequently used without the addition of other substances.

The treatment of brick earths may be performed by hand or machine, and is:—1st, the preparation of the brick earth; 2nd, the moulding; 3rd, the drying; 4th, the burning.

The chief methods of brick-making are (1) hand-moulded clamp-burnt bricks, commonly called slacks; (2) the machine-made wire-cut kiln-burnt; (3) machine-made pressed or hand-moulded kiln-burnt bricks. The ordinary process of brick making is so well known I will not describe it, but Messrs. Eastwood and Co. have recently set up a process for making what are known as slop bricks by machinery, which may be of interest.

Slop Bricks.

The brick earth, which is a thin superficial layer of natural clay, is dug and mixed with water until the mixture is of the consistency of cream; it is then run down iron pipes a distance of more than a mile, and is run into set-backs or shallow tanks formed in the ground, where it is mixed with the ashes or fuel with which it is burnt. After remaining there until the moisture is the consistency of dough, it is conveyed to a machine, in which it is forced into a mould the shape of a brick, only larger, to allow for shrinkage. (The clay generally shrinks about 1-10th in all directions.) From this machine the brick is placed in an iron trolley and run into a kiln, which is 180ft. long, and by means of machinery the trolley passes slowly through the kiln, in twenty-four hours coming out at the other end of the kiln dried and cool enough to handle. It is placed on a second iron trolley and enters another kiln, 180ft. long, in which the brick is raised to a red heat, and slowly allowed to cool as it passes in twenty-four hours to the other end of the kiln, when it is again cool enough to handle, and is taken and stacked ready to be carried away. This process does in forty-eight hours what takes by air-drying under hulks and burning in clumps four months, and the percentage of waste in the first case is not more than 3 per cent., and in the clump-burnt brick 25 per cent. to 30 per cent.

Machine-made Fletton Bricks.

The operation consists in clay-getting, drying, grinding, softing, pressing, and burning. The clay, which is obtained from the Oxford clay formation and is a dense bluish-grey

DIAGRAM I.—STRENGTH OF PORTLAND CEMENT CONCRETE BLOCKS TO RESIST COMPRESSION AFTER BEING ALLOWED TO SET IN AIR FOR THIRTY-ONE DAYS.

No.	Description of Concrete.	Weight lbs. per cube ft.	Slightly Crushed. Tons per sq. ft.		Crushed. Tons per sq. ft.	
*A*¹	6 parts cleaned broken brick, 1 part sand, 1 part cement	123	22·6	17·1	24·4	20·0
*A*²	Do.	115	17·9		20·1	
*A*³	Do.	124	12·0		18·1	
*A*⁴	Do.	119	15·9		17·3	
*B*¹	6 parts uncleaned broken brick, 1 part sand, 1 part cement........	124	20·3	16·8	21·3	18·6
*B*²	Do.	120	17·2		18·3	
*B*³	Do.	119	15·0		18·1	
*B*⁴	Do.	118	14·7		16·7	
*C*¹	6 parts broken stone, 1 part sand, 1 part cement	137	15·6	12·3	17·1	14·1
*C*²	Do.	138	13·4		15·0	
*C*³	Do.	141	13·4		14·4	
*C*⁴	Do.	139	6·7		10·0	
*D*¹	3 parts cleaned broken brick, 3 parts broken stone, 1 part sand, 1 part cement......	128	18·1	15·4	19·4	16·6
*D*²	Do.	126	15·4		16·4	
*D*³	Do.	125	15.4		16·3	
*D*⁴	Do.	126	12·9		14·1	
*E*¹	4 parts cleaned broken brick, 2 parts broken stone, 1 part sand, 1 part cement	124	14·3	12·4	16·3	15·2
*E*²	Do.	124	12·6		16·0	
*E*³	Do.	126	13·7		15·4	
*E*⁴	Do.	126	9·1		13·3	

[*Part of a Paper on "Materials," read before the Architectural Association, on January 8th, by Mr. H. D. Searles-Wood, F.R.I.B.A.]

shale, is dug, dried on a drying-floor to expel superfluous moisture, and ground in a mill similar to a mortar mill, the receiver revolving and carrying the clay under the rollers. The bottom of the receiver is perforated, which allows the material when sufficiently ground to fall through as a coarse powder into a pit beneath. It is then elevated and shot into a revolving circular sieve, the material that is sufficiently fine passes through, the remainder is conveyed back to the grinding mill. The sifted powder falls into a hopper, from whence it is passed to the pressing machine, where bv an ingenious arrangement it is measured off and passed under the die, when it is pressed into the form of a brick and removed automatically from the mould. The bricks are then placed on barrows and slaked in the kiln, which is of the Hoffmann type, and then burnt. The time from digging the clay to the slaking in the kiln need not occupy more than fifteen minutes; the time taken to burn the bricks usually occupies about three weeks. Bricks made by this process are being sold in the brickfields, the lecturer said, at 9s. per 1,000. The danger of the process is that the Oxford clays contain many fossils such as ammonites, belemnites, etc., and the men who dig the clay are paid 1s. 6d. per bushel to pick out the fossils.

Varieties of Bricks.

Sand-faced bricks are of a beautiful red colour and texture, often made by hand and pressed by machinery, they are kiln-burnt, and in selecting them great care has to be taken to see that they are sufficiently burnt; the rough test is to sound them, the well-burnt ones have a ring, while the slack-burnt ones sound dull.

Rubbers are similar bricks, only always hand-made, and of a uniform colour and texture throughout; they can be moulded by cutting with a steel-twisted wire saw and filing; also they can be carved. They are made red and white, but the red ones are the most satisfactory.

Pressed bricks as a rule are made from stiff plaster clay, if white from gault; the red colour is due to oxide of iron, the white to lime, usually in the form of chalk. A new form of white brick is now being made by mixing lime and white sand and pressing the mixture in a mould; they are known as Acme bricks.

Glazed bricks are usually made from stoneware clays, and are either saft-glazed, that is, salt is thrown into the kiln to produce the glaze, or are dipped in a slip of specially-prepared clay then half-burnt, which produces a smooth china face.

(*To be concluded.*)

Notes and News.

The School of Art Wood-Carving, we are officially informed, has removed to new premises at 39, Thurloe Place, South Kensington, off Exhibition Road, three minutes from South Kensington Station.

* * *

It has been decided to perpetuate the memory of the late Sir George Livesey, and the Committee having the matter in hand desire to announce that contributions to the Fund should be sent to the Secretary of the Institution of Gas Engineers, 39, Victoria Street, Westminster. A sum of at least £10,000 is required for the object in view, the endowment of a Livesey Professorship in Gas Engineering and Fuel at the Leeds University—and contributions, both small and large, will be welcomed. Having regard to the great services which Sir George Livesey rendered the industrial world, and indeed to all classes of the community, it is felt that there will be a general desire throughout the country to do honour to his memory.

* * *

The finest extant portion of the town walls of Newcastle-upon-Tyne has been transferred from private ownership to the possession of the Corporation. The purchase includes Morden Tower, a vaulted bastion having a modern superstructure, and Arber or Herber tower, occupying a salient angle of the town wall and still retaining its vaulting, loops, parapets, and other original features. The walls between these towers remain, with but few breaks, for a length of 400 yards. The walls and towers of which these form a part are the work of Edward I., under whom the circumvallation was carried out in 1280.

* * *

Mr. F. Bligh Bond, of Bristol, described in a recent lecture to the Somersetshire Archæological Society at Taunton his discoveries during the excavation of the foundations of St. Edgar's Chapel at Glastonbury Abbey, a work to be resumed next spring. He believed it would be found that the total length of the Abbey Church was 59ft., which would make it the longest church ever built in England, and probably in Christendom. Mr. E. F. Somerville, one of the trustees of the Abbey, expressed the hope that people would not believe the story that the rebuilding of the Abbey was contemplated. Such a work would cost half a million.

* * *

The proposed union of the London Institution with the Society of Arts will, if the proposals now under consideration take effect, involve the abandonment of the present buildings in which the two bodies are respectively housed, and the erection of new premses in a more convenient position, Kingsway being suggested, and £100,000 being named as the probable cost.

* * *

Bournemouth Town Council has decided to erect a Kursaal, at an estimated cost of £45,000, on Belle Vue site, near the Pier approach, recently acquired by the corporation. The Mayor stated that the scheme, with the completion of the Undercliff Drive and provision of municipal buildings, could be carried out at a total capital outlay of £165,000. He showed that by increasing the rateable value and by increased revenue they would be able to meet the annual charge of interest and sinking fund of £5,600 without any interest in the rates.

* * *

The Lambeth Borough Council are applying to the London County Council for a final loan of £7,000 for the balance of expenditure upon the Town Hall buildings, fittings, etc. Loans amounting to £39,484 have already been sanctioned, and the sum of £5,535 arising out of a sale of land has been transferred as a contribution towards the cost, making a total of £44,019. The total expenditure upon the buildings, fittings, furniture, etc., is about £52,000.

Our Plate.

We give this week a perspective drawing of the New Rating Offices of the Corporation of the City of London, which are being erected from the designs of the City Surveyor, Mr. Sydney Perks. Unfortunately, plans and particulars are not available. The base of the building appears to be of polished granite; the upper stones of Portland stone, and the roof is covered with green slates.

BURY SECONDARY SCHOOL COMPETITION.

We published the award in this competition in last week's issue, and now illustrate the premiated plans.

At the beginning of last spring the Bury Education Committee advertised for architects to send in applications, if they were willing to compete in the school competition. The majority of the competitors who were invited doubtless thought that only twenty or thereabouts were accepted by the committee. It was known, however, that 200 architects were invited out of 300 applications. Though invited in name, the competition was practically an open one.

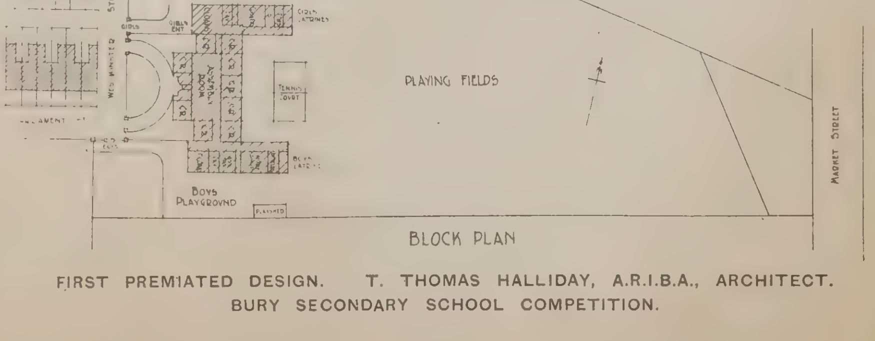
An examination of the three large rooms, packed with plans, gave one the impression that no weeding-out process had been adopted in selecting the architects. We have not seen for years such a poor collection of plans, taking them as a whole. Over 130 of the competitors did not know the most elementary rules of secondary school planning. In commenting on the exhibition the assessor says:—"It is to be regretted that many competitors have not given sufficient attention to the very clear conditions and instructions furnished and to the regulations of the Board of Education, which were also furnished. The somewhat peculiar nature of the site, the difficulty of obtaining fall for the drainage system, and the important questions of aspect and cost have compelled me in several cases to set aside designs which are in many respects meritorious." It was quite evident by the pre-historic type of draughtsmanship adopted that many elderly architects had been carefully spending months over their drawings, or had unearthed some old assistant with the help of the office lads to blacken in the windows. That is the most charitable interpretation we would like to put on this poor collection of plans. Their authors will be well advised to leave this class of professional work severely alone, as the only result is a waste of energy, time, and good Whatman paper, followed by disappointment and complaining letters to the building papers.

The award given by the assessor, Mr. J. W. Simpson, Vice-President and Fellow of the Royal Institute of British Architects, is a fair one, particularly as regards the first and second premiated designs. How the third placed came to receive an award is both a puzzle and a surprise, as there were still a few decent designs left that were better planned with some architectural character, and drawn by competent draughtsmen.

Generally.

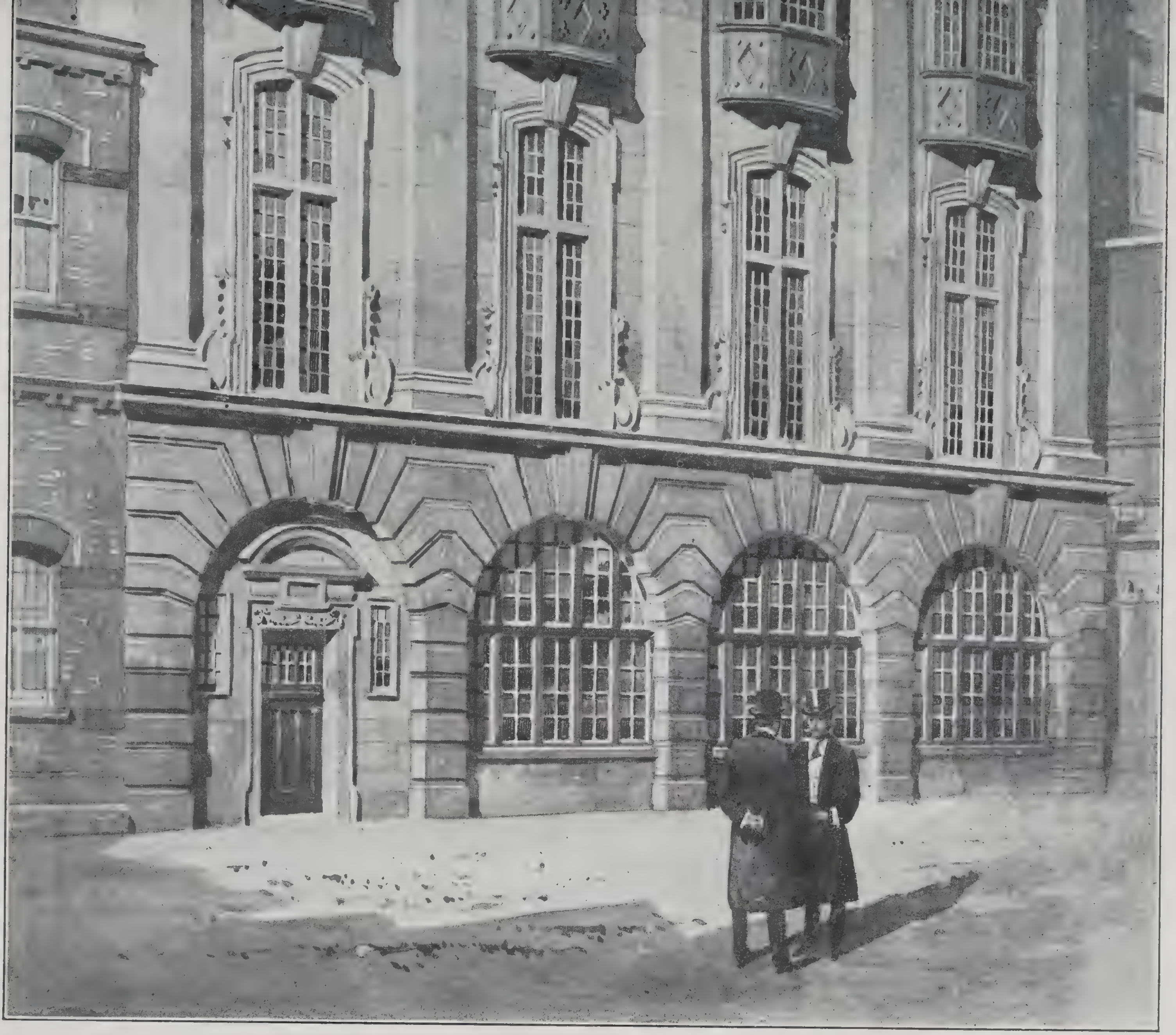
The conditions of the competition were reasonable, although the paying of the architect an inclusive fee is a bad precedent, and is likely to be followed by other public bodies.

School accommodation for 350 boys and girls had to be provided. A well-proportioned assembly hall (to seat the above number of scholars, exclusive of platform), and thirteen classrooms, with laboratories, lecture room, art workshop, and cookery rooms,



FIRST PREMIATED DESIGN. T. THOMAS HALLIDAY, A.R.I.B.A., ARCHITECT.
BURY SECONDARY SCHOOL COMPETITION.

[illegible]



NEW RATING OFFICES AT THE GUILDHALL, LONDON. SYDNEY PERKS, ARCHITECT.

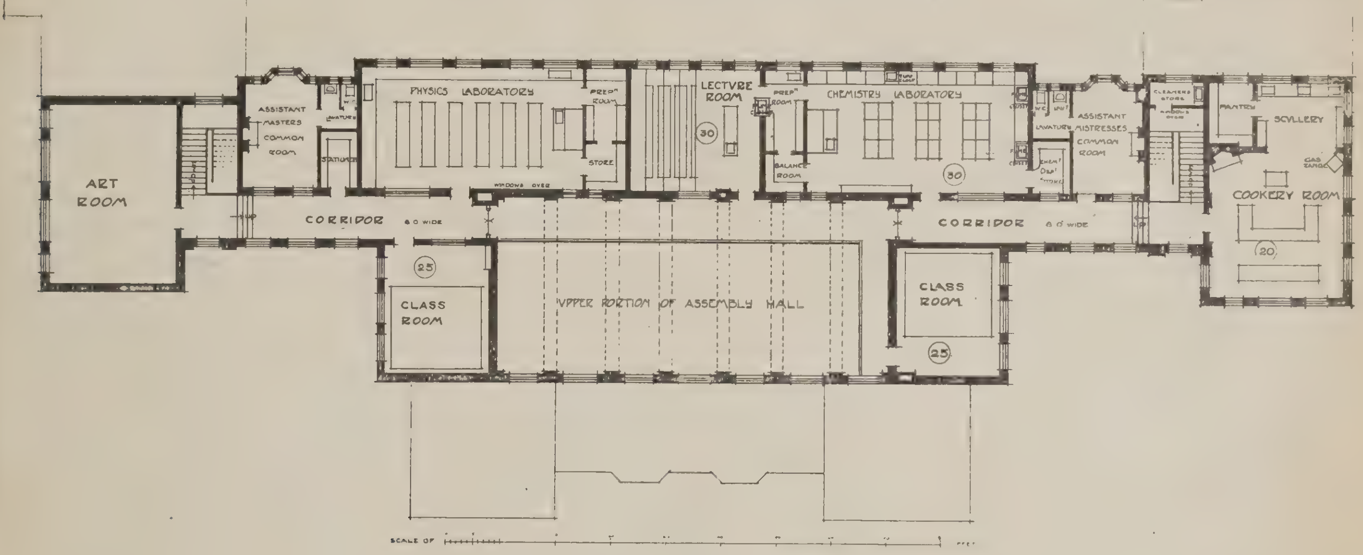
ormed the principal requirements. The cost was stated to be an important element n determining the competition, and £12,500 as the sum mentioned. The committee deemed it advisable to add a paragraph cauning competitors to be careful about the e of architecture, not to be too extravagant or ornamental, but to secure a simple inexpensive building. The remaining difficulties included a peculiar shaped site, also some trouble in planning the drainage system so as to secure the necessary falls, and the important question of aspect.

Design Placed First.

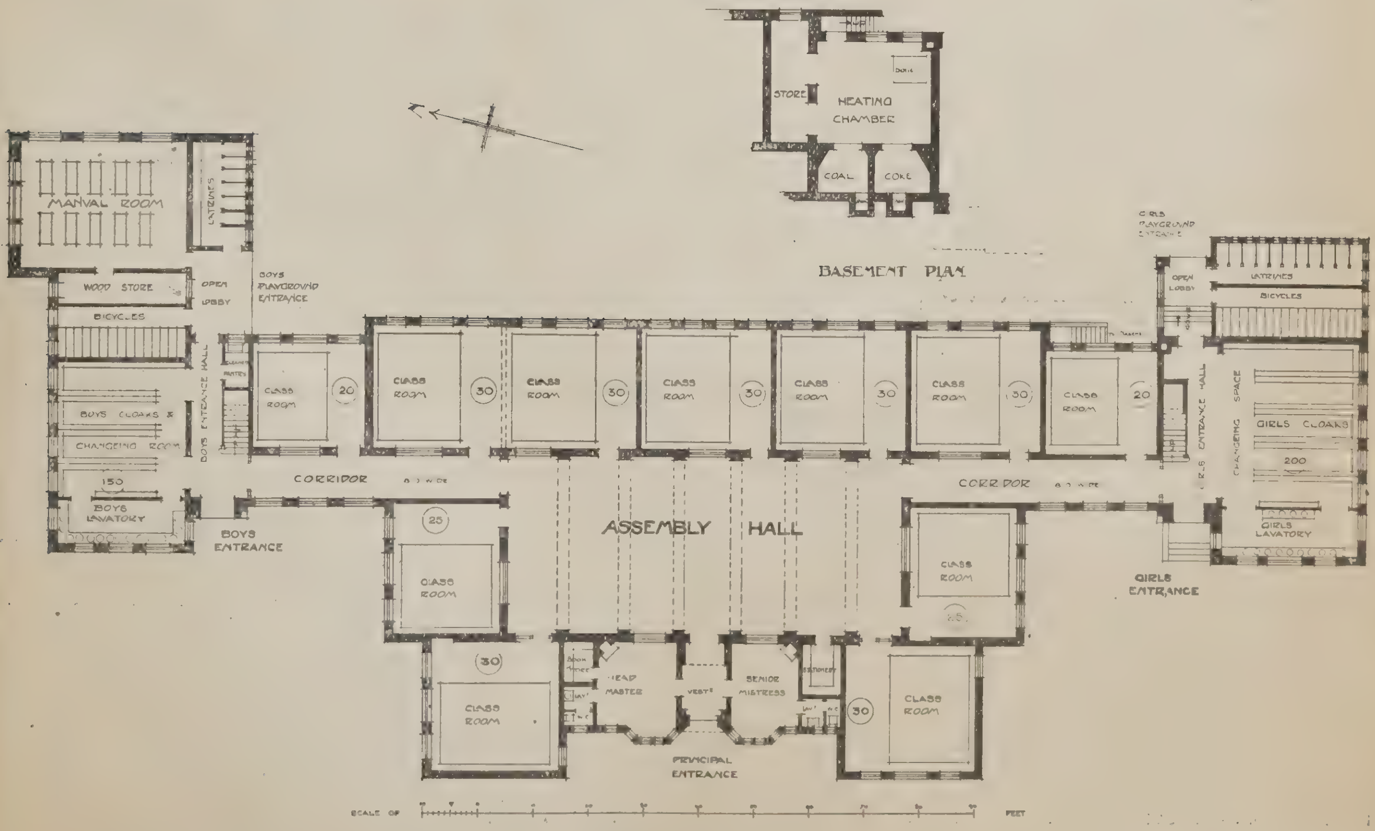
A premium of £50 has been won by the plans of Mr. T. Thos. Halliday, A.R.I.B.A., of Stockport. The scheme is not so compact as some secondary schools recently built, and the tendency throughout this plan—which is also noticeable in many of the designs—is the spreading out of the rooms so as to fill the west end of the site from north to south. This plan has no serious objections, and while not brilliantly clever or strikingly original, yet it fulfils the conditions in a practical manner, and ought to make a good working arrangement, being easily supervised. Both the assembly hall and classrooms are well planned. Eleven out of the thirteen classrooms are on the ground floor. Seven are entered directly from the hall, and the remainder from the corridors. All have left light, with a suitable aspect, though a few of the rooms face due north.

There are a few details throughout the plans which require rectifying, particularly the glazed screens between head-teachers' rooms and the assembly hall. A door is preferable beside the private or public entrance from vestibule. Book and stationery store adjoining have no direct light—the former should have a glazed screen adjoining hall side. The projecting wings on either side of main school do not balance well. More care when setting out the plans would have improved these blocks on both floors. On one of the wings there is a huge wood store which could easily be divided, and a game store made to form part of the extra space, with a door adjoining boys' playground entrance. While the lighting of the main rooms is ideal, many of the small store rooms have been overloaded and are unserviceable as shown.

The first floor plan is rather long drawn out in the arrangement of the rooms. It is doubtful if the cookery room is sufficiently isolated or cut off from the classrooms. The continuation of the assembly hall gallery round one end of the hall spoils the balance, and it is not worth sacrificing the appearance of the plan for what is gained. Evidently left light or disconnection from corridor adjoining cookery room has been the motive for the arrangement shown. The laboratory works out well, though there are too many doors between gallery and laboratories for a speedy assembly and dismissal

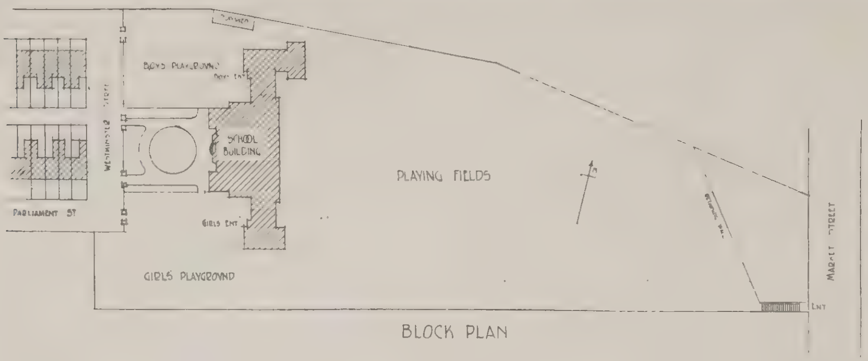


FIRST FLOOR PLAN



- GROUND FLOOR PLAN -

BURY SECONDARY SCHOOL COMPETITION: FIRST PREMIATED DESIGN. T. THOMAS HALLIDAY, A.R.I.B.A., ARCHITECT.



BURY SECONDARY SCHOOL COMPETITION. SECOND PREMIATED DESIGN. CASTLE & WARREN, ARCHITECTS.

of the scholars in using the lecturing room. In designing the elevations the architect has emphasised the entrance front by a high clock-tower, which is placed in such a position that it can be seen down Parliament Street from the main thoroughfare. Quite a considerable feature, if the cost will permit of it, and if properly placed. In this case it is shown over girls' entrance, and gives the elevations a lop-sided appearance, and takes away all balance and harmony in the composition. We don't care for the semi-domestic treatment of the elevations; they are far too fussy, and want half the ornamental played-out detail omitted; they may then look simple and dignified, and like a school instead of a Welsh mission hall. A clearly drawn view in Indian ink has helped to save this set in the eyes of the assessor. Many designs have been pulled together and improved upon by the perspective artist, and this scheme was no exception to the rule.

The boys' playshed is too near the school, as shown on block plan, and the lay-out of the ground could be improved upon; also the position of the building on the land. It is proposed to deal with the large amount of earth at the east of the site by cutting off all the loose portion of the soil at the bottom of the slope and building a retaining wall, four feet high, across the site. The slope above could then be planted with shrubbery The total contents of the building are 437,719 cub. ft.

Design Placed Second.

This position, with £25 premium, has been awarded to the scheme submitted by Messrs. Castle and Warren, of London. We recollect seeing the work of these young architects before in open competition. This set is one of the best they have prepared, and is, from an architectural and draughtsmanship point of view, the best on exhibition. It is the planning that is the chief fault of their scheme, especially in the arrangement of the projecting wings, through length of corridor and interference with south light to most of the classrooms. Assessors are still apt to treat secondary on the lines of elementary schools in the matter of sunlight, although for older scholars the rays of the sun will militate against serious study. Until this orthodox rule is amended the majority of competitors will have to abide by the old principle.

The block plan is well arranged and the building set back further than most of the schemes. It is admirably balanced considering the awkward shape of the site. The entrances for scholars do not work in happily and appear cramped and too near the public approaches. Both the long corridors in the side wings would be too draughty—the doors at the entrances would create more likely a hurricane instead of a gentle blow through. Snow and rain would also be carried well into these corridors. The grouping of the classrooms round the hall is done in a wasteful manner, making too many projections throughout the plan. A parallelogram or slightly squarer plan with shallow breaks—as few as possible, and only then for architectural effect—is the best type of block plan for most schools.

The first floor is more compact than the ground plan, but narrow corridors and errors in the arrangement of some of the rooms detract from its appearance.

In the exterior treatment this design is a long way the best architecturally; all the elevations are interesting, though inexpensive. The set is smartly drawn and original in parts, and a most creditable scheme in every way. A softly coloured view—a trifle small in size—completed this charming set of drawings.

Design Placed Third.

The plans submitted by Messrs. Appleyard and Quiggin, of Liverpool, received the third premium of £10. In all fairness, we don't think that this scheme is entitled to this position, as a few superior sets have evidently been overlooked by the assessor. This is not as satisfactory a design as this firm has turned out in the past. Although famed for their planning, it is in this case most disappointing. The arrangement is stereotyped and indicates the authors who have worked the same plan successfully at Wallasey, Cheshire. In detail this plan, of course, differs, and it is not comparable to that school.

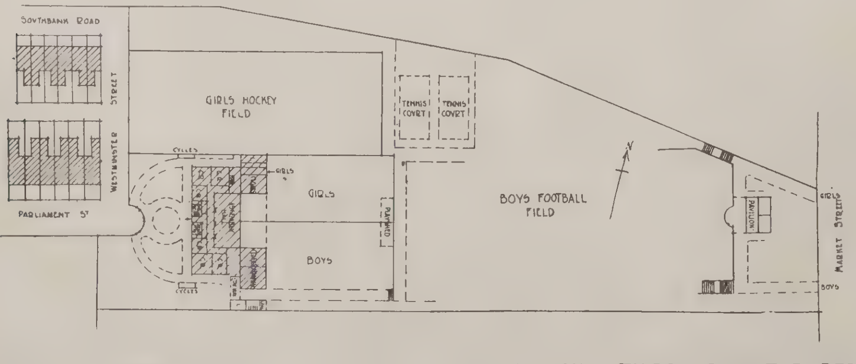
An objectionable feature is the position of the cloakrooms, lavatories, and latrines. They look congested and not too well lighted and ventilated. The boys' cloakroom is quite separate from the lavatory—the latter being situated 40ft. further at the end of the covered way.

On the first floor, the assistant teachers' rooms are too far from the main stairs to be easy for access and supervision. Over the assembly hall above this floor are the chemical and physical laboratories, lecture rooms, etc., centrally placed, but most of the rooms are too deep and square for window lighting without supplementary top-light.

The elevations are commonplace and dull, and void of any pretensions to architectural design. They were poorly drawn, and the perspective that accompanied the set was badly set up and looked as if it had been inked in by an apprentice. The cube contents amounted to 394,310 cub. ft.

Other Designs.

We are surprised to find that many of the leading school architects were not represented in this competition. Some must have applied for the privilege of competing, but well-known favourites that you see in all open competitions were not represented. Their place was filled as a rule by sets that were no credit to the profession. The following schemes were well arranged and worth mentioning:—Nos. 40, 71, 77, 44, 9, 48.



BURY SECONDARY SCHOOL COMPETITION. BLOCK PLAN: THIRD PREMIATED DESIGN. APPLEYARD & QUIGGIN, ARCHITECTS.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Jan. 31	*SOUTH BANK - IN - NORMANBY. Town Hall, Council Offices, etc., for the Urban District Council. Particulars of the Clerk, Town Hall South Bank, S.O., Yorks.
Mar. 17	NEW OFFICES FOR THE STANLEY U.D.C., DURHAM. Cost £3,500. Premiums £30, £20 and £10. Conditions, etc., to be obtained from J. G. Ridley, Clerk to the Council. Stanley S,O., Co. Durham.
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days.

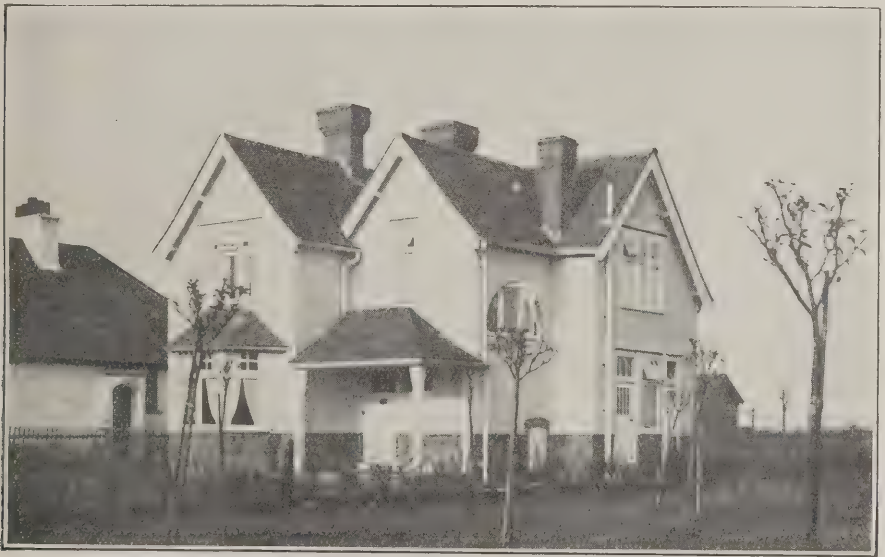
**The R.I.B.A. Council has requested Members to refrain from competing.*

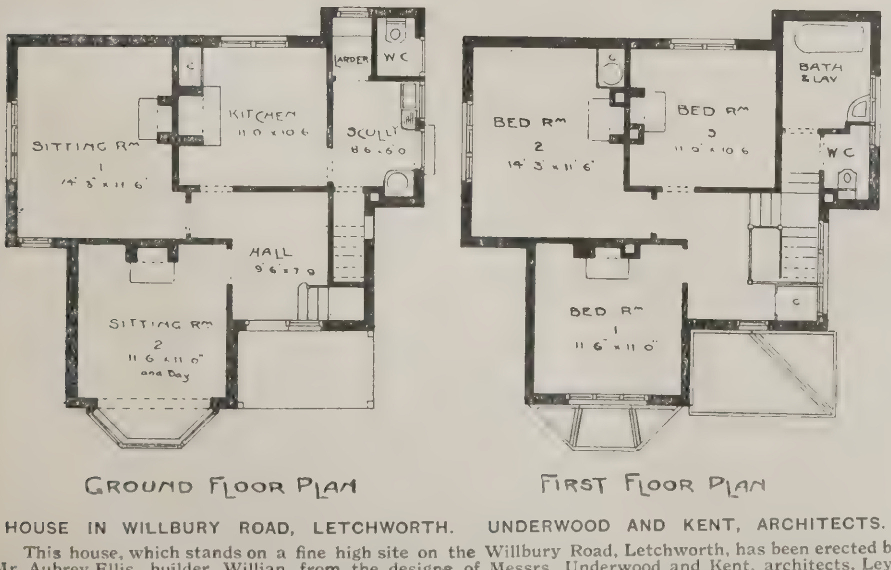
The Technical Institute for Colchester Competition.

"The Contract Journal" of the 6th instant takes strong objection to the awards recently made in this competition. The Colchester District Higher Education Sub-Committee of the Essex County Council invited about twenty architects to submit designs for this building, and offered premiums of 30, 20, and 10 guineas, respectively, for the three best designs. Instruction 12 to the competitors reads as follows:—"It is desired to keep the cost within the sum of about £10,000," and Instruction 6 is worded as follows:—"In case, on the receipt of tenders to carry out the accepted plan, the lowest of such tenders shall be found to exceed by more than five per cent. the amount of the estimate, which shall have accompanied the plans approved by the committee, the committee shall be at liberty to reject such plans." The assessor has selected for the first premium a design estimated to cost £16,500; for the second premium a design estimated to cost £14,204; and for the third premium a design estimated to cost £12,800. Our contemporary observes thereon: — "The first prize was, therefore, awarded for a design which totally disregarded one of the most important terms of the competition, namely, the cost; a design admittedly of no more use to the Colchester committee than a copy of the design for the technical institute for Birmingham or of the Imperial Institute." A letter has been sent to competitors stating that "owing to the excessive cost of the design placed first by the assessor the committee are unable to appoint the authors as architects." Apparently only one design is estimated by its authors to work out at the stipulated cost of "about £10,000," and this "with slight modifications," the committee are thinking of carrying out. We are not quite certain against whom our contemporary's indignation is directed for this state of things, unless it be the assessor. But inasmuch as it is admitted that the accommodation required is "of no limited or modest dimensions, and it is no wonder that only one design, No. 8, complied with the £10,000 limit" (and it is not yet known that this design can be carried out for that sum, or within the margin of 5 per cent. above it, as stipulated in Instruction 6), we do not feel constrained to blame either the assessor or the competitors. The trouble is probably due entirely to the action of the sub-committee; and is the result of the vicious manner in which these competitions are instituted. The difficulty would doubtless not have arisen if the sub-committee had called in their assessor at the beginning and said "We want such and such accommodation, and we have so much money to pay for it. Can we do it?" The assessor, if he was at all fitted for his position, would very quickly decide whether the accommodation must be diminished or the money increased. The competition would then be instituted on reasonable and satisfactory lines, the assessor drawing up the conditions and instructions. But these committees draw up their own conditions, usually with the assistance of the surveyor, every member adding his own fad to the main scheme, the competition is started, and the assessor is then appointed to select the best design. We think it his duty, in such a case as the present, to state very strongly in his report that the demands of the authority are impossible of fulfilment on the sum allowed; and he has therefore selected the three best designs irrespective of cost. It may be noted, too, that the sub-committee has stated definitely that £10,000 is the limit of cost allowed. "It is desired" to keep the cost within . . "about £10,000." This leaves every competitor in a hopeless muddle; since he does not know whether to strip his building of every atom of architectural merit, or how low a standard to adopt to render his success probable. The first duty of every public body, instituting a competition, is to select an assessor and secure his advice at the start, and if they do not do so they have only themelves to blame if the results are unsatisfactory. And if there is an absolute limit as to cost it should be stated in clear and unmistakable terms, and not in the vague indefinite terms in the conditions of this Colchester competition.

Bury Elementary School.

The award in the competition for a new elementary school in the Elton Ward (not to be confused with that for a secondary school, the result of which we published last week), was announced on the 5th instant, as follows: 1st, Mr. Frank S. Biram, St. Helens; second, Mr. G. E. Bolshaw, Southport; third, Messrs. France and Laycock, Manchester. Mr. John W. Simpson, Fellow and Vice-President of the R.I.B.A., was the assessor, and twenty-three designs were submitted.





GROUND FLOOR PLAN FIRST FLOOR PLAN

HOUSE IN WILLBURY ROAD, LETCHWORTH. UNDERWOOD AND KENT, ARCHITECTS.

This house, which stands on a fine high site on the Willbury Road, Letchworth, has been erected by Mr. Aubrey Ellis, builder, Willian, from the designs of Messrs. Underwood and Kent, architects, Leys Avenue, Letchworth. The walls, up to the cill level, and also the chimneys, are built of red facing bricks, with white mortar joints, and the other portions are roughcast. The roofs are covered with red tiles.

Rivelin Valley Village Scheme, Sheffield.

The "Sheffield Daily Telegraph" laments the want of enthusiasm displayed by Sheffield architects in a competition for laying out the Rivelin Valley Estate, belonging to the Waterworks Department of the Sheffield Corporation. The intention is to promote an ideal vilage or garden city, and premiums of £21 and £10 10s. were offered; but less than a dozen designs were received. The professional assessors are Messrs. E. Holmes, Assoc.M.Inst.C.E., E. M. Gibbs, F.R.I.B.A., and Peter Marshall, and with them are associated Ald. Styring, chairman of the Waterworks Committee, and Mr. Terry, general manager of the Waterworks Department.

Doncaster Municipal High School.

The Corporation have received the designs for the above to be erected at a cost of £12,000, exclusive of the site. Mr. E. R. Robson, F.R.I.B.A., of London, is the assessor.

Dumfries and Maxwelltown Fever Hospital.

The Town Councils of Dumfries and Maxwelltown have resolved to invite competitive plans for an infectious diseases hospital in the neighbourhood of the Stoop, on which an eminent architect will be asked to adjudicate. The successful architect will be entrusted with the work at the usual fees, and premiums of £10 and £5 wil be awarded to the designs placed second and third respectively. The buildings are not to exceed a cost of £3,500, and are to provide accommodation for twenty patients, with the necessary administrative offices. The walls are to be built of brick, rough-cast.

Palais de Justice, Toulon.

The competition for the reconstruction of the Palais de Justice and prison at Toulon has been decided as follows:—1st (5,000 francs), Mr. Monestel, Toulon; 2nd (3,000 francs), M. Georges Debrie, Paris; 3rd (1,500 francs), M. Roustan, Toulon; 4th (500 francs), M. Gassier, La Seyne (Var).

Whitley Bay Public Shelter.

In the competition for the above, held recently, the premium of £20 has been awarded to Mr. Edward Cratney, of Wallsend-on-Tyne and Sunderland.

Blackpool Central Library Competition.

We have received the following letter from "Competitors":—

Sir,—It is not often that architects make a protest on the appointment of an assessor before his award has been made known, but under the circumstances we think the profession has just cause for complaint. Seeing the assessor has not started to view the designs a timely warning might be of service to him. At the outset, many complaints were made about the conditions—these have now been amended—though the most important point of all has been overlooked, namely, the selection of an assessor. Mr. Searles-Wood resigned his appointment voluntarily, and in his place we have Mr. Willoughby. Over 141 architects are competing, and had they known previously who was the assessor the majority would have withdrawn. Should this award prove at all satisfactory it will be a pleasant surprise to the profession. It will be a refreshing change to many of us—with library experience—who have competed in many competitions in Lancashire; and have been bitterly disappointed in the results. We think the R.I.B.A. ought to have taken up the case and suggested an assessor from another district, as the present assessor must know both the work and authors of many of the designs submitted, and his recent awards have given great dissatisfaction to competing architects.

Middlesbrough Library Competition.

We have received the conditions for the above, and call the attention of competitors to certain clauses which require amending. The general conditions and instructions are fairly reasonable. We note a somewhat indefinite request that ought to be definite. It states that "a competitor may at his discretion, send in an anonymous "report," explanatory of any detail or details of his design not made clear by the plans, and this will be marked with the same number as the plans." This, it is assumed, is just the ordinary report and estimate, and should be made binding on every architect, otherwise what is the use of a design being submitted without an estimate and description of the building materials? There is only a five per cent. margin allowed if the tenders exceed £12,000. This is a point which corporations are cutting down to a minimum. It is generally too small a margin, and unreasonable in the case of an outside architect erecting a building in a district where he is not conversant with the local building materials, prices and trade customs. The site for the proposed library will prove a difficult one for most competitors to plan, as the suggested dimensions and arrangements—apart from the awkward shape of the site—have been prepared from a preliminary plan which must have been void of all balance or architectural conception, and at the same time portrays not even an elementary knowledge of the requirements of a library. Almost a square space, 54ft. by 38ft. is suggested for the new room. This is on a par with the "Furnace," boiler, and coke-store, which has to be 15ft. by 10ft., hardly the size for the comfortable firing of adjacent boiler, let alone stores adjoining. We note that the staff lavatories are specified on the first floor, and the staff room in the "attic!" We wonder where the information was gathered from. The economical question has been carefully considered, as competitors have to utilise under gables as stores. These are a few of the quaint ideas which struck the genius who framed the conditions and who has the audacity to charge two guineas for such brilliant information. Otherwise the conditions show an endeavour for fair dealing, as a professional assessor will be appointed and his decision will be final.

At the Hampshire Quarter Sessions, Sir William Portal moved a resolution asking the Court to concur in the removal to the Great Hall of Winchester Castle of the statue of Queen Victoria now standing in the Abbey Gardens, Winchester. Sir William pointed out that the statue was the gift to the county in the Jubilee year of 1887 by the then High Sheriff, Mr. W. Ingham Whitaker, and that it was intended by the donor to stand in the Great Hall at the western end, where, from the time of the Conquest, the Sovereigns of England convened Parliaments and administered justice for centuries. The plan was abandoned in consequence of the opposition of the late Mr. Melville Portal, then chairman of the Quarter Sessions, who failed to see any merit in the statue. He failed to grasp the audacious and altogether unconventional genius of Mr. Alfred Gilbert. His opinions, however, were not shared by the late Earl of Northbrook and the late Lord Montagu of Beaulieu, but after having been set up in the Castle yard and then removed and covered up, as a temporary expedient the Winchester Corporation gave it a place in the Abbey Gardens on the express condition that it should be returned if required. Sir Edward Poynter, P.R.A., and Mr. Thomas G. Jackson, R.A., had both advised its removal, and Mr. Gilbert himself, although somewhat disheartened at the treatment the statue had received, was willing to finish it. He had designed a special base for it, and the exquisite details would be completed at the expense of the son of the generous donor, Mr. Ingham Whitaker. Mr. E. Pember, K.C., seconded the motion, and sympathised with the city of Winchester in losing the statue. It was, he declared, the grandest representation of modern national art in England, and he was glad it was now going to be properly housed and taken care of. The feeling of the Royal Academy, not only the sculptors, but the painters, agreed with that of Sir Edward Poynter, and those who represented sculpture in the Academy were quite at one that this was an indoor statue, and that to do it justice it ought to be carefully housed indoors. The Court unanimously agreed to the proposal.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

The querist's name and address must always be given, not necessarily for publication.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s., made payable to Technical Journals Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

Books on Illuminating.

ABERDARE.—E.G.H. writes: "Please recommend a book that affords real assistance with respect to the production of illuminated addresses, etc."

We forwarded this enquiry to Mr. B. T. Batsford, 94, High Holborn, who kindly replies:—"The best book I can recommend your correspondent is the following: Tymms and Wyatt's 'Illuminating,' which contains 100 beautiful examples printed in gold, silver, colours, drawn from choice specimens of the sixth to the sixteenth centuries and comprising richly executed borders, initial letters, and alphabets. Royal 4to, cloth, published at £3 10s. for 30s. net."

District Surveyor's Fees.

The reply given to the enquiry in the issue of December 16th, with reference to a fee being chargeable by a district surveyor for new drainage to old buildings, is incorrect. The supervision of drainage is the province of the borough council's officers, and not of the district surveyor. The only fees payable to a district surveyor are those enumerated in the third schedule, and the by-laws of the London Building Act, and no fee is included for the supervision of drainage. If, however, the drains have necessitated excavation within 3ft. of the building, the district surveyor is entitled to a fee of 5s. for superintending the filling in, according to the requirements of the by-law.

HERBERT KENCHINGTON.

Inserting Dampcourse in Existing Building.

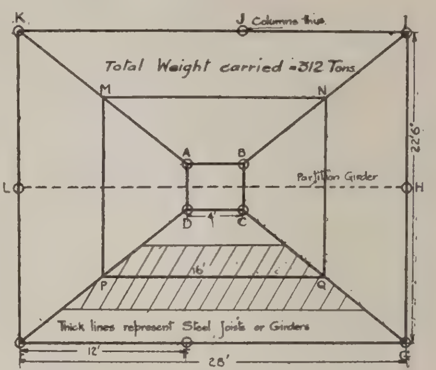
PONTYPRIDD.—G.L.M. writes: "Where the damp-course has been omitted from a building, what is the best means to adopt to counteract the dampness which has arisen? The level of the surrounding ground is at least 6ins. below the level of the floor."

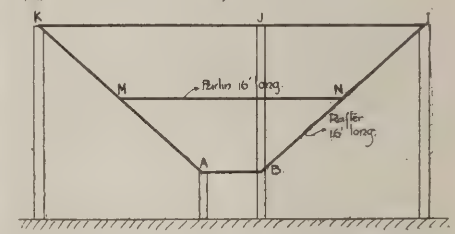
Underpin the walls, and put in the damp-course, which should preferably be bitumen, so that it can be properly joined in short lengths. A double course of solution and cement might also be used, but bitumen would be best. Presuming that the walls have proper concrete foundations, the soil might be cleared away and a vertical asphalt dampcourse could be brought up from the foundation to above ground level. If the soil is cleared away to below the level of the concrete foundation under the floors, there would not then be much probability of the damp getting into the walls. If, however, the walls have not a good foundation of concrete, we do not think there is any way of making a good job of the work short of underpinning, as stated.

Ascertaining Stresses for Barley Bins.

GREAT YARMOUTH.—K.A.C. writes: "The accompanying diagram shows details of the constructional steelwork to barley bins. I desire to ascertain the stresses on the various members."

Figs. 1 and 2 show diagrammatically the plan and elevation of the bins. To determine accurately the loads carried by the various supports is a matter of very great difficulty, and it is practically impossible because theoretically the load would depend on the size and elasticity of each support. The stresses in, and loads carried by, the various joists are also very difficult to determine accurately, but the writer believes that the following method of attack is as satisfactory as any. Divide the plan up into 4 pieces,


K
J Columns thus.
I
Total Weight carried =312 Tons
M
N
A
B
L
H
Partition Girder
D
C
4'
16'
P
Q
22'6"
Thick lines represent Steel Joists or Girders
12'
28'
E
G



one of which is EDCG. The total load is 312 tons, exclusive of building materials, or, say, 320 tons altogether. Then the purlin PQ carries the area shown shaded, i.e, about one half of the load on the portion EDCG, i.e., about ⅛ total load, or 40 tons. For a span of 16 feet this gives a bending moment $\frac{40 \times 16}{8}$ = 80ft. tons. To get this with a single joist an 18in. by 7in. British Standard on a 14in. by 12in. broad flange beam could be used. The purlin P Q distributes 20 tons at P and Q to the rafters E D and C G, and the purlins M P and Q N also each distribute 20 tons at P and Q respectively. ∴ total load at P = 40 tons. This is a central load, and is equivalent to a uniformly distributed one of 80 tons, so that as the horizontal projection of the span is about 15ft, the maximum B M = $\frac{40 \times 15}{4}$ = 150ft. tons. ∴ necessary section modulus of girder = $Z = \frac{150 \times 12}{7}$ (using 7 tons per sq. inch as the same stress), i.e., $Z = 257$ inch units. A built-up section or two beams as indicated above side by side would be necessary for this. This calculation neglects the direct thrust which will come down the rafters, but this is comparatively almost negligible (about ¼ ton per sq. inch). These rafters distribute a load at each of the points A B C. D = $\frac{40}{2}$ = 20 tons, and 20 tons at each of the points E, K, I, G. The joist D C carries about 1-16 of the load on piece E D C G, i.e., 5 tons, so that at each point such as D, $\frac{5}{2} = 2\frac{1}{2}$ tons is distributed from each of the joists such as A D, D C. This makes the total load carried at each of the points A, B, C, D, 25 tons. Now take the girder E G. It is a continuous girder of spans, respectively 12 and 16ft., and the load carried is $\frac{7}{16}$ of the load on the portion E D C G, i.e., 35 tons or 1¼ tons per ft. Then by the theorem of three moments.

$$12 M_E + 2 M_F (16+12) + 16 M_G = \frac{1\frac{1}{4}}{4}(12^3 + 16^3)$$

$$\text{but } M_E = M_G = O.$$

$$\therefore 56 M_F = \tfrac{5}{16} \cdot 4^3(3^3 + 4^3)$$

$$M_F = \frac{5 \times 91}{14} = 32\cdot5 \text{ ft. tons.}$$

The girder must be able to carry this (14in. × 6 in. × 46 lb. would do).

Then load on F = $\frac{35}{2} + \frac{32.5}{14} + \frac{32.5}{16}$ = $17.5 + 2.32 + 2.03 = 21\frac{3}{4}$ tons nearly.

Load at E from this girder = $\frac{15}{2} - 2.32 = 5\frac{1}{4}$ tons nearly.

Load at G from this girder $= \frac{20}{2} - 2.03 = 8$ tons nearly.

Finally consider girder E K. This carries 35 tons and has two continuous equal spans of 11 ft. 3 in.

$$\text{Max. BM} = \frac{35 \times 11.25}{16} = 23.8 \text{ ft. tons.}$$

$$\left(\frac{Wl}{16} \qquad W = \text{Total load} \atop \qquad l = \textit{Each} \text{ span}\right)$$

Load on column L $= \frac{5}{8} W = \frac{175}{8} = 22$ tons nearly.

Load on column K E $= \frac{3}{16} W = 6\frac{1}{2}$ tons nearly.

Summing up our results as to the loads carried we have:—

Stanchions A, B, C, D, 25 tons each	100 tons.
Columns E, I, $= 20 + 5\frac{1}{4} + 6\frac{1}{2} = 31\frac{3}{4}$ each	$63\frac{1}{2}$ „
„ K, G, $= 20 + 8 + 6\frac{1}{2} = 34\frac{1}{2}$ each	69 „
„ L, H, = 22 tons each ..	44 „
„ F, G, $= 21\frac{3}{4}$ each ..	$43\frac{1}{2}$ „
Total ..	320 tons.

L and H carry in addition half the weight of the partition girder. A.

Details of Lead Work on Turret.

SOHAM.—LEADWORK writes: "The turret shown by the accompanying section and elevation is to be wholly covered with lead. I should be glad to know the proper method of working same. No solder is supposed to be used. (1) Where should the joints be made horizontally? (2) Where should the vertical welts appear? (3) How should the angles of mouldings marked A be worked? (4) How should the lead be worked over and around the projections marked B appearing on the faces of the main portion? Should the lead be worked in one piece from G to C, and bossed round these projections? (5) What is the best method of fixing the lead to the woodwork? Please say where the fixings should occur."

No scale is given (an important detail where jointing is in question); but assuming the original drawing to be 1in. scale, the jointing should be as follows:—(1) The covering of base should be dressed up over bottom member of moulding and copper nailed. The mouldings should be bossed up in comparatively narrow strips, copper nailed at top edges as shown, and the free lower edges held in position by light copper clips about 18in. apart to prevent serious movement or disturbance by wind. The weathering of base mould should be dressed up the face of the turret to the height shown by dotted line, bossed over projection B, and fixed with secret copper tacks sweated to back of lead and turned through slots cut in boarding, leaving a slight amount of freedom for movement during expansion and contraction of lead. Sinkings should be formed by the carpenter where double thicknesses of lead occur, to produce a sightly effect. The remainder of each face of turret may be formed in one sheet, lapping at bottom over weathering of face mould, cut to form of bottom edge of centre panel, and from corners of same Y.Y. obliquely to Z.Z. The cornice mould may be treated similarly to base, but an alternative suggestion for the formation of a drip is shown, in which case the lead clips are secret. The final X should be bossed up from one sheet of lead. (2) The vertical welts should be formed on the angles at C., with, say, three secret tacks in each. If the scale has been correctly assumed, no further vertical joints should be necessary. (3) A mitre and short return should be bossed up at the alternative angles of mouldings as shown, and the surface of lead dressed into a sinking, so that this does not project where laying over the undercloak. (4) The lead should be bossed round the projections B. The remainder of this question has been answered incidentally to the preceding ones. (5) The lead should be fixed with secret tacks of stout copper, soldered to back of same and turned through slots cut in the boarding. This will be less unsightly than soldered dots, and allow more movement with less risk of cracking. The positions are dotted on the diagrams. G.

Floor for a Roller Skating Rink.

DARWEN.—EXPERIENCE writes: "I saw a recent inquiry as to what is the best floor for a skating rink. I may say from personal experience that the patent flooring called Firmit would answer this purpose. In several of these buildings I have found that a bit of green colour has been introduced, which in artificial light looks somewhat like ice."

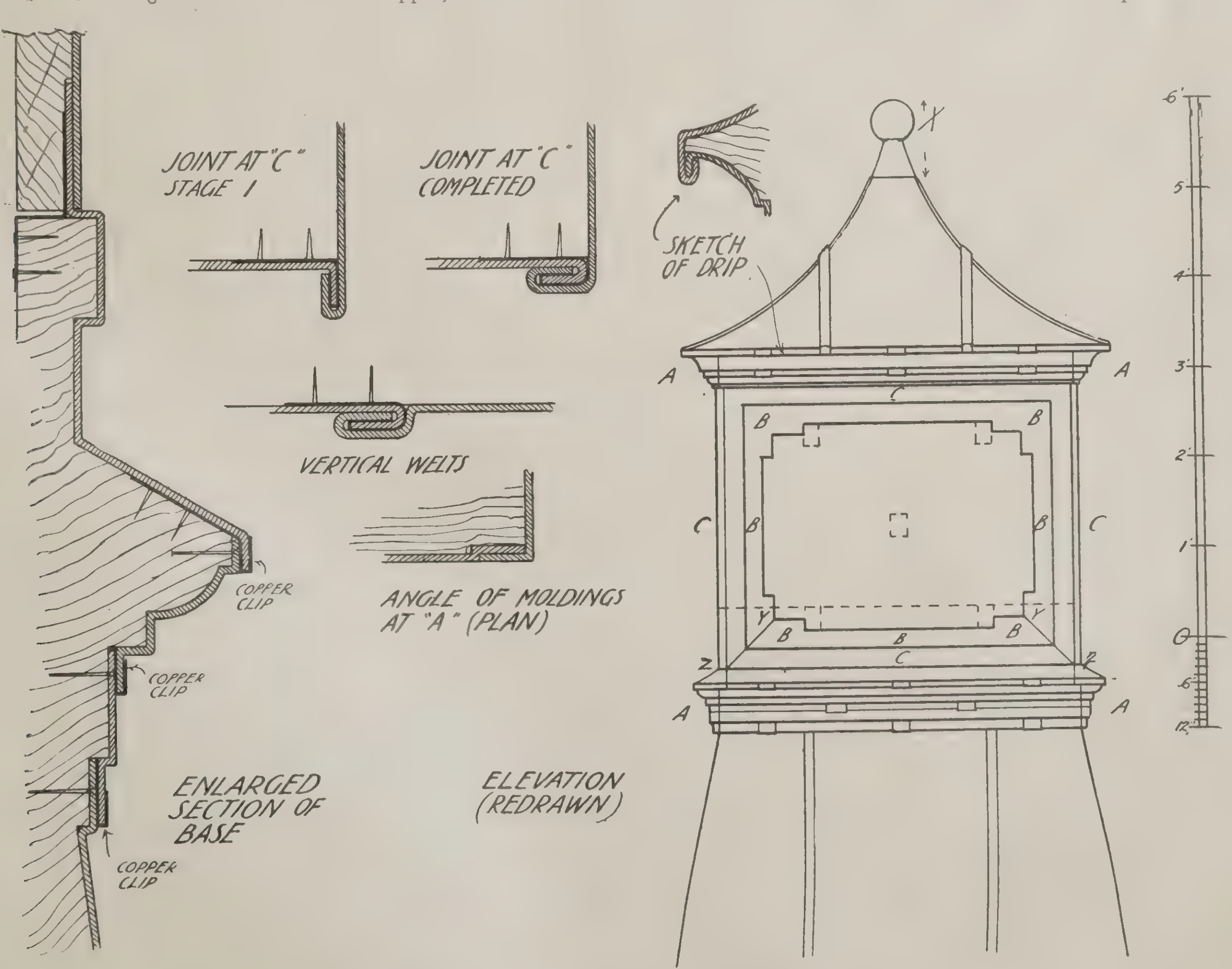
Lantern Slides of Mediæval Architecture.

LONDON.—H. K. writes: "In regard to the inquiry by 'T. Square' of December 30th, there is a loan collection of lantern slides belonging to the Architectural Association, which includes a number illustrating the domestic architecture of the periods mentioned. Full particulars may be obtained from the secretary."

"Notice to Treat" Under the Housing of the Working Classes Acts.

TWICKENHAM.—T. H. S. writes: "After a borough council have served notice to treat under the provisions of the Housing of the Working Classes Acts, how soon after the service of that notice can they be compelled to proceed in the matter?"

The Housing of the Working Classes Act, 1890, incorporates many of the provisions of the Lands Clauses Acts, and the procedure must be in accordance therewith. After a "notice to treat" has been served, the owner must send in a formal claim. If the amount claimed be over £50, the owner may elect whether, in case the claim is not paid, he shall go to a jury or have the amount settled by arbitration. No unnecessary delay must take place in any case; but should he go to a jury, they must be summoned within twenty-one days, and will, of course, give an immediate verdict. The purchase must be



DETAILS OF LEAD WORK ON TURRET.

completed within one year of the first making of the order by the local authority (Section 38, 4). I advise you to get a copy of the Act, the cost is merely a few pence.—F.S.I.

Ascertaining Stresses in Roof Trusses.

London, W.C.—W. A. G. writes: "I was interested in reading the answers to 'Enfield O.S.D.'s' query regarding 'Ascertaining of Stresses in Roof Trusses,' appearing in your issue of November 25th. May I be permitted to suggest that A's reasoning is fallacious to judge by results, as the member C D (please refer to the sketch printed with the article) is obviously in compression?"

Cost per Cubic Foot of Public Buildings.

Bexhill.—W. G. writes: "What is the average cost per cubic foot of such works as the Lambeth Municipal Buildings?"

The cost of the Lambeth Municipal Buildings works out at 11½d. per cubic foot. Probably 1s. per foot would be a fair average estimate of the present cost of buildings of a like nature.

Aspects of Trade Unionism.

Yorks.—Cœur-de-Lion writes: "Can you please give me dates of issues in which have been published articles, papers, or comments dealing with such aspects of trades unionism as (1) Limitation of output; (2) standardisation of wages irrespective of ability; (3) loss of personal incentive; and such others as may bear upon the same theme."

Such topics have been, as a rule, touched upon but lightly in our pages, and have only been noticed when it has been found impossible to ignore them. More or less helpful references to some of the matters mentioned by the querist occur as follows:—Trade Union Congresses: p. 94, Sept. 16th, 1896; p. 104, Sept. 12th, 1900; and p. 100, Sept 16th, 1903. Bricklaying and Trade Unionism: p. 260, Nov. 27th, 1901; p. 274, Dec. 4th, 1901; p. 294, Dec. 11th, 1901; p. 332, Dec. 25th, 1901.

TEXT BOOKS APPROVED BY THE BOARD OF ARCHITECTURAL EDUCATION.

The Council of the R.I.B.A., on the recommendation of the Board of Architectural Education, have issued as a supplementary paper the list of books drawn up by a Joint Committee of members of the Board of Architectural Education and of the Board of Examiners, and recommended to students preparing for the Institute examinations. The list, which will be revised and amended as occasion requires and printed in the Institute Kalendar, is as follows:—

General.

Atkinson, T. D.: English Architecture. 8o. 1904.
Belcher, J.: Essentials in Architecture. 8o. 1907.
Brown, G. Baldwin: The Fine Arts. 8o. 1902.
Brown, G. Baldwin: Arts in Early England. 2 vols. 1903.
Choisy, A.: Histoire de l'architecture. 2 vols. 8o. 1899.
Choisy, A.: L'art de bâtir chez les Egyptiens. 8o. 1904.
Cummings, C. A.: History of Architecture in Italy, from the Time of Constantine to the Dawn of the Renaissance. 2 vols. 8o. 1901.
Fergusson, J.: History of Architecture of all Countries. 5 vols. 8o. 1876-1893.
Gwilt, J.: Encyclopædia of Architecture. 8o. 1888.
Simpson, F. M.: A History of Architectural Development. 8o. 1905.

Classic.

Anderson, W. J., and Spiers, R. Phenè: Architecture of Greece and Rome. 8o. 1908.
Cockerell, C. R.: Temples of Jupiter Panhellenius at Ægina; and of Apollo Epicurius at Bassæ. fo. 1860.
Chambers, Sir W.: Civil Architecture. fo. 1759; or 2 vols. 8o. 1825.
d'Espouy, H.: Fragments d'Architecture antique. fo. 1896.
Gardner, P.: Grammar of Greek Art. 8o. 1905.
Gibbs, J.: Rules for Drawing the Several Parts of Architecture. fo. 1732.
Middleton, J. H.: Remains of Ancient Rome. 2 vols. 8o. 1892.
Normand, C. J. P.: The Orders of Architecture. fo. 1829.
Penrose, F. C.: Principles of Athenian Architecture. fo. 1851; or 1888.
Spiers, R. P.: The Orders of Architecture. 4o. 1902.
Stuart, J., and Revett, N.: Antiquities of Athens. 4 vols. fo. 1762-1816.
Taylor, J. L., and Cresy, E.: Antiquities of Rome. 2 vols. fo. 1821-22.
Gwilt's Translation of Vitruvius. 8o. 1826.
Watt, J. C.: Examples of Greek and Pompeian Decorative Work. fo. 1897.

Byzantine.

Choisy, A.: L'art de bâtir chez les Byzantins. fo. 1883.
Lethaby, W. R., and Swainson, H.: Church of Sancta Sophia, Constantinople. 8o. 1894.
Ongania, F.: Basilica di San Marco. 13 vols. fo. and 4o. 1881-88.
Salzenburg, W.: Alt Christliche Baudenkmale von Constantinopel. fo. 1854.
Schultz, R. W., and Barnsley, S. H.: Church of St. Luke of Stiris, etc. fo. 1901.

Mediaeval.

Atkinson, T. D.: A Glossary of English Architecture. 8o. 1906.
Bilson, J.: The Beginnings of Gothic Architecture. 4o. S.P. 1899.
Bond, F.: Gothic Architecture in England. 8o. 1906.
Bowman, H., and Crowther, J. S.: Churches of the Middle Ages. fo. 1857.
Brandon, R. and J. A.: Analysis of Gothic Architecture. 2 vols. 4o. 1849.
Britton, J.: Cathedral Antiquities. 14 vols. 4o. 1814-35.
Collings, J. K.: Details of Gothic Architecture. 2 vols. 4o. 1852-56.
Collings, J. K.: Gothic Ornaments. 2 vols. 4o. 1848-50.
Corroyer, C.: L'Architecture gothique. 8o. 1891.
Dollman, F. T., and Jobbins, F. R.: Analyses of Ancient Domestic Architecture in Great Britain. 2 vols. 4o. 1861-3.
Dehio, G., and Von Bezold, G.: Kirchliche Baukunst des Abendlandes. 8 vols. fo. and text 8o. 1884-01.
Enlart, C.: Manuel d'archéologie française. 2 vols. 8o. 1902-04.
Lethaby, W. R.: Mediæval Art. 8o. 1904.
Parker, J. H.: Glossary of Terms used in Architecture. 3 vols. 8o. 1850.
Prior, E. S.: Gothic Art in England. 8o. 1900.
Pugin, A.: Examples of Gothic Architecture. 3 vols. 4o. 1831-38.
Révoil, H.: Architecture romane du Midi de la France. 3 vols. fo. 1873.
Ruprich-Robert, V. M. C.: L'architecture normande aux xie et xiie siècles. 2 vols. fo. 1884-89.
Scott, G. G., jun.: Essay on the History of English Church Architecture. 4o. 1881.
Sharpe, E.: Architectural Parallels. fo. 1848.
Sharpe, E.: The Mouldings of the Six Periods of Gothic Architecture. 4o. 1871-74.
Street, G. E.: Brick and Marble of the Middle Ages in Italy. 8o. 1874.
Street, G. E.: Gothic Architecture in Spain. 8o. 1865.
Viollet-le-Duc, E. E.: Dictionnaire raisonné de l'Architecture française. 10 vols. 8o. 1854-68.
Willis, R.: Vaults of the Middle Ages. 4o. S.P. 1842.

Renaissance.

Adams, R. and J.: Works in Architecture. 3 vols. fo. 1778-1822.
Belcher, J., and Macartney, M.: Later Renaissance Architecture in England. 2 vols. fo. 1901.
Berty, A.: La Renaissance monumentale en France. 2 vols. 4o. 1864.
Birch, G. H.: London Churches of the Seventeenth and Eighteenth Centuries. fo. 1896.
Blomfield, R.: Renaissance in England 1500-1800. 2 vols. 8o. 1897.
Campbell, C.: Vitruvius Britannicus; with Supplement by Woolfe and Gandon. 5 vols. fo. 1715-71.
Cicognara, L.: Fabbriche e i monumenti conspicui de Venezia. 2 vols. fo. 1838-40.
d'Espouy, H.: Fragments d'Architecture de la Renaissance. fo. (1897).
Geymüller, H. von: Baukunst der Renaissance in Frankreich. 8o. 1898.
Gotch, J. A.: Architecture of the Renaissance in England. 2 vols. fo. 1894.
Kent, W.: Designs of Inigo Jones. fo. 1727.
Letarouilly, P.: Edifices de Rome moderne. 3 vols. fo. 1840-60.
Palustre, L.: Renaissance en France. 3 vols. fo. 1870.
Raschdorff, J. C.: Palast-Architektur: Toscana. fo. 1888.
Raschdorff, O.: Palast-Architektur Venedig. fo. 1903.
Reinhardt, R.: Palast-Architektur: Genua. fo. 1886.
Sauvageot, C.: Palais, Châteaux, Hôtels et Maisons de France. 4 vols. fo. 1867.
Triggs, H. Inigo, and Tanner, H.: Works of Inigo Jones. fo. 1901.

Geometry.

Binns, W. S.: Geometrical Drawing. 8o. 1864.
Davidson, E. A.: Practical Perspective. 8o. 1886.
McGoodwin, H.: Architectural Shades and Shadows. 4o. 1904.
Spanton, J. H.: Science and Art Drawing. 8o. 1895.

Materials: Their Nature and Application.

Butler, D. B.: Portland Cement. 8o. 1905.
Ellis, G.: Modern Practical Carpentry. 8o. 1906.
Ellis, G.: Modern Practical Joinery. 8o. 1908.
Johnson, J. B.: Materials of Construction. 8o. 1908.
Newland, J.: Carpenters' and Joiners' Assistant. 4o. 1860.
Purchase, W. R.: Practical Masonry. 8o. 1904.
Rivington's Notes on Building Construction. Vol. III. 8o. 1904.

Hygiene, Sanitary Science, Heating, etc.

Jukes, Clement: Schol Hygiene.
Hood, C.: Warming by Hot Water. 8o. 1897.
Jones, W.: Heating by Hot Water, etc. 8o. 1904.
Knight's Annotated Model By-laws. 8o. 1905.
Maxwell, W. H.: Ventilation, Heating, and Lighting. 8o. 1907.
Miers, H. A. and Crosskey, R.: The Soil in Relation to Health. 8o. 1893.
Model By-laws. L.G.B.
Parkes, L. C., and Kenwood, H. R.: Practical Hygiene. 8o. 1907.
Reid, G.: Practical Sanitation. 8o. 1908.
Sutcliffe, G. L.: Sanitary Fittings and Plumbing. 8o. 1901.

Specification, etc.

Dicksee, B.: London Building Acts (for London students). 8o. 1906.
Dilapidations. (R.I.B.A. publication.) 8o. 1903.
Hudson, A. A.: Law of Building Contracts. 2 vols. 8o. 1907.
Leaning, J.: Quantity Surveying. 8o. 1904.
Leaning, J.: Specifications. 8o. 1901.
Macey, F. W.: Specifications. 8o. 1904.
Rea, J. T.: How to Estimate. 8o. 1908.

Strength of Materials and Construction.

Adams, H.: Practical Designing of Structural Ironwork. 8o. 1894.
Adams, H.: Strains in Ironwork. 8o. 1884.
Berg, L. de C.: Safe Building. 8o. 1892.
Brickwork Tests. (R.I.B.A. publication.) 8o. 1905.
Charnock, G. F.: Graphic Statics. 2 vols. 4o. 1899.
Hardy, E.: Graphic Statics. 8o. 1904.
Middleton, G. A. T.: Stresses and Thrusts. 8o. 1904.
Reinforced Concrete. (Report of Joint Committee.) 4o. 1907.
Rivington's Notes on Building Construction, Vol. IV. 8o. 1904.
Scott-Moncrieff, G. K.: Principles of Structural Design. 2 vols. 1897-8.
Stock, C. H.: Shoring and Underpinning. 8o. 1902.
Unwin, W. C.: Testing of Materials. 8o. 1899.

Correspondence.

The Mersey Dock and Harbour Board Offices.

To the Editor of The Builders' Journal.

Sir,—With reference to your published list of contractors for the work at the New Dock Offices, Liverpool, in your issue of December 30th, we should like to draw your attention to the fact that the interior, as well as the exterior, electric light fittings were executed by us in our studios and workshops in Manchester.

George Wragge, Ltd.

The Proposed Guild of Architects' Assistants.

To the Editor of The Builders' Journal.

Sir,—On perusing the letter by "Architect," in the Builders' Journal of December 9th, on the question of "A Guild of Architects' Assistants," I was struck by the remarks of the writer with regard to the (in the writer's opinion) essentiality of assistants possessing private means. Of the many assistants in the town of Leicester who are personally known to me, not 5 per cent. have private means, and I am sure that such a fact makes them none the less keen in their work, although they may never be principals.

Most of the arguments in "Architect's" letter only go to further emphasise the burning necessity for the formation of some such Guild as outlined by "Assistant." The disgraceful fact, that it is practically impossible for a middle-aged assistant once out of employment to obtain work, surely is not consistent with the "dignity of the profession," of which we hear so much. I am strongly in favour of forming a Guild, and have obtained the opinions of many assistants of my acquaintance in Leicester, and I can safely guarantee that at least twenty are prepared to support the movement. The letter by "Assistant" exactly puts into words what has been my opinion, and the opinion of many others for some time, and I trust that they will not let the opportunity slip, of supporting a movement that would be to the ultimate good of the profession at large, and would also tend to the advancement of architecture.

Leicester.

CONTRACTORS' SECTION.

(MONTHLY.)

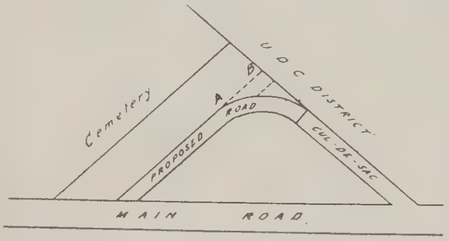
"APPLICATIONS" UNDER THE LONDON BUILDING ACTS.

By **B. Wyand.**

(*Concluded from page* 4, No. 726.)

No objection can be taken to these requirements—except, perhaps, in certain cases, to the one relating to direct communication—so long as the Council exercise their power in a fair and equitable manner. Unfortunately, however, officialism is somewhat too pronounced, and the applicant is entirely at the mercy of a coterie of gentlemen whose mission would appear to be, in the first place, to refuse applications; secondly, to grant them if no other alternative is possible. Should no legitimate flaw be found in the plans, some point for which no provision has been made may be raised, and this will be discussed in all its bearings and application after application refused. Failing any other resource, the applicant may be asked point blank: "How much of your land are you going to give us?" any demur being met with by an expression of grave doubt as to the probable chance of success of the application. When there is a legitimate objection, on the other hand, it becomes a matter of arrangement, the Council being ready not infrequently to sanction a direct violation of their regulations if the applicant is prepared to pay for the concession. I will relate one of my experiences in connection with the laying out of an estate within the county of London, as an illustration of what I have said.

The estate was situated on the border of the county, the adjoining land being within the district of an urban council, in the county of Middlesex, and as yet undeveloped. Running right into the estate was a 40ft. road, with a dead end, forming that abomination, a cul-de-sac. One side of this road was fully built upon, with houses of a good class. The only mode of dealing with the estate (which was of triangular form) was by running a new street in from the main road, through the centre of the estate, and out again into the main road. There was no possibility of a through road communicating with other roads, the three sides of the estate being formed by a cemetery, the undeveloped land aforesaid, and the main road. In order to mitigate the evil arising from the proposed crescent road, I arranged for the cul-de-sac to form part of it, thus doing away with one very objectionable feature and substituting for it one of a much less objectionable nature. The plans were rejected (under Section 9, Sub-Section 4, of the Act), the rejection being accompanied by a verbal intimation that my client must give up a strip of land 7ft. deep for the purpose of widening the main road. In submitting the plans for a second time, I drew the attention of the Council to the fact that some three years previously a certain agreement had been come to between the borough council and my client, whereby, in consideration of my client relinquishing certain land, the borough council undertook to be satisfied with a 53ft. road in lieu of a 54ft. at that portion of the main road upon which my client's estate abutted. "The road is now 53ft. wide," I said, "and I trust that you will reconsider the matter. My client has performed his part of the agreement, and should not be called upon further to concede his rights." I pointed out, too, that the throwing of a 7ft. strip into the main road would mean the destruction, for the whole length of the frontage, of a very fine row of timber trees. The Council was obdurate, however, and again threw out the plans. A third set was submitted, and this time, by giving up a 4ft. strip and carrying a short length of road (as shown on sketch, at AB), running to the boundary, which would of necessity form a cul-de-sac for many years, if not for ever, the plans received approval. In all, the County Council received ten complete sets of tracings (excluding the duplicate supplied for the use of the borough council), for it is the rule of the former body that no plan submitted is ever returned. Were complete plans of a building to cost £20,000,000 to be submitted, and one of the railing heads of the boundary fence to project half-an-inch upon the public footway, a complete new set of drawings in duplicate would be called for. I need not enlarge upon this phase of the subject, however. In the case I have outlined above, the trouble all arose over the strip of land which the Council thought they would like to acquire. They had not the least right to it; indeed, they had less than no right, for an agreement had been entered into to the opposite effect; but they meant to have it if possible. Hence all the trouble, with the creation by them of a cul-de-sac to take the place of the one opened up.



Reinforced concrete construction is recognised in the Bill that is being brought before Parliament next session by the Manchester Corporation, one of the clauses providing that "Notwithstanding any provisions contained in any public or local Act or bylaw in force within the city regulating the construction of buildings, the Corporation shall have power to relax or modify such provisions in the following cases:—Where a person is desirous of erecting an iron, steel, or reinforced concrete building or structure, or any other building to which the general provisions of the said Acts or by-laws are inapplicable, or, in the opinion of the corporation, inappropriate, he shall make an application to the corporation, accompanied by complete plans, sections, and elevations of the proposed buildings, with such details and other particulars as to the construction thereof as may be required by the corporation. The corporation may, for the purpose of regulating the procedure in relation to such application, issue such general rules as they think fit as to the plans, sections, elevations, details and particulars to be presented."

WAYLEAVES FOR TELEPHONES AND TELEGRAPH POLES & LINES.

By **G. S. Mitchell, F.S.I.**

The useful though very unsightly lines and poles connected with the telegraphic and telephonic services, which are controlled as well by the Government as by private commercial enterprise, are rapidly growing more numerous, and however well disposed one may feel towards the progress of the modern methods of rapid intercommunication, it behoves the owner of landed property to safeguard his rights somewhat more jealously than has hitherto been needful; poles are often erected without the landowner's formal consent, and therefore without any written agreement as to their maintenance or removal.

Few persons appear to have any precise knowledge of the rights and powers respectively of the Post Office and of the Telephone Companies, and a great deal of friction and annoyance is experienced which might well be avoided if the real position of things were more generally understood.

I therefore propose to treat briefly with this somewhat obscure subject, and trust that the information which I have myself acquired when dealing with wayleaves of this description may prove of interest, and perhaps of service to the reader.

In the first instance it is necessary to recollect the fact that the presence of poles, attachments, and wires upon the property of another constitutes an easement in exactly the same way as a right of light or of way or to take water, etc., becomes an easement.

This being the legal position, it should not be forgotten that by the Prescription Act of 1838, the uninterrupted enjoyment of an easement "by common law prescription or grant" for a period of twenty years, prevents any action being taken to defeat it, and an owner of property upon which telephonic or telegraphic apparatus has been erected should therefore take care that a proper agreement is entered into by the owners of that apparatus containing among other provisions, a clause by which the landowner is enabled to terminate the arrangement and to call for the removal of the installation at reasonable notice.

The Telephonic Companies wayleave agreements are sometimes drawn to cover the whole period from the date of their execution until 1911, the year in which their licences from the Postmaster-General will expire, and when their lines will be absorbed in the National System then to be inaugurated; but these agreements are not generally to be adopted, because such an arrangement leaves the landowner no power to call for the alteration or removal of poles, etc., even though they may stand in the way of an alteration of his premises or may have become in some other manner objectionable to him.

The best agreement is one which provides for a reasonable notice—say, six months — on either side for the discontinuance of the easement it creates.

A very usual wayleave rental is one shilling per attachment or pole per annum, and this sum covers all the stays and wires which may be necessary to safely secure it, should those stays be upon the same owner's land—but so small a payment as a shilling is only a fair sum when the number of poles is numerous, and it is, of course, quite insufficient when only a single attachment is to be made or when a single pole is to be placed upon one's property. In such a case, if the owner allows the encroachment to be made at all, he should at least stipulate for a rental which will pay for its own collection and naturally in important positions this may be fixed at a substantial sum. I am no believer in the ordinary trifling "acknowledgment rental" of sixpence or a shilling per year, because so small a sum is apt to be lost sight of, or to be paid by a collector out of his own pocket in order that he may avoid the trouble of obtaining it from the person who should rightly pay it.

It need hardly be added that the presence of wires crossing a property forms an encroachment equally with the fixing of a post or standard, and should be paid for accordingly.

After all, the Telephone Companies are commercial undertakings, and though to some extent "pro bono publico," yet they are institutions founded for profit, and should pay what is fair for the privileges they acquire.

The question naturally arises "for what should payment be made?"

In the first place it is not usual to charge for the actual attachment to the house which is being served with the telephone, because that attachment is a necessary portion of the installation for the use of the occupier.

With this exception the Telephone Company should pay, at a price commensurate with its importance and the number of wires it carries, for every attachment to every building, and for each pole which they erect, whether that pole be upon enclosed land, or upon the roadside, notwithstanding that in latter case the Company may also have to obtain the permission of the highway authority for the district.

By the common law of England, every owner whose property abuts upon a public highway is also *ipso facto* the owner of the land to the centre of the road; and this legal presumption is not to be rebutted by the fact that a fence exists between his enclosed land and his half portion of the highway—nor can it be rebutted by the fact that the half of the highway is not defined upon his conveyance, nor there shown as being included in his property.

Similarly, the Post Office authorities are liable to pay for every attachment, wire, or pole, upon private property, whether used for telegraphic or telephonic purposes, but the Telegraph Act of 1863 (26 and 27, Vict., c.112) makes an important exception in favour of the Postmaster-General.

> Section 6 of that Act authorises the Post Office (as successors of the various Telegraph Companies previously constituted by Acts of Parliament)—
>
> (1) "To place and maintain a telegraph under any street or public road, and to alter or remove the same."
>
> (2) "To place and maintain a telegraph over, along, or across any street or public road, and place and maintain posts in or upon any street or public road, and to alter or remove the same."

Section 9 of the same Act provides that the consent of the bodies having the control of the streets, must first be obtained in all towns having more than 30,000 inhabitants, and Section 12 provides for the consent of the highway authority in country districts.

Section 12 also prohibits the placing of "any work above ground" through or by the side of any park or pleasure grounds, or on the private drive to a mansion, etc.

Section 22 prohibits the placing of any telegraph post within 10 yards of a dwelling house without the consent of the occupier, and there are various safeguarding clauses in the Act.

It should be remembered that these statutory powers belong solely to the Post Office, and do not apply to the works of any private person or to those of a limited company. The Telephone Companies have no statutory powers to compel owners or occupiers to allow them to enter upon their premises at all, and they must therefore make a bargain with the landowner and take a wayleave, if he is willing to grant it, with regard to every separate property they cross.

In view of the imminent absorption of the telephones into the Post Office system, it is incumbent upon every owner of real estate to take care that every telephone pole upon his land is paid for, and that the companies do not place any future works upon his property without entering into a proper wayleave agreement, and paying a fair rental for the privilege. These wayleave rentals should be payable in advance annually.

The Royal Sanitary Institute has just elected twelve new members and thirty-one new associates.

* * *

"The Gloucester Diary" for 1909, published for the Gloucester Railway Carriage and Wagon Company, Ltd., by F. J. Brooke, Gloucester, and now in its fourteenth year of issue, contains more than a hundred illustrations of the very various types of rolling stock for which the company is famous the world over. Contractors' plant, tip wagons, trollies, etc., of every description, are manufactured by the company.

* * *

A General Council for the National Registration of Plumbers, to whom the Plumbers' Company have now handed over the management of the movement, has been formed. This Council will consist of representatives of local councils existing and to be formed in numerous centres throughout the country, of delegates from the recognised associations of master and operative plumbers, together with nominees of the Plumbers' Company, of the Royal Institute of British Architects, the Incorporated Society of Medical Officers of Health, the Association of Water Engineers, the Incorporated Association of Municipal and County Engineers, and the Association of Technical Institutions. The council will meet annually in various centres. The immediate object of the General Council is to demonstrate to the public, as well as to the various parties more intimately associated with the execution of sanitary work, that the movement has for its basis the promotion of public health, and not the protection of a trade as such. The address of the General Council for the National Registration of Plumbers is 54, Parliament Street, Westminster, S.W.

THE BRICK AND TILE TRADES.

There are not wanting signs of a much larger demand for all kinds of bricks in the New Year. A number of schemes are already passed for the erection of Technical Schools; the Science and Art Schools are now recognised as a necessity for the advancement of our commerce, and many such institutions are about to be erected. Thanks to Mr. Carnegie Free Libraries are in the ascendant, and both the builders and brickmakers owe him a debt of gratitude. Public elementary and secondary schools, too, will have to be built, and a large sum of money will be expended in this way in the near future. Increasing activity among the various religious bodies has led to a number of schemes for new churches and chapels, and this should be a source of satisfaction to the building and brick industries.

All these buildings will give impetus to the making of paving quarries; floor tiles, both plain and ornamental, and roofing tiles of all patterns and colours should find an improving market.

The Local Government Board, with a view to decreasing the number of unemployed, has decided to facilitate the granting of loans to public bodies for various works; and the local authorities are responding to this stimulus from Parliament Street. Factory building schemes are likely to be advanced in consequence of the new patent laws. There is some talk of another Building Trades Exhibition in Birmingham this year; the general opinion is that it would be injudicious, and is hardly necessary. The expense to exhibitors is heavy, and the great Building Exhibition at Olympia in April must not be forgotten. These exhibitions are highly beneficial, as they disclose to builders and contractors a wider circle of manufacturers from which they can draw their supplies. The Tipton firms are making a new purple brick for churches, chapels, libraries, etc., and for such purposes they are viewed with favour by Birmingham and Midland architects. Railway engineers require in their works strength and lasting qualities, and they have been benefactors to the brick trade. A movement is on foot to form a National Federation of Clayworkers. Such a body would aim at uniformity in process and quality, and better management of brick works. Many improved kilns and other modern methods are being dealt with already, and many of the oldest brick makers are putting their works in order, showing that they have hopes of better trade. There are a large number of District Associations, and one of those, the South Staffordshire Blue Brick Association, has recently issued the following general ruling prices at the works (per 1,000 in all cases), viz.:—

Blue Brindles, 23s. to 25s.
Common Blue Wire Cuts, 25s. to 27s. 6d.
Common Blue on Edge, 30s. to 32s. 6d.
Blue Wire Cut Pavings, size 10 by 5 by 2, 30s. to 35s.
Best Pressed Blue Pavings, 10 by 5 by 2, 40s. to 45s.
Best Blue Stocks, 9 by 4½ by 3, 42s. 6d. to 47s. 6d.
Best Blue Stable Bricks (all patterns), 42s. 6d. to 47s. 6d.
Best Blue Bullnose and Splays, 47s. 6d. to 52s. 6d.

All subject to monthly accounts, and strictly nett. Discounts in the trade are now obsolete, prices not permitting them. Of course, as regards these circulated figures, some little freedom is allowed where makers are less successful in their productions, and as regards red bricks, they are sold for as much as they will command, and a fixed list is not possible at present. In large contracts the contractors' buyers purchase pretty much at their own figures.

An illustrated and descriptive calendar, showing the progress of Winnipeg, Canada, from 1870 to 1908, has been received from Mr. Charles F. Roland, Commissioner for that city.

HOW TO FELL A TALL CHIMNEY.

By Herbert C. T. Kemp.

The usual plan of felling tall chimneys is to underpin a portion of the base of the chimney with a number of stout props of timber, about 5ft. long, and then, with a ton of coal, a quantity of solid pitch, two barrels of paraffin, and some shavings, a bonfire was made, and was lit and fed in such a manner that the props would be consumed simultaneously, and with their removal the chimney stack would fall by its own weight in a comparatively circumscribed area. Altogether this was a matter requiring no little skill and experience on the part of the operator in the management of the fire, in order that the whole of the props might collapse at the same moment and allow the chimney to settle on the spot where the base has rested. This is the end to be attained; but it is now claimed that better results can be obtained without lighting a huge bonfire.

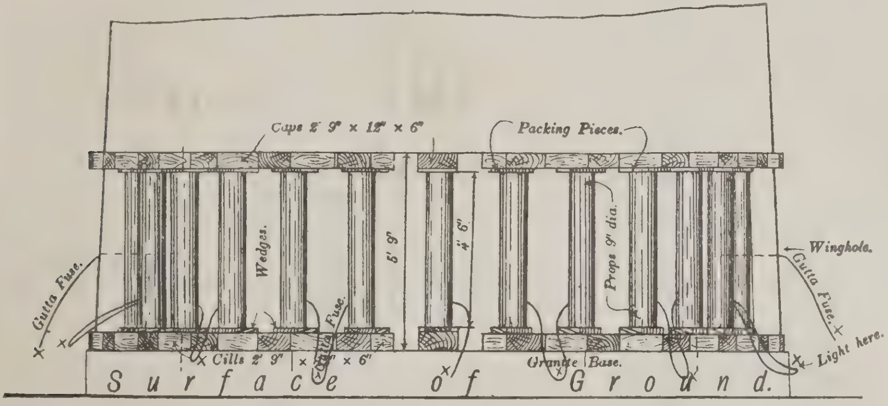
The newer method received ample justification when the Bleachfield chimney stack, on the outskirts of Aberdeen, was felled. Built in the year 1846, and rising to a height of 242ft., it was a well-known landmark. It was erected, we are informed, by a bricklayer named Walker, and about 300,000 bricks were employed, representing a total weight of 1,200 tons. Some two or three years ago it was struck by lightning and repaired, but its demolition became necessary owing to rapid decay having set in consequently on the closing of the works and the stoppage of the fires.

CUTTING AWAY THE BRICKWORK FOR THE STRUTS.

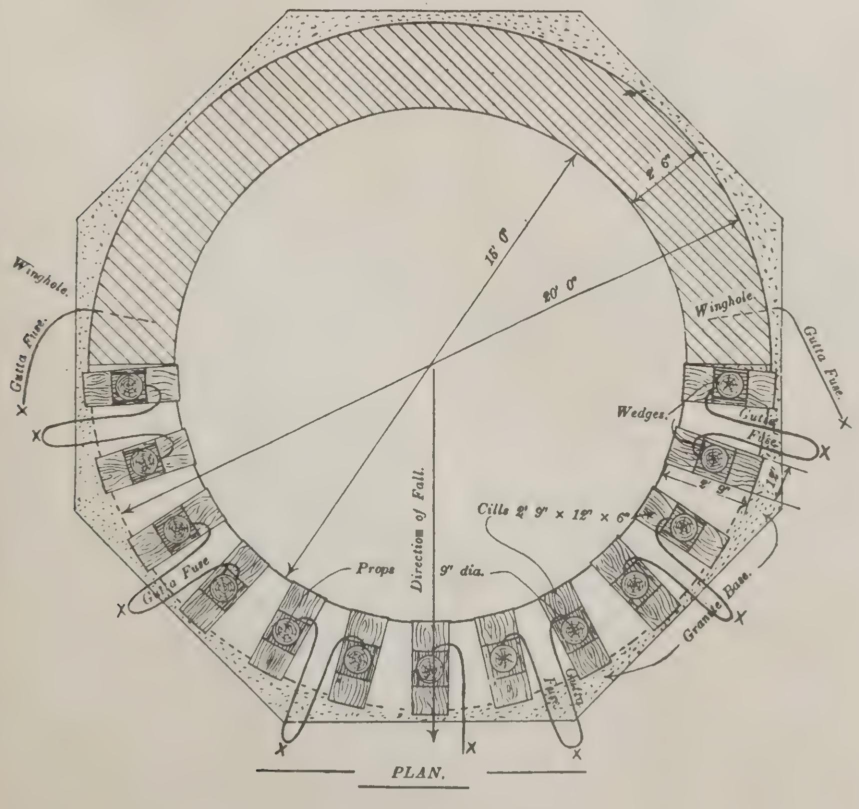
The contract for the felling of the chimney was given to Mr. P. Tawse, of Aberdeen, who has carried out several similar operations, and the work of demolition was carefully supervised by Mr. N. D. Ironside, of Messrs. Walker and Duncan, civil engineers, acting on behalf of the Aberdeen Land Association, on whose property the Bleachfield Works stood. By the courtesy of Mr. Tawse we are enabled to show the accompanying illustrations.

From the ground plan it will be seen that exactly half of the base of the chimney was cut away. The brickwork rested on a strong stone foundation, and therefore there was no fear that the weight of the chimney would cause the props to sink and cause the chimney to fall by its own weight before its time. The fuses were arranged so that the centre one exploded first, and the others in pairs, and last of all the wingholes.

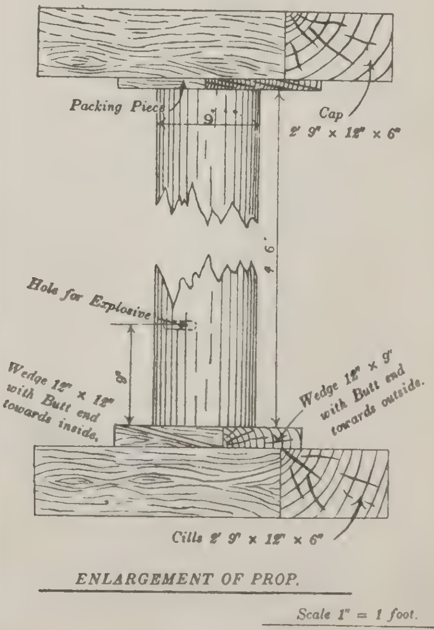
The demolition took place on July 17th, 1908, in the presence of, it is said, 30,000 spectators, who were kept at a safe distance by the police.



ELEVATION.



PLAN.


Packing Piece
9"
Cap
2' 9" × 12" × 6"
4' 6"
Hole for Explosive
8"
Wedge 12" × 12" with Butt end towards inside.
Wedge 12" × 9" with Butt end towards outside.
Cills 2' 9" × 12" × 6"

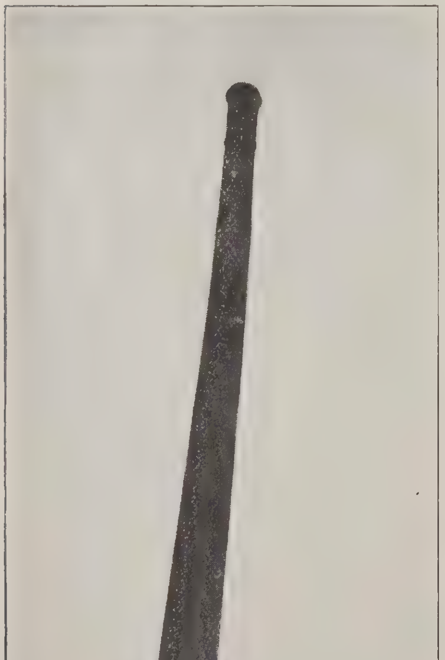
ENLARGEMENT OF PROP.

Scale 1" = 1 foot.

NOTE.—Lighting spots marked X

THE CHIMNEY BASE READY FOR FELLING.

The workmen armed themselves with torches, and one of these was handed to Mr. Adam Maitland, chairman of the Aberdeen Land Association, who lit the first fuse and hurried from the scene. The torches were then applied to the other fuses, from which heavy smoke rose and issued from the mouth of the chimney. Two and three-quarter minutes after the fuse had been fired the first shot rang out, followed almost immediately by the other three. The props flew from beneath the brickwork, some shattered—others not. The summit was seen to sway slightly, the result of the back kick of the explosions. Gradually, however it leaned towards the west, and, slowly gaining momentum, appeared as if it was to fall full length on the ground. The strain, however, was evidently too much for the storm-battered structure, and it was seen to fracture almost in the centre. At the same time an explosion burst the base, and the top portion telescoped. The other portions cracked and split, and, amid the explosion of the remaining charges the shaft crumbled away. Huge clouds of dust rose from the debris, and for a time obscured the wrecked chimney from view, but it rapidly cleared away, and it was seen that the immense quantity of masonry had fallen within a very limited area. The operations had been in every way successful. From the time the top was seen to move until the whole erection was on the ground 9 4-5 seconds elapsed. The workmen cautiously approached the great mass of brick and mortar fearing the presence of some unfired explosive. All the charges had done their work, however.



THE CHIMNEY AT THE MOMENT OF THE EXPLOSION.

THE CHIMNEY IN THE ACT OF FALLING.

The accompanying illustrations, which have been reproduced from photographs by Mr. H. J. Kennie, of Aberdeen, show various interesting stages in the operation.

IRON ROOFS.

By T. McGill.

Concluded from page 465, No. 722.)

In Special Cases

where extra wide spacing of bracing is necessary owing to obstructions under the roof, the sheets must be supported between the bracings by angle-steel purlins, and the sections of the bracings as given in the previous table slightly increased. For a spacing between bracings up to about 12ft., centre to centre, $1\frac{3}{4}$ins. by $1\frac{3}{4}$ ins. by $\frac{1}{4}$in. L purlins should be used; and for all spacings above 12ft. and up to about 15ft., centre to centre, which is the maximum that should be used, 2ins. by 2ins. by $\frac{1}{4}$in. L purlins are sufficient. These purlins are connected to the sheets at the points where the bracing bars are fixed, either by galvanised hook-bolts, square nuts, and corrugated washers, as shown in Fig. 10, or by means of light flat iron clips, passing round the purlin and bolted to the sheets by small galvanised snap-headed bolts, square nuts, and small round washers, as in Fig. 11, and spaced about intervals of about 15ins. centres for the full length of the roof. The number of purlins for the various spans is as follows:—One line of purlins up to and including 20ft. span; two lines of purlins up to and including 24ft. span; three lines of purlins up to and including 30ft. span. The method of fixing bracing bars to the purlins, which also forms a splice for the purlin itself, is shown in Figs. 12 and 13. The sections of the bracings as given in the previous table will be sufficient for all spacings up to 12ft., but, above this, the sections should be as given in Table No. 2.

Particulars of the Galvanised Sheeting.

The most important factor in roofs of this type is undoubtedly the galvanised corrugated iron sheeting, as it is so liable to corrosion, due to the acids and moisture in the atmosphere, but if sheets of good quality are obtained, they should last from about ten to fifteen years without requiring renewing. It should be noted that all sheets should be gauged before galvanising, as some makers gauge the sheets after galvanising, thus supplying a lighter gauge than specified. To check this, sheets should always be compared by their weights as well as by their gauge.

The coating of zinc should increase the weight of the sheet by from about $2\frac{1}{4}$oz. to 3oz. per sq. ft.; and if gauged after galvanising, they should measure one or two gauges larger than the original gauge, so that No. 22 sheets would gauge about No. 20 over the galvanising, and sheets No. 24 would gauge about No. 22, and so on.

Details of Sheeting.

The gauge of the sheets to be used in the various spans is given in Table No. 1. These are usually sheets of 10/3ll corrugations, each covering 2ft. 6ins. in width when laid with one corrupation side lap, and 2ft. 3ins. in width when laid with double corrugation side lap, as shown in Figs. 14 and 15, respectively; the latter only being used where the roof is in an exposed position, subject to high winds, or where a special water-tight roof is necessary; although it is perhaps advisable to give the sheets a double side lap in all spans above, say, 25ft. The end lap of the sheets should never be less than 6ins.; and in the larger spans, or

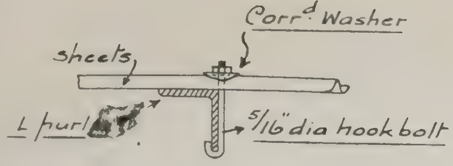


Fig 10

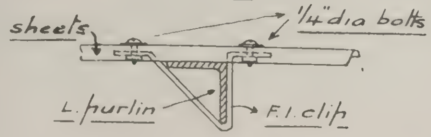


Fig 11

Table of Scantlings No 2

span in feet	Type	Bracings			
		A	B	C	D
10 to 15	No 1	5/8" dia	3/4" dia		
16 to 20	No 1	3/4" dia	3/4" dia		
21 to 23	No 2		7/8" dia	3/4" dia	
24	No 2		7/8" dia	3/4 dia	
25 to 27	No 3		7/8" dia	3/4" dia	2"×2"×1/4" L.
28 to 30	No 3		1" dia	3/4 dia	2"×2"×1/4" L

Note:- Above scantlings for spacings of bracings above 12 feet up to and including 15 feet

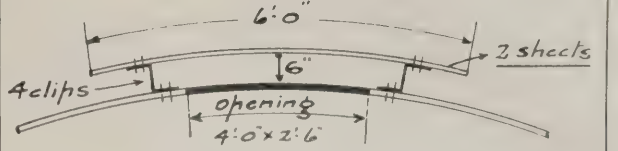


Fig 17.

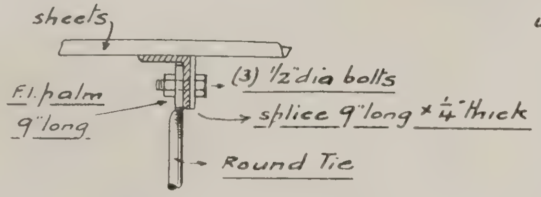


Fig 12

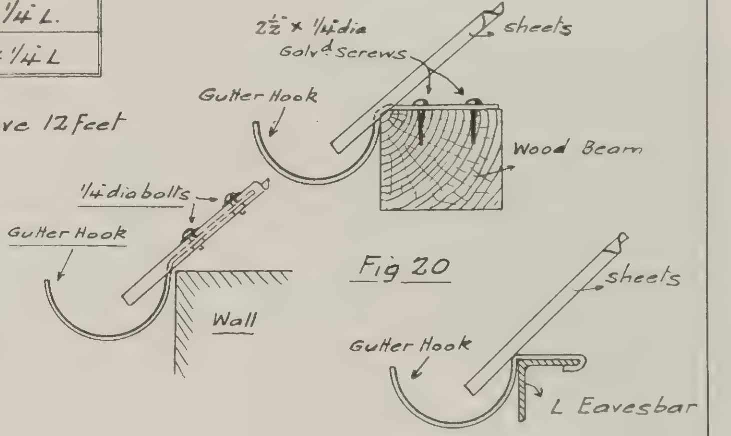
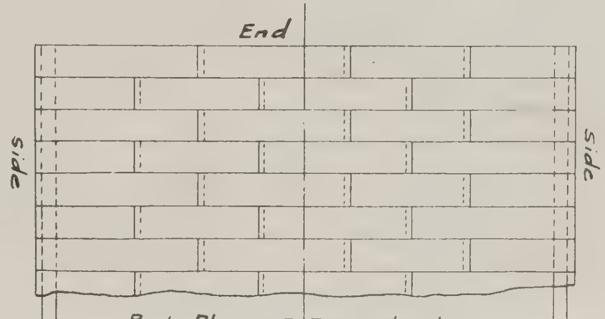


Fig 20



Part Plan of Roof sheets

Fig 16

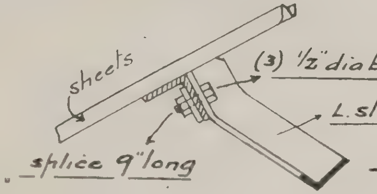


Fig 13.

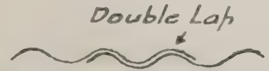


Fig 15

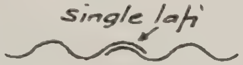


Fig 14

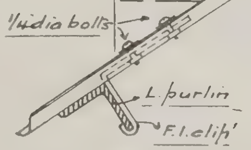


Fig 18.

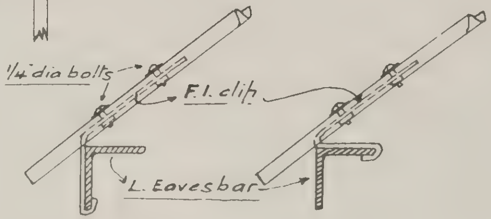


Fig 19

SELF SUPPORTING CURVED IRON ROOFS. DETAILS.

where a very flat curve is given to the roof, this should be increased to 9ins. In roofs of this type, the sheets are always arranged to break joint, or break-band as it is usually termed, thus giving the roof greater rigidity and strength. This arrangement is made by commencing with large size sheets (9ft. long being the usual maximum), and reducing to the smaller sizes in each tier, starting from alternate sides of the roof, as shown in Fig. 16. The sheets are bolted together with ¼in. diameter galvanised snap headed bolts, square nuts, and small round washers, spaced about 12ins. to 15 ins. apart up seams for single overlap, and about 7½ins. to 9ins. apart zigzag for double overlap; and one bolt to each corrugation (placed zigzag) in the end laps. A good method of keeping the roof water-tight is to place a small round washer of lead between the sheets and the iron washer of all sheeting bolts and hook-bolts. The average weights of galvanised corrugated sheeting per square (100 sq. ft.) of roof surface when laid (exclusive of end laps), and allowing for sheets with 10ft. 3ins. corrugation, will be as follows:—

Gauge.	Single laps.	Double laps.
No. 24 ...	134lbs. ...	149lbs.
No. 22 ...	167lbs. ...	185lbs.
No. 20 ...	200lbs. ...	223lbs.

The sheeting bolts and nuts, with two washers to each (one iron and one lead) for each square (100 sq. ft.) of roof surface will be as follows:—For single corrugation side laps=½ gross and weight=4lb.; for double corrugation side laps=¾ gross and weight=6lb. All galvanised corrugated sheets to be free from acid spots, blisters, cracks, and defects of every kind, and should be perfectly square on the edges.

A Simple Form of Ventilator

for this type of roof is shown in Fig. 17, and is formed by leaving out a short portion of a sheet in one of the tiers at the crown of the roof, and covering the opening with two sheets, supported on light flat iron Z-shaped clips, which are fixed to the sheets with small galvanised bolts and nuts. When the sheets are fixed at the eaves to a timber eaves beam, the latter is chamfered about 1in. wide at the outer edge to form a bearing for the sheets, and the sheets are fixed to same with 2½in. long by 5-16in. diameter coachscrews and corrugated washers, spaced 9ins. apart, or at every third corrugation in the smaller spans. For the larger spans, 3ins. long by 5-16in. diameter coachscrews and corrugated washers should be used and spaced at 6ins. apart, or at every second corrugation (see Fig. 8). It should be observed that all screws and bolts and nuts are placed at the apex of the corrugations, and not in the valleys. In the case of a roof on walls, the sheets are fixed at the eaves to an angle steel purlin bar, which may be 2½ by 2½ by ¼ L section for 10ft. spacings of bracings, and 3 by 3 by ¼ L for 12ft. and 15ft. spacings. The sheets are fixed to this purlin by means of light iron clips, with two small galvanised bolts, nuts, and washers to each, the clips being spaced about 15ins. apart for the full length of the roof (as shown in Fig. 18); and a similar fixing is made in the case of a roof on steel stanchions; but as the sheets usually rest on the heel of the angle bar, clips as shown in Fig. 19 are used, these being spaced alternately at 15ins. apart centres for the full length of the roof.

Gutters and Downpipes

for this type of roofing are usually made of galvanised sheet-iron. The gutters are of half-round section, and may be No. 20 gauge thick for the smaller spans, and No. 18 gauge for the larger spans, the downpipes being Nos. 24 and 22 gauge, respectively. For spans up to 18ft. 4½ins. wide gutters, with 2½ins. diameter downpipes, may be used; for spans from 18ft. up to and including 25ft., the gutters may be 5ins. wide, with 3ins. diameter downpipes; and for all spans above 25ft., the gutters should be 6ins. wide, and have downpipes 3ins. diameter. A good rule for determining the sizes of gutters and downpipes is as follows:—Downpipes should have a bore or internal area of at least one sq. in. for every 80 sq. ft. of roof surface in temperate climates, and about 40 sq. ft. in tropical climates. They should be spaced from about 30ft. to 40ft. apart, and should have gutters about twice the diameter of the pipe in width. Gutters should have a fall of at least 1in. in 15ft.=1 in 180, and are supported by light iron straps, or hooks, spaced about 3ft. apart, bolted to the sheets, screwed to the timber eavesbeam, or hooked to the eavesbar, as shown in Fig. 20, the downpipes being fixed at intervals of about 6ft. with the ordinary types of holdfasts. Sections and particulars of larger spans might have been given, but the writer does not recommend this type of roof for spans much exceeding 30ft., and has therefore made this the limit. No theoretical calculations have been given, as this type of roof is designed entirely for practical experience, and on this account it is hoped that the foregoing particulars will prove beneficial to those interested in light iron roofing work.

Law Case.

A Quantity Surveyor's Claim.

The case of Bramall v. Gowing was heard before Judge Ruegg, K.C., in the Birmingham County Court on the 4th inst. It was a claim by W. H. Bramall, quantity surveyor, of Manchester, formerly of Coventry, against F. Gowing, builder, of Birmingham, for damages for breach of contract, or alternatively for wrongful dismissal. The defendant was contractor for the erection of a new factory in Coventry, for Humber, Ltd. He engaged plaintiff at a salary of £3 15s. per week during the progress of the works to measure up the work done and adjust the measurement with the architect. The defendants' case went to prove that the plaintiff's measurements were inaccurate, that he had omitted a whole floor, 3,700 yards in extent, and that after Mr. Dix, the architect to Humber, Ltd., had informed defendant that there were a lot of items against him, plaintiff was requested to meet Mr. Dix to go into these matters, and, refusing, was dismissed. Mr. Wiliam Iles, surveyor, employed by defendant, and Mr. Dix, surveyor to Humber, Ltd., said they checked plaintiff's figures and found them wrong. The granolithic floor was omitted, and that would have been a loss of £900. His Honour, giving judgment, said no case of dishonesty or falsification by defendant had been made out. He found plaintiff was wrongfully dismissed, and assessed damages at £25.

On the application of Mr. Maddocks, counsel for the defendant, a stay of execution for fourteen days was granted.

The Palace of Holyrood is being treated with a view to the prevention of further decay, and it is expected that the work of this character will occupy about a year. The larger question of restoration is still the subject of keen controversy.

Matters of Opinion.

No. 1 (continued).—The Increased Employment of Specialist Contractors.

We have received the following letter from the Liverpool Master Builders' Association:

Dear Sir,—The correspondence which has been appearing recently in your Journal on the above subject has received the consideration of the Council of this Association, and I have been requested to lay some views of the members of this Association before you.

It is a fact beyond doubt that the above heading, with special emphasis on the first words, indicates the present position of this question, and this increasing custom is inflicting great hardship on the general building contractors for the following reasons:—

The general building contractor has to:

(a) Bear the responsibility of the work;
(b) Cut out, attend on, and make good after;
(c) Provide scaffolding;
(d) Pay carriage on goods, also on return crates, etc.;
(e) Bear the responsibility for the storage, safe keeping and good condition of all the goods bought by the architect from so-called "Manufacturing Specialists";
(f) Pay all accounts relating to the above;
(g) Bear responsibility for delays.

For these items and many others the general building contractor in most cases receives absolutely no remuneration.

It is admitted that the general building contractor has in the majority of cases the option of adding profit and a certain sum for attendance on specialists, but this option is very seldom taken advantage of by the builder, because he is working entirely in the dark as to what is the proper amount to include. On the other hand, the architects are in a position to know what the cost of attendance on such specialists is likely to be, and if they insist in continuing to employ specialists in the way they do now, they ought to include in the prime cost sums a sufficient amount, not only to pay for the specialists, but also to pay the general building contractor a reasonably assured profit on the work relating to each specialist. This is the only feasible solution with fairness to the general building contractor, if he is to be responsible for the specialists' work.

If, however, architects will not agree to this equitable way of dealing with the growing injustice referred to, there is only one other reasonable course in the general building contractors' interests, open to them, and that is to exclude all lump sums in the quantities for specialists, and omit all clauses in the contract relating to specialists, and for the architect to let this work direct and issue certificates—in a few words, the general building contractor to have nothing to do with the specialist at all.

Yours faithfully,
BERTRAM B. MOSS,
Secretary

Sir,—In your issue of the 9th ultimo, you publish an opinion on this question from the Bury and District Master Builders' Association, who states, in a concluding paragraph, that the "question of proper quantities often enough puzzles the builder," and who gives examples of items which are, presumably, extracted from a bill of quantities issued in the north of England. The system of taking off quantities in the north varies somewhat from the method adopted in London and its vicinity, and those who favour the latter, claim that their bills are prepared much more in detail than the ones supplied by their provincial brethren. There are many competent and reliable quantity surveyors practising in the north whose work, however, is fully equal to that of many leading surveyors in London, and no bill of quantities issued by one of these gentlemen would contain items such as those quoted by the Bury Association, viz. :—

"No. 1.—Tracery windows to detail complete;

"No. 1.—Oak entrance door with frame casings, lock or complete."

The inclusion of items such as these afford ample evidence that the person by whom these bills were prepared is utterly lacking in training, and has failed to grasp the primary object to be attained in the preparation of bills of quantities, i.e., the production of a document embracing a record of all the material and labour required in the erection of a building, and in which the items should be sufficiently clearly described so that an estimator may price the set without referring to the drawings.

The bills of quantities of which your correspondents complain are certainly not prepared by a quantity surveyor, and this fact seems to point to the necessity for the increased employment of the specialist in quantity surveying. If all the leading contractors in one district were to refuse to tender for work for which quantities accurately prepared were not supplied, the irresponsible and incompetent surveyor would cease to exist.

ARTHUR G. CROSS, F.S.I.
Caxton House, S.W., Jan. 2nd, 1909.

Views and Reviews.

Old Essex Buildings.

Although the architectural interest of these "Memorials of Old Essex" does not predominate, it is by no means insignificant. There are chapters, by various hands, on the ancient churches, the monumental brasses, and the historic houses in the country; and the many illustrations include several interesting churches, such as Greenstead, which is remarkable as containing the only remaining wooden-walled nave of Saxon type; Ashingdon, with its conical-roofed Saxon tower; and South Ockenden, with its remarkable round tower. Red brick towers, it is observed by Mr. T. M. Grose Lloyd, who writes the extremely interesting account of the "Ancient Churches of Essex," are a unique characteristic of the county. These brick towers, and the timber towers and turrets, are the most characteristic features of its churches. The wood towers and turrets are often covered with shingles, a term that the author rather quaintly defines as "tiles of cleft oak," a kind of roof-covering that nowadays is much more common in America than it is in this country. The porch of Feering is vaulted in brick; the tower of Sandon is domed over in brick, and Chignal Smealy is built entirely of brick, even to the font. Also the churches are apt to be lop-sided. About half of them were built without aisles, and there are now more north than south aisles. The towers are commonly at the west end, and project from the nave, only a few of the cruciform churches having central towers. The county may be said to be extraordinarily rich in Norman churches, Waltham Abbey being, of course, incomparably the most notable example. A spirited drawing of the nave pillars of the Abbey, contributed by Miss Jessie Godman, is perhaps the best illustration in a book that in this respect is uncommonly well supplied. Altogether, this is a fascinating volume—the kind of book which we are inclined to suspect the architect prefers to the more purely professional treatises. Those he must study; this he may enjoy.

Memorials of Old Essex. Edited by A. Clifton Kelway, F.R.Hist.S. With many illustrations. London: Bemrose and Sons, Ltd., 4, Snow Hill, E.C., and Derby.

Bridge Construction Problems.

The aim of the present book is "to furnish easily understood rules whereby problems connected with bridge construction may be treated analytically and graphically," the need of such a book having been felt by the author in his capacity of lecturer on civil engineering at the Swansea Technical College. After defining terms employed, the author deals with stresses in beams and in framed structures, cantilever bridges, moment of inertia, etc., strength and fatigue of timber, iron and steel, strength of columns, riveted joints, etc., deflections of beams, continuous girders, loads on bridges, arches, suspension bridges, draw bridges, travelling bridges, floors of bridges are next considered in detail; and the book concludes with the calculations in typical bridges. The work is well printed and clearly illustrated, although some of the figures suffer rather from severe reduction.

The book is one which should prove of considerable use to engineers engaged in bridge design; it is, however, more of a treatise than a text-book, and would not, we think, be of so much value to students of constructional engineering because most of the theory is not explained at length. For instance, although in the chapters on framed structures many reciprocal diagrams are shown, and many cases are worked by the method of moments or sections, there appears to be no description of such diagrams or method, nor do they appear to be referred to as such.

We think that the book would be much improved if more references to other works were given where the principles of the rules used are set out at length, and if distinction were drawn between rules which are theoretically accurate and those which are only approximate. On page 29, for example, we note the rule that : "To determine the equivalent centre load in the case of a beam loaded symmetrically or unsymmetrically at different points, multiply each load by twice its distance from the nearest point of support, sum the products and divide by the span." This rule is not accurate, but only approximate, and would rather perplex the reader who tried to see the principle involved in it

The question of rolling loads does not appear to be very clearly dealt with; in some of the examples the axle-loads are given, but it is not clear that they are really used.

The chapter on arches is a good one, and should be of considerable assistance, especially as the British textbooks do not deal very much with this subject.

There are in the book a large number of detail drawings and descriptions of and calculations for typical bridges in timber and steel which are of considerable value and interest, and which must have taken much patient labour to collect. We think that the book is a useful addition to the literature on bridge design; many of the largest and best previous books on the subject have been of American origin, and the difference in the practice and technical terms between the two countries has lessened their value in this country.

The preface informs the reader of the very sad circumstances under which the book was produced, the author living only just long enough to complete a work that had taken eight or nine years to prepare.

The Theory and Practice of Bridge Construction, by Morgan W. Davies, A.M.I.C.E.; 594 pages. 12s. nett. (Macmilan and Co., Ltd., London.)

A premature announcement in the press to the effect that the Shakespeare Memorial Committee had decided in favour of a scheme for the establishment of a national theatre has been contradicted by Mr. Philip Carr, the secretary of the Committee, who, writing on January 7th, stated that "no meeting of the General Committee has yet been held to consider the details of a scheme, and that consequently no scheme can be said to have been adopted."

Federation News.

Oldham Master Builders' Association.

A deputation from the Master Builders' Association and the Trades Council appeared before the Oldham General Purposes Committee last week to discuss a new Fair Contracts Clause which the Trades Council had promoted. The clause, in addition to asking that contractors shall pay standard wages and observe the usual conditions of labour in the district urged that contractors shall not sub-let a contract without consent of the Council and in connection with an sub-contract, shall be held responsible for the observance of the various conditions as though the contract was being carried out by themselves. The clause also asked that contractors and sub-contractors shall recognise the absolute freedom of the workpeople to be members of trade unions, and that a breach of conditions shall render a contractor liable to lose his work or a penalty not exceeding £500.

Mr. J. R. Clynes, M.P., who supported the clause, said no fair employer need be afraid of it, while Mr. S. Smethurst, of the Master Builders' Association, said if the Trades Council became too exacting employers would have to retaliate. The committee decided to further consider the clause.

Proposed New Works.

Belfast.—Mr. W. J. Fennell, F.R.I.B.A., of Belfast, is preparing plans for new schools for the vestry of All Saints' Parish.

Birkenhead.—The ratepayers of South End are petitioning the Corporation for the erection of public salt-water baths.

Bishopstoke, Hants.—A proposal to erect here a church tower in memory of the late Admiral Keppel is receiving encouraging support.

Bournemouth.—The Town Council has agreed to a scheme for the erection of a Kursaal, costing £45,000, on the Bellevue site, near the pier approach.

Cahirciveen, Ireland.—Mr. R. M. Butler, architect, Dublin, is preparing plans for a new free library here.

Cirencester.—The U.D. Council have approved plans for the following: Additions to house in Dyer Street, for Mr. C. Baldwin; additions to house in Victoria Road, for Mr. E. L. Weskett; office in Ashcroft Road, for Mrs. Avery; additions to tramp ward at the workhouse; alterations and additions to house in Cecily Hill for Mr. W. H. Saunders; and shop, etc., in Black Jack Street, for Earl Bathurst.

Coventry.—The Town Council are contemplating the erection of new municipal offices and are at present looking for a suitable site.

Dublin.—The Committee of Management of the Richmond District Lunatic Asylum have applied to the Local Government Board for a loan of £54,720, for extensions and alterations to the Dublin and Portrane Asylums.

Eastbourne.—The Town Council have approved plans for the following :—D. E. Williamson (Spalding, Spalding, and Myers, architects), additions to York House, Royal Parade. A. Max Wilkinson (C. Breach, builder), addition to Warren Hill. A. W. Cheetham, detached house, Baslow Road. Vicar and Wardens of Holy Trinity Church (A. R. G. Fenning, F.R.I.B.A., architect), alteration and addition to Holy Trinity Church. A. E. Potter (Mitchell and Ford, architects, A. E. Potter, builder), ten houses, Desmond Road. Beach Laundry Co. (J. D. Thompson, builder), addition to the Beach Laundry, Royal Parade, East. A. de Mierre (F. G. Cooke, architect, B. Stevens, builder), detached house, Ashburnham Road.

Eccles.—The L.G. Board have agreed to the erection, by the Corporation, of 12 artisans' dwellings in Corporation Road.

Huddersfield.—An extension of the General Post Office is in contemplation and the Treasury have secured a site in Northumberland Street for the erection of a new building, which will be used for the general postal business. The present buildings will then be devoted to the telegraph and telephone services.

Lanchester (Durham).—The Durham County Education Committee have passed plans for new elementary schools at Langley Park, and Blomfontein, Craghead.

Madrid.—The Bishop of Gibraltar is appealing for funds for the erection of an English church at Madrid. About £3,000 is required.

Mexborough.—The Education Committee have in hand a scheme for a new secondary school to accommodate 360 scholars. Plans have been submitted by Mr. Stewart, of the county architect's office, Wakefield.

Perth.—The directors of the City and County of Perth Royal Infirmary have resolved to proceed with the erection of a new infirmary on a site at Tullylumb. The infirmary is to contain 100 beds, at an estimated cost of £400 a bed.

Portadown, Ireland.—Mr. J. W. Walby, architect, of Portadown, has been instructed to prepare plans for a new dispensary, at a cost of £1,000.

Prestwick.—A new sea wall is to be erected here at a cost of £5,000. Mr. William Cowie, architect of Ayr, has prepared the plans.

Royton, Oldham.—A proposal is on foot to rebuild the Church Institute, at a cost of £2,000, on a new site, which has already been purchased.

Shanklin, Isle of Wight.—It is proposed to erect a kursaal with marine gardens at Shanklin, plans for which have been prepared by Messrs. Frank Matcham and Company, of London, and approved. The kursaal is to be erected on a leasehold site on the esplanade, the auditorium to have a seating accommodation of 650, and stage accommodation large enough for any of the first-class London touring companies. There will be reading, smoking and other rooms, with a balcony on the sea front overlooking the English Channel. A high-class club will be formed for residents and visitors, and the adjoining grounds will be laid out as ornamental gardens, with tennis and croquet lawns and bowling greens.

Stockport.—Improvements to the General Post Office are contemplated, and the Town Council has intimated to the postal authorities that if they will carry out a widening improvement and erect a new post office, the Council will present them with a site for the new buildings.

Tulsk, Ireland.—Tenders have been received for new R.C. Schools.

Tuxford, Notts.—A committee of Sheffield City Council that has in hand the matter of providing a sanatorium for the treatment of consumptive patients, has recommended a site at Tuxford, Notts. The site is about 34 acres in extent.

Wicklow.—Tenders are to be invited for new schools here, plans having been approved by the National Board of Education.

Wigan.—The Parish Church tower, which has been effected by the coal smoke, has been the subject of a long report by Mr. W. D. Caröe, F.R.I.B.A., F.S.A. Mr. Caröe proposes to treat the stonework with chemicals at a cost of £650, a sum of £25 to £50 to be used for preliminary experiments in treatment.

Yardley.—Mr. A. G. Drury, Local Government Board inspector, has held an inquiry relative to an application by Yardley Rural District Council for leave to borrow £2,240 for works of sewerage in Stechford, £325 for purchase of land to be used as a depot, and £6,718 for recreation ground purposes.

Works in Progress.

Bacup.—The town of Bacup is committed to a considerable number of important enterprises. The waterworks scheme, nearing completion, has already cost £230,000. The Bacup steam tramways are to be electrified at a cost of £10,000, and the road from Bacup to Waterfoot is to be reconstructed at a cost of £24,000. A new elementary school is to be erected in Burnley Road, costing £7,000, and the river is to be arched over and a new post office built. Application has also been made by Bacup, jointly with Rawtenstall, for power to borrow £26,000 for a new technical institute, to be erected centrally at Waterfoot. In addition, 100 residences are to be erected on the garden city principle on the Esther estate, and the Ross Spinning Mill, which is now roofed in, is to hold 130,000 spindles ultimately, and give employment to 600 hands. Such a combination of enterprises is unprecedented in the history of Rossendale.

Burton.—A start has been made on a new Roman Catholic school in Guild Street, and work has also begun on the new police station and courts, on which it is likely that fifty men will find employment.

Burton-on-Trent.—Some important business premises have been completed in Market Square from the designs of Mr. Fourshaw. The new buildings have facings of red brick with Hollington stone dressings and "Edwardian" chimney pots have been used. The steelwork engineers were Messrs. Mark Fawcett and Co., and the "Fawcett" fire-resisting floor is used throughout.

Capetown. — Four stained glass windows, designed and painted by Messrs. Karl Parsons and C. W. Whall, of London, and executed by Messrs. Lowndes and Drury, of Fulham, London, have been placed in windows in the apse of St. George's Cathedral.

Clatford.—The ancient church tower at Upper Clatford has been restored. The last restoration of the tower was about the Stuart period, as proved by the discovery of an old stone with an inscription embedded in the wall in the belfry. A thirteenth century pillar piscina was also discovered. In the Stuart restoration it had probably been removed from the interior of the church, and was broken in halves to form the sides of a window, presumably for purposes of economy. The wish of those who hoped the tower would not be improved out of knowledge has been respected, for while the work has been thoroughly done, the only important change has been the scraping off of the plaster, exposing the original flint surface.

Denbighshire. — The education authority have opened during last week four new Council schools in the Eastern portion of the county, and one in the Western portion. Two others will be ready for opening during the month, making a total of seven new council schools from the designs and under the supervision of their county architect. Mr. Walter D. Wiles, one of which is on the Central Hall, and the others on the corridor principle; these new schools have been built in single school areas, mainly by the aid of the McKenna Government grant.

Deptford, S.E.—The new bridge over the Grand Surrey Canal, at Trundleys Road, which has just been opened for traffic, is 32 ft. wide, with a carriageway of 24 ft. The bridge it supersedes was only 12 ft. wide, including the footways. Messrs. Dick, Kerr and Co., are the contractors, and have built the bridge to the order of the London County Council.

Ebbw Vale.—A new Congregational chapel here, of which the foundation stone has just been laid, will seat 650, and the basement will contain a hall to seat 500. The cost is estimated at £3,364. Mr. T. Roderick, of Aberdare, is the architect, and Messrs. S. T. Davies and Son, of Ebbw Vale, are the builders.

Gateshead.—For the new wing of the Gateshead Children's Hospital, opened on Dec. 16th, Messrs. Watson and Scott, of Newcastle, are the architects, and Messrs. Raven and Hitcham, of Gateshead, are the general contractors.

Glasgow.—A new clubhouse for the Old Kilpatrick Conservative Association, in Klbowie Road, Clydebank, includes a hall capable of seating 300 persons, and has cost, altogether, about £2,000. Mr. D. Andrew, junior of Glasgow, is the architect. There is a shop on each side of the front entrance.

Hampstead.—The lowest of thirty-five tenders has just been accepted for the erection of a temporary church at Golder's Green. The total cost will be about £2,000. Mr. Herbert Wills, of Wills and Anderson, is the architect.

Hampstead, London, N.W.—The Central Library extension at Finchley Road was opened by the Mayor of Hampstead on Jan. 1. The facade of the new wing corresponds with the original work. The lower floor will be used as a Children's Lending Library, and has a separate entrance from Arkwright Road. On the floor over is a committee room. An iron staircase in this committee room leads to two new store rooms over the entrance corridor. The store room which formerly served as a committee room is now divided into a book store and a new staff room, the space of the former staff room being added to the Lending Library. The buildings have been designed by Mr. Arnold S. Tayler, A.R.I.B.A., of Old Queen Street, Westminster, and carried out by Mr. H. L. Holloway, of Deptford, Mr. E. L. Cooper acting as clerk of the works.

Handsworth.—The new King Edward's Grammar School for Girls, upon which work is about to be commenced, is to be built of brick, with stone facings, and is estimated to cost more than £30,000.

Isle of Man.—The Tynwald Court Committee have accepted the tender of Mr. R. F. Douglas for the erection of the new Government buildings and deed rooms. The new buildings include, beside the new Rolls Office, an addition to the Keys Chamber, to provide accommodation for the Press, lavatories, etc., and new accommodation for the Speaker. The designs have been prepared by Mr. H. Cowle, the Government architect.

London, E.C.—Further repairs to the west front of St. Paul's Cathedral have been put in hand, the cornice of the great west door being the immediate work under reparation. Mr. Mervyn E. Macartney, F.R.I.B.A., F.S.A., is the architect to the Dean and Chapter.

London, W.C.—The contract for the British Museum Extension in Montague Street has been let to Mr. W. E. Blake, of Plymouth, for £118,000. The new building is to have a plinth of polished Scotch granite,while the upper part will be of Portland stone. All the joinery work, etc., will be made in Plymouth. Mr. J. J. Burnet, A.R.S.A., F.R.I.B.A., of Glasgow, is the architect.

Morecambe.—The tower and grounds have been purchased by a London syndicate, and considerable alterations are being carried out by Messrs. Hawkins and Co., of Westminster, London.

Morley, Yorks.—A new secondary and technical school was opened here on the 4th inst. The new structure will accommodate 200, and there is room for an extension for 150 more. It is a plain but substantial building. Occupying a site of nearly three-quarters of an acre, the ground floor space includes an engineering laboratory and workshop, textile laboratory, science lecture-room manual and plumbing workshop, millinery and dressmaking room. The great feature of the first floor is a spacious assembly hall, surrounded by classrooms, etc., over which are situated a chemical laboratory, physics laboratory, lecture theatre, elementary and advanced art rooms, gymnasium, laundry, and cookery room. The total cost, including site and equipment, is £15,500. Mr. W. E. Putnam, borough engineer, was the architect.

Paddington.—The Great Western Railway is carrying out an extensive plan for the improvement of Paddington Station. Work in connection with this scheme has been in progress for some years past, and has led to the important extension on the Bishop's Road or arrival side of Paddington, which is now being worked out for contract. This will constitute the first enlargement of Paddington Station since its construction in the year 1854. Bridge renewals in the vicinity of the terminus have been in progress for a considerable time past. The various over-bridges, which have been reconstructed, are mainly on the short piece of line between the terminus and West London junction, some 2¾ miles distant. The bridges, the reconstruction of which has already been completed, are the Bishop's Road, Scrubb's Lane, Mitre, Green Lanes, Westbourne Park, and the Hampton Street foot-bridge. The various bridge reconstructions were a necessary preliminary to the rearrangement of the approach lines to the terminus. The work which is to be put in hand at the terminus itself includes the provision of three extra platforms and lines, an extension of the station roofing over the new road, and the construction of a new carriage road which will entail undercutting the public roadway beside the station. Some improvements have already been carried out in the traffic arrangements at Paddington Station, among these being a subway and luggage lift to five of the platforms, while the lighting of the terminus has been considerably improved by the instalment of a new form of arc lamp. The general scheme has included the transference of the locomotive and carriage depot to Old Oak Common, Acton, and the dismantled site at Westbourne Park is to be utilised as a mileage yard, the work in connection with which has now been completed. The electric lighting station, which was formerly adjacent to the terminus, has been removed to Park Royal, a step taken in conjunction with the construction of a large generating station for the supply of current for the working of the Hammersmith and City Joint Lines.

St. Austell.—A new china-clay kiln that has just been started here is 380 ft. long and 18 ft. wide, and has a shed capacity for 10,000 tons. There are six large tanks adjoining the kiln, which, when filled, contains about 8,000 tons. The stack, which has been built of Pentewan concrete blocks, is 120 ft. high. In the construction there have been used 12,000 tons of stone, 3,000 tons of sand, and more than 300 tons of cement.

South Shields.—Difficulties have arisen over the completion of the Municipal Buildings, the architect, Mr. E. E. Fetch, having ordered the contractors, Messrs. Neill and Sons, to remove certain woodwork, which he condemned. The contractors appear to have removed only part of the defective woodwork, and in one part only has the woodwork been renewed. After calling in Mr. C. J. Wade, a timber expert, of London, to report on the matter, the Council have instructed the Town Clerk to give notice to the contractors that unless the terms of the architect's order of the 1st December last are complied with within fourteen days from the receipt by them of notice, the Council will put in force the power given to them by condition 16 of the contract, viz., to employ and pay other persons to carry out the orders of the architect, and that all expenses consequent thereon and incident thereto will be charged to the contractors in accordance with the terms of such condition.

Stoke (Devonport).—The foundation stone has been laid of a higher elementary school which is being erected here at a cost of £11,180.

Sunderland.—Mr. Charles A. Harrison (chief engineer of the North-Eastern Railway) has just laid a memorial keystone in the new high-level bridge over the Wear, which is rapidly approaching completion.

Wandsworth, S.W.—The new poor-law infirmary in St. James's Road, of which the foundation stone has just been laid, is being built by Messrs. W. Johnson and Co., Ltd., of Wandsworth Common; from the design of Mr. J. S. Gibson, V.P.R.I.B.A., of London. The tender amounts to £66,550.

Watford.—A local firm of builders, Messrs. C. Brightman and Son, have secured the contract for the erection of a new station here for the Watford and Euston Electric Railway. The work, which is to be completed by January, 1910, will be put in hand almost immediately.

Watford.—The Local Government Board have refused a loan of £16,500 to the Urban Council, for the purchase of 50 acres of the Cassiobury Estate for a people's park. They consider the price too high, as the vendor's profit would be £60 an acre. A deputation from the Council is to wait upon the Board.

Weymouth.—The pier pavilion recently opened here, has a total seating capacity for 1,100 persons. It has been designed by Messrs. Magnall and Littlewoods, of Manchester, with the assistance of Mr. W. Barlow Morgan, M.I.C.E., the borough engineer of Weymouth.

Winchester.—The west wall of the south transept of Winchester Cathedral is to be shored up as well as the great south gable. This portion of the Norman fabric has always presented a somewhat unstable appearance, and its actual condition has now been ascertained to be altogether dangerous. The under-pinning processes now in operation, and the scaffolding and struts both within and without the walls, form a really remarkable sight. Some 180 men are employed in and around the cathedral on the restoration works.

Truro.—The parish church of St. Erme, situate about 3½ miles from the city of Truro, has undergone extensive renovation, at a cost of nearly £1,000, and has just been reopened. The present building, which stands on the original site of a mediæval church, was entirely reconstructed in the early part of the last century, and was opened for Divine service on February 20th, 1820. The embattled tower, built in the fifteenth century at a much later date than the old church, did not, however, require rebuilding in 1820. In the present renovation the walls have been made good and strengthened, and the east gable, which was falling outwards, has been restored. As the entire east wall had also a tendency to fall out two new buttresses have been built against it. The old flooring has been taken up and a new floor laid down on a bed of concrete. A marble pavement has been placed in the chancel, and the heads of the windows, which were plain, have been fitted with granite tracery. The windows have all been fitted with old glass which came out of the windows of Truro Cathedral as they were from time to time fitted with new stained glass. In addition to several minor improvements an entire new slate roof has been put on the church. The church is dedicated to St. Erme, who is said to have lived in the reign of Trajan, and by his strong attachment to the Christian cause awakened the vengeance of the Pagan emperor, who committed him to prison for refusing to sacrifice to idols, and in the reign of his successor, in the year 118, he was beheaded for persisting in his opposition to idolatry. The church of St. Erme was extant and endowed long before the Norman Conquest, and the district was taxed in the Doomsday roll under the name of Ermen-hen, signifying old or ancient Erme.

Trade and Craft.

Patent Treads.

With reference to our article on the new factories at Kinlochleven, N.B., for the British Aluminium Co. we are asked to state that the Andrews-Hawksley Patent Tread and Engineering Co. supplied all the floor plates for the Electricity Power Station. These are now being largely used for this class of work, beng non-conducting, self-supporting, and reversible. We may say that among some of the important electricity power stations, where this form of floor plate has been adopted, may be mentioned the Great Western Railway power stations at Royal Oak, Shepherd's Bush, etc., also the Millbank Generating Station, Westminster, under C. Stanley Peach, Esq., F.R.I.B.A., and the Islington Borough Council Electricity Power Station.

Architectural Societies.

The award of prizes and studentships for 1908-–09, will be made at the next ordinary general meeting on Monday, January 18th, on which occasion, also, Mr. R. Stephen Ayling, F.R.I.B.A., will read his paper on "Public Abattoirs." Nine essays have been received for the essay prize, nine sets for the measured drawings prize, ten designs for the Soane Medallion, one application for the Owen Jones studentship, nine sets of drawings for the Pugin Studentship, twenty designs for the Tite prize, one application for the Godwin Bursary, and nine designs for the Grissill prize. The following gentlemen have been nominated for election. Objections to the election must be received before the 1st prox. The day of election is the business meeting on Monday, March 1, next.

As Fellows (3).—Dinwiddy, Tom Norman (A. 1901), London; Howell, William Roland (A. 1891), Reading; Willock, Richard (A. 1889), London.

As Associates (44).—All the candidates have passed the examination qualifying for Associateship.—Allner, James, Blandford, Dorset; Ash, Horace James, Nuneaton; Beswick, Alfred Edward, Swindon, Wilts; Bownass, James Everett, Windermere; Buckingham, Ernest Hugh (Special Examination), Norwich; Bush, Frederick Thwaites, London; Coldwell, Edward Smith, London; Daft, William Austin, Oxford; Dalton, Percy, Ainsdale, near Southport; Davies, Horace Francis, Chester; Dean, William, St. Leonards-on-Sea; Denman, John Leopold, Brighton; Foster, Reginald Charles, Loughton, Essex; French, Harold, London; Graham, Allan, London; Groves, Christopher, Newcastle-on-Tyne; Healey, Hugh, Rochdale; Hill, Thomas Harold, Manchester; Hosking, Thomas Stanley, Llandrindod Wells; Hunter, George Edward, Newcastle-on-Tyne; Ixer, Sydney Henry Howard, London; Lay, Harry George, Wellingborough; Major, William Paul, Bristol; Mobbs, Sydney Wilfred, Lowestoft; Mole, Charles Johns, Plymouth; Morley, Eric, Bradford; Neave, Stacey Arthur, Sydney, New South Wales; Penfold, John Thomas, London; Potter, Francis John, London; Ruddle, Alan Wilfrid, Peterborough; Smith, Charles Benjamin, Ipswich; Surman, John Burgess, Birmingham; Sutcliffe, William, Todmorden; Sutton, Basil Hope, Reading; Sykes, Frank, Manchester; Thomasson, William Joseph Mate, Bournemouth; Tyndall, Richard John, London; Vanes, Robert Newton, London; Vaughan, James Henry, Newport, Mn.; Ward, Frank Dorrington, Hastings; Warren, Henry George, London; Whittaker, Thomas Herbert, Nottingham; Wilson, William Hardy, Sydney, New South Wales; Wood, Ernest Marshall, Cardiff.

As Hon. Corresponding Members (2).—Delphy, Adrien, Architecte, Archéologue, Laureat de l'Académie des Beaux-Arts de Bruxelles 1879; of 63 rue Belliard, Brussels; Girault, Charles Louis, Architecte du Gouvernement, Membre de l'Institut de France, Officer de la Légion d'Honneur; of 36 Avenue Henri Martin, Paris

The Royal Institute solicitors have received an intimation from the clerk of the Privy Council that His Majesty the King has been pleased to approve the grant of a supplemental charter as prayed for. This supplemental charter provides for, among other things, the creation of a new order of members—Licentiates.

The annual exhibition of designs and drawing submitted for the Institute prizes and studentships, 1908-1909, opens on Tuesday, 19th January, in the Gallery of the Alpine Club (entrance in Mill Street, Conduit Street, W.). Open each day from 10 a.m. to 8 p.m., the exhibition closing on January 30th.

* * *

The Architectural Association.

At the ordinary general meeting of the Architectural Association, held on January 8th, the following gentlemen were unanimously elected:—Mr. W. G. Newton, 13, Earl's Terrace, Kensington, W., proposed by Mr. Gerald C. Horsley and Mr. Ernest Newton; Mr. W. J. Price, 35, Airlie Gardens, Ilford, E., proposed by Mr. Arthur Stratton and Mr. R. Elsey Smith; Mr. M. F. Surveyor, 19, Craven Street, Strand, W.C. proposed by Mr. Leonard Stokes and Mr. W. Howard Seth-Smith.

The president (Mr. Walter Cave), then announced that the A.A. life class would have to be discontinued. unless more students joined. The class was run at a loss if there were less than twenty-four members, and at present there were only seven members. He then proposed votes of condolence with the widow and family of the late Mr. W. M. Fawcett, and with the family of the late Mr. E. A. Gruning, which votes were carried in sympathetic accord by the whole meeting. The President then commented briefly upon the lives of the deceased gentlemen, and pointed out that Mr. Fawcett had executed some admirable work at Cambridge.

Mr. Searles-Wood, before reading his paper on "Building Materials" (of which the first portion appears on another page), hoped he might supplement the President's words by a few remarks. Mr. Fawcett, he observed, was a great admirer of the A.A. excursions, and for many years past had been a regular member of the ordinary annual excursions, and the excursion to Italy. It was due to Mr. Fawcett, he believed, that Mr. J. D. Sedding was introduced to the A.A. He was not quite certain of this, however,—possibly it was that Mr. Fawcett's introduction should be credited to Mr. Sedding.

It was announced that at the next ordinary general meeting, on January 22nd, at 7.30 p.m., the paper to be read is one on "Reinforced Concrete," by Mr. J. H. Markham. Mr. Buckland's paper on "Schools," originally set down for that date, is to be read on February 5th.

* * *

Glasgow Institute of Architects.

The members of the associate section of the Glasgow Institute of Architects recently visited the Merchants' House of Glasgow—the reconstruction scheme of which is now well forward—and the new offices of the Clyde Trust, in Robertson Street. The visitors were shown through the Merchants' House by Mr. Blane, of Messrs. John Burnet and Son, architects. When the alterations and reconstruction are completed, the building, which is situated at the north-west corner of George Square, will consist of the old basement, ground, first and second floors reconstructed and improved, with three additional storeys of offices. The additional storeys are fast approaching completion. The original building was erected about thirty years ago. Fronting George Square and West George Street a new facade has been carried out in modern Renaissance style, to harmonise with the old portion, the three new storeys being grouped together with a row of Ionic columns extending the full length of the frontages and gripping in the old tower at the angle of the building. The staircases are finished in grey and white marble up to the level of the Merchants' Hall, and above that in grey and white tiles. The hall itself has been entirely reconstructed with a view to improving the lighting and acoustics. Formerly there was a heavy timber roof rising 52ft. from the floor to the ridge. The ceiling has been lowered by 20ft., and now that the hall has been tested, the acoustics have been found to be most satisfactory. Mr. John James Burnet, A.R.S.A., is the architect.

* * *

Liverpool Engineering Society.

In a paper on "Pile Wharves in Tidal Waters," recently read before the Liverpool Engineering Society, Mr. Somers H. Ellis dealt only with the open-work or framed structures and their materials. Given favourable conditions, a solid wall of masonry or concrete was obviously the best. The advantages of timber for wharf making were cheapness, ease and rapidity of construction, feasibility of inspection and repair, and a high degree of elasticity. But in clear sea water timber was attacked by the teredo and other pests. The author has found that only aranga wood was able to resist the ravages of marine borers, but that wood could not now be obtained. Turpentine wood, a product of New Zealand, was said to be immune, but greenheart, Jarrah, Billian, and other heavy woods, only resisted for a time. At Southampton the teredo was practically unknown, but timber was quickly destroyed by the chelura. Wrought iron was less liable to corrosion in salt water than steel. In some cases where a depth of mud overlay a hard stratum, wrought iron might be used advantageously in combination with timber piles by driving down the latter until their heads were just above the surface of the ground, and then capping them with tightly fitting hollow iron cylinders, forced down over the piles and bolted to the super-structure and bracing above low-water level. As a general rule cast iron for foundations was confined to large-diameter cylinders sunk with compressed air. Referring to reinforced concrete in the construction of wharves, the lecturer said that as a material it was on its trial, and there had been too great a tendency to bring forward all the points in its favour, while making light of evidence that would tell in the opposite direction.

* * *

Newcastle-upon-Tyne and District Clerk of Works and Builders' Foremen Association.

A meeting of this association was held on Thursday, Dec. 17, when a paper was read by Mr. George Bennison, of H.M. Office of Works, London. Mr. M. D. Gladders occupied the chair. The lecturer took as his subject "The Influence of Materials upon Architecture." From pre-historic times to the present day, the historical influence of materials upon design was very ably traced by the lecturer, with the aid of upwards of 70 lantern slides. Having stated that architecture was an "Affair of materials, the true and proper use of which moulds the style," the lecturer then went to early Egyptian Architecture, showing the stone columns and buildings as having been derived from an earlier mud and reed type. Assyrian Architecture was then stated to have developed from a mud type to that of sun-burnt bricks, this being the early introduction of bricks; no doubt the smallness of the units and not having stone or timber at hand (in some parts) the builders then introduced the arch, first as oversailing courses. The resemblance of the Grecian establature to that of a wooden construction, was then pointed out, thus giving the theory that early Grecian Stone Architecture probably developed from that of timber constructions. The Romans having unlimited unskilled labour at hand, and wishing to use this to the best advantage, they introduced a method of building with waste rubble stone and puddled clay, which gave the earliest forms of concrete structures. The Gothic Age was stated to be a period when builders obtained fine results, not by employing massive and strong materials, but by a delicacy of workmanship. Having described Modern Architecture as an age of upheaval and a period of bad design, greatly owing to the demands of commercialism, the lecturer very strongly condemned our present day street architecture—stating that he thought the present day architects had not given serious attention to the design of ferro-concrete buildings. He said he thought the proper design of same would not be by sticking ornaments upon the surface, or imitating other materials, but by pure lines, good proportion, and sweetness of curves. The lecture was very much enjoyed by a large audience, and a vote of thanks was passed to the lecturer on the motion of Mr. R. Wilson, seconded by Mr. T. Pigg. Mr. Bennison briefly responded.

Bankruptcies

GANN, HUGH MORTIMER, builder and lead merchant, West Mersea. First meeting, Cups Hotel, Colchester, Jan. 22, at 2. P.E. Colchester C.C., same day, at 11.30.

HARDY, LEVI, joiner and builder, Nottingham Road, Kegworth. First meeting O.R.'s, Leicester, Jan. 13, at 12. P.E., The Castle, Leicester, Jan. 15, at 10. R.O., Dec. 30. Adj. same day.

PERKINS, W. T., builder, 62, Church Path, South Acton. Adj. Dec. 17. (Amended notice.)

RICHARDSON, G. R., surveyor, Dawunkuttie, Adelaide Road, Surbiton, and 10, Bolton Gardens, Teddington. Adj. Dec. 22.

TRITT, THOMAS, builder, 36, Crescent Road, Wood Green. P.E. Edmonton C.C., Feb. 1, at 11.30.

Coming Events.

Wednesday, January 13, and Thursday, Jan. 14.

SURVEYORS' INSTITUTION.—Students' Preliminary Examination.

Wednesday, January 13.

NORTHERN ARCHITECTURAL ASSOCIATION.—Meeting of Council, 7 p.m.: Mr. W. H. Knowles, F.S.A., F.R.I.B.A., on "The Romano-British City of Corstopitum, Corbridge."

NORTHERN POLYTECHNIC ARCHITECTURAL AND BUILDING STUDENTS' ASSOCIATION.—President's At Home and Members' Reunion.

Thursday, January 14.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—General Meeting.

SOCIETY OF ARCHITECTS.—Prof. Henry Adams, on "The Stability of Walls." 8 p.m.

Friday, January 15.

INSTITUTION OF MECHANICAL ENGINEERS.—General meeting. 8 p.m.

Saturday, January 16.

ARCHITECTURAL ASSOCIATION.—First spring visit, to Messrs. Selfridge's new premises in Oxford Street. Members to meet at the building at 3 p.m.

Monday, January 18.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. T. Stephen Ayling, F.R.I.B.A., on "Public Abattoirs." Award of Prizes and Studentships, 8 p.m.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. T. Faulkner Shepheard on "Competitions."

UNIVERSITY OF LONDON.—Mr. Banister Fletcher, F.R.I.B.A., on "German Renaissance (and Modern) Architecture." 8 p.m.

Wednesday, January 20.

GLASGOW INSTITUTE OF ARCHITECTS.—Mr. Ramsay Traquair, A.R.I.B.A., on "Mediæval Architecture of Greece."

EDINBURGH ARCHITECTURAL ASSOCIATION.—Mr. A. Muir, on "Architecture and Social Evolution." 8 p.m.

NORTHERN ARCHITECTURAL ASSOCIATION.—Students' Meeting. Mr. C. I. Greenhow, on "The Early English Period." 7.30 p.m.

NORTHERN POLYTECHNIC ARCHITECTURAL AND BUILDING STUDENTS' ASSOCIATION.—Discussion on "Apprenticeship," opened by Mr. W. P. Render. 8 p.m.

Friday, January 22.

BIRMINGHAM ARCHITECTURAL ASSOCIATION. — Mr. Arthur S. Dixon, M.A., on "Early Roman Churches."

ROYAL SANITARY INSTITUTE.—Provincial Sessional meeting. Visit to the Manchester Royal Infirmary, 2.30 p.m.; Discussion on "The Manchester Royal Infirmary from the Hygienic, Sanitary and Aesthetic Points of View," to be opened by Mr. Edwin T. Hall, V.P.R.I.B.A., followed by Mr. John Brooke, F.R.I.B.A. 7 p.m.

ARCHITECTURAL ASSOCIATION.—Special general meeting, 7.30 p.m., to consider proposed alterations in the by-laws; also ordinary general meeting, with paper by Mr. J. H. Markham, on "Reinforced Concrete."

Tuesday, January 26, and Wednesday, January 27, 1909.

NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS.—Annual meetings.

Thursday, January 28.

MANCHESTER SOCIETY OF ARCHITECTS.—Mr. Arthur T. Bolton, A.R.I.B.A., on "The Dome as the Basis of an Architectural System." 6.30 p.m.

Monday, February 1.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—President's Address to Students, and Presentation of Prizes.

Friday, February 5.

ARCHITECTURAL ASSOCIATION.—Mr. H. T. Buckland on "Schools." 8 p.m. (Altered from Jan. 22.)

Insurance.

Subscribers to "The Builders' Journal" are entitled to a Free Insurance for £500. Every subscriber should apply for this, sending a postcard with the name of the newsagent with whom the order has been placed. Subscribers can also obtain a General Accident and Sickness Insurance (the "Lighthouse" policy) at a reduced premium, which includes the Annual Subscription to this Journal. A pamphlet giving full particulars can be obtained free on application.

Free £500 Accident Insurance Coupons have this week been sent to the following:

H. I. W. (Lancaster), W. M. (Sheffield), J. D. C. (Sheffield), C. B. (Sheffield), W. L. (Sheffield), E. P. M. (Llandudno), J. W. (Great Yarmouth), J. D. (Birmingham), R. P. (Altrincham), W. T. (London), J. H. H. (Bridlington), A. F. S. (Aberdeen), A. McG. M. (Coatbridge), A. J. A. (Birmingham), G. B. (Liscard), G. W. C. (Nottingham), P. E. (Reading), H. H. (Liverpool), D. W. I. (Southport), W. J. L. (Sheffield), L. P. (Wigan), A. S. (Sunderland), H. S. (Sheffield), P. S. (London), G. W. S. (Barnsley), W. W. T. S. (London), A. J. B. (Sheffield), H. M. M. (Manchester), C. W. P. (London), G. M. (Preston), H. C. H. (West Hartlepool), J. A. (Burnley), R. S. M. (Netley Abbey), J. S. (Sheffield), S. J. B. (Bromsgrove), J. F. M. (Eccles), R. R. (Bradford), W. R. T. (Dewsbury), W. G. (Dewsbury), S. C. (Dewsbury).

C. M. O. S. (London), S. H. (London), F. G. K. (London), W. B. S. (Cowdenbeath), D. H. S. (Norwich), J. M. (Pontypridd), G. A. K. (Douglas), H. H. (London), J. H. (Hornsey), R. S. (Leicester), J. J. (Oldham), W. W. (Leicester), G. S. (Leicester), W. S. (Leicester), T. J. (Birmingham), A. J. C. M. (Brighton), W. T. H. (Canonbury), G. P. (Mansfield), G. F. (Mansfield), H. S. (Sutton-in-Ashfield), E. T. H. (London), H. S. (Sutton-in-Ashfield), P. G. (Mansfield), B. A. (Wellingborough), J. B. (Battersea), M. F. (Macclesfield), W. H. (Liverpool), A. F. H. (Coventry), H. L. Gateshead), A. E. L. (Wellington), F. M. (Leeds), F. E. O. (Bromsgrove), F. R. G. W. (Wandsworth), J. W. (Ayr), W. M. W. (Ticehurst), G. J. H. (Prestwick), J. A. V. (Barrow), H. P. A. (London), C. H. B. Q. (Westminster), E. N. (London), J. R. B. (Sutton), A. W. N. (Brighton), J. C. (Bradford), C. J. V. (Mansfield), J. E. F. (Bradford), T. H. (Bishop Auckland), A. J. F. (Sheffield), W. R. U. (Sheffield), W. L. (Sheffield), J. C. W. (Sheffield), J. S. T. (Sheffield), W. C. J. (London), J. B. (Sheffield), H. G. (Altrincham), E. H. (Barnoldswick), W. P. (Bradford), W. H. A. (Rochdale).

G. E. P. (Sheffield), H. C. W. (London), J. B. W. (Glasgow), F. G. R. (London), A. B. (Morley), W. B. (Radcliffe), G. A. (King's Heath), A. G. L. (Bristol), G. R. (Smethwick), A. L. (Edinburgh), T. W. M. (Leeds), T. B. (Bristol), R. R. (Bristol), F. B. (Bristol), J. C. (Bristol), K. J. C. (Bristol), M. H. (Hull), H. R. S. (Peckham), T. F. (Padiham), A. J. C. (Mansfield), C. E. G. (Mansfield), H. M. (Bournville), T. G. (London), C. A. O. (Dublin), A. K. P. (Haywards Heath.

New Companies.

PERRY AND CO. (BOW), LTD., capital £400,000, to adopt an agreement with H. H. Bartlett, trading as Perry and Co., for the acquisition of the business of a contractor carried on by him, and certain property held therewith, and to carry on the business of contractors and engineers, contractors for public works, builders, brick and tile manufacturers, timber merchants, colliery proprietors, stone quarry owners, concessionnaires, etc. The first directors are H. H. Bartlett and H. A. Bartlett. Registered office, 56, Victoria Street, Westminster. Registered December 9, by Munns and Longden, 8, Old Jewry, E.C.

F. H. GILBODY AND CO., £3,000 (£1). Builders' merchants, plumbers, etc. To take over the business of F. H. Gilbody and Co., of 51-53, Bridge Street, Manchester. Registered December 7, by Jordan and Sons, Limited, 116-117, Chancery Lane, W.C.

SUMMERHILL PARK DEVELOPMENT SYNDICATE, LTD. Capital £15,000. To acquire, deal with and turn to account lands, buildings, and other property, to carry on business as builders, contractors, etc. Registered office, Bank Chambers, St. Stephen's Avenue, Bristol. Registered December 24.

DENNISON, KETT AND CO., LTD. Capital £3,000. To carry on the business of mechanical and electrical engineers and contractors carried on at 11, Queen Victoria Street, E.C., and 61-3, Lant Street, S.E., as Dennison, Kett and Co. Registered office, 11, Queen Victoria Street, E.C.

THOMAS HEATH, LD. Capital £3,250. To take over the business of a builder, contractor, and decorator, carried on by Thomas Heath at 40, South Eaton Place, S.W., and at High Street, Towcester. The first directors are T. Heath, T. H. Heath and W. B. Irvine. Registered office, 40, South Eaton Place, S.W. Registered Dec. 21.

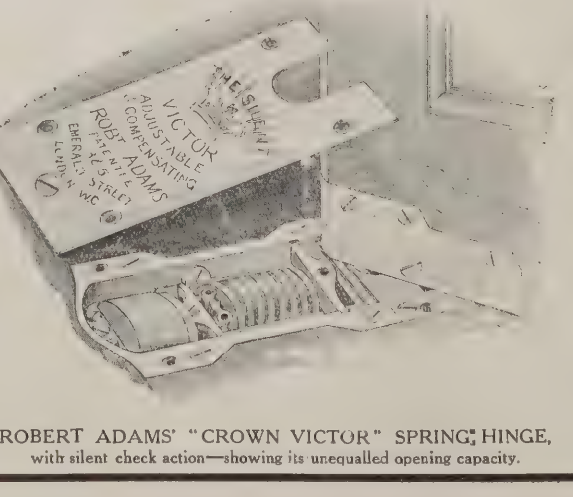
HANWELL BUILDING MATERIALS SUPPLY CO., LTD. Capital £1,000. To take over the business of a fixture and general building material dealer carried on by G. Tatum, of The Broadway, Hanwell, Middlesex. G. Tatum is the first director. Registered December 22.

"The Architectural Review."
A Magazine of Architecture
and the Arts of Design.
Edited by
MERVYN E. MACARTNEY,
B.A., F.R.I.B.A., F.S.A.
Price 1/- Monthly. Annual
Subscription 16/- post free.

Technical Journals, Ltd.
CAXTON HOUSE,
WESTMINSTER, S.W.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.

PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE,
with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.

60 HIGHEST AWARDS.

The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing .

— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

THE NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS OF GREAT BRITAIN AND IRELAND.

THE COUNCIL, 1908.

President:
C. H. BARNSLEY (BIRMINGHAM).

Senior Vice-President:
E. J. BROWN (LONDON).

Junior Vice-President:
COUNCILLOR S. SMETHURST, J.P. (OLDHAM).

Hon. Vice-Presidents:
ROBERT NEILL, J.P. (MANCHESTER).
J. HOWARD COLLS (LONDON).
COUNTY ALDERMAN J. BOWEN, J.P. (BIRMINGHAM).
T. F. RIDER, F.R.G.S. (LONDON).
J. STEVENSON JONES (LIVERPOOL).
ALDERMAN W HOLDSWORTH, J.P. (BRADFORD).
A. KRAUSS (BRISTOL).
B. I. GREENWOOD (LONDON).
C. W. GREEN (LIVERPOOL).
ALDERMAN W. H. JESSOP, J.P. (HUDDERSFIELD).
WM. SHEPHERD (LONDON).
GEO. MACFARLANE (MANCHESTER).
WM. NICHOLSON (LEEDS).

Hon. Treasurer:
J. W. WHITE (SUNDERLAND).

Hon. Auditors:
JAS. WRIGHT (NOTTINGHAM). F. HIGGS (LONDON).

Scottish Representatives (Honorary Members):
ALEX. NICOLL (DUNDEE). JAS. LESLIE (ABERDEEN).

Representatives on the Employers' Parliamentary Council:
The President (C. H. BARNSLEY, BIRMINGHAM). WM. SHEPHERD (LONDON)

Secretary:
A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

POINTS FROM THE FEDERATION, CENTRE, AND ASSOCIATION REPORTS.

The Council meetings of the Executive Council of the National Federation are to be held on January 26th, in the Balmoral Room of the Trocadero Restaurant, and the annual general meeting will be held at the same place on January 27th. The next National Conference of Secretaries is to be held in Leeds, probably about October 20th. It is mentioned that the question of an adequate supply of apprentices in certain branches of the building trade is becoming urgent, and that the decay of apprenticeship in France has given rise to most of the troubles that beset French building contractors. A further matter that appears to be assuming general importance is the drafting of the fair-wages clause in contracts. The preparation of a model clause, to assist branch associations in dealing with the subject, is being considered by the Federation.

* * *

A large number of copies of corporation fair-wages clauses has been collected by the Secretary of the Lancashire, Cheshire, and North Wales Federation, and it was resolved to send them to the National Federation as material to assist in the formulation of a standard or model clause. Relations with the operatives are becoming unsettled, as many as thirteen local associations having either given or received notice of alteration of working rules .

The question of the direct tendering to architects by electricians has been carefully considered by the Northern Counties Federation, whose representatives have met delegates from the Electrical Contractors' Association, with the result that it has been provisionally agreed that both bodies shall jointly approach the architects with the object of arriving at an equitable arrangement. The Federation has taken action with respect to conditions of tendering (in connection with a drainage scheme), by which it was required that the priced schedule must be returned with the tender, otherwise the deposit paid for the quantities would be retained. A rule of the Federation provides for the priced schedule being forwarded after the lowest tender has been ascertained. The proprietors of the work promised to give due consideration to the views of the Federation.

* * *

Twenty applications for membership were presented at the December meeting of the Sheffield Association, the largest number ever received by this association at one meeting. Sheffield's contribution of £59 odd, it is also recorded, is the largest amount subscribed to the Yorkshire Federation by any association.

* * *

Oldham and District Association have given notice to the joiners of a demand for the reduction of wages from 9½d. per hour to 9d. The notice expires on May 1st. The Association is endeavouring to prevent the adoption by the Corporation of certain arbitrary clauses in contracts, and is fortified in its action with information collected and supplied by the National secretary, as to the clauses in operation in other towns. The Association is also keeping a watchful eye on the proposed Oldham Corporation Improvement Bill, 1909, the draft of which reveals some clauses that are obnoxious to the interests of contractors.

* * *

The value of combination is again seen from an instance reported by the Barnsley Association. A member had been reported by the borough surveyor for committing a breach of the by-laws by erecting a wooden structure without submitting a plan. As the structure in question was merely a builder's cabin or hut, and therefore expressly exempt from the by-law, the builder naturally resented the imputation, and he laid his grievance before his Association. The matter having been discussed by the Association, a deputation was sent to the Improvements Committee of the Town Council, by whom it was assured that the friction had arisen in consequence of a misunderstanding, and that, so far as the Committee was concerned, a builder's hut or cabin could be erected without let or hindrance.

MONTHLY OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

Meetings.

The January meetings of the Executive Council of the National Federation will be held in the Balmoral Room of the Trocadero Restaurant, on Tuesday, January 26th, the 1908 Council at 10.30 a.m., and the 1909 Council at 2.30 p.m. The annual general meeting will be held at the same place on Wednesday, January 27th, at 10.30 a.m.

Protection of Members.

The case of a sub-contractor member is engaging the attention of the Committee. The materials used for a certain job were selected by the building owner and the architect, were specially named in the quantities and ordered in strict conformity therewith, and were approved on delivery by a resident clerk of works and by the architect. The final certificate was paid some months ago. It turns out that the selected materials are not durable, and now it is sought to make the sub-contractor financially responsible for the defects. Meanwhile the manufacturer has gone into liquidation.

Next Conference of Secretaries.

In response to a cordial invitation from the Yorkshire Federation, it has been decided to hold the 1909 National Conference of Secretaries at Leeds. The date is yet to fix, but it will probably be about October 20th if that is convenient to the Yorkshire Federation. The report of the last Conference is in the press, and will be issued shortly.

Coal Mines (Eight Hours) Bill.

The opposition of the great coal-consuming industries to this Bill has resulted in the day being made 8½ hours instead of 8 hours. The Bill comes into operation for part of the country in July, and for the rest in January, 1910.

Fair Wages Clause in Contracts.

As this question is exciting attention in various districts, a suggestion by the Lancashire, Cheshire, and North Wales Federation is being acted upon, and consideration is being given to the drafting of a model clause to assist our branches when dealing with this question.

Recommendations for Annual Meeting.

Recommendations in regard to the following will appear on the agenda:—

(a) To rescind resolution limiting the sale of contract forms to members only.

(b) To elect and constitute the joint committee under the N.A.O.P. Agreement.

(c) To include in the subscription of individual members of the National the supplying free of the official journal.

(d) That the application of the builders' labourers for admission as parties to the National scheme of conciliation be not granted, but that certain facilities be given for their representation on local boards of conciliation where agreements are in existence between them and the employers, with provision also enabling cases to be referred to the higher boards on certain terms.

Annual Return of Membership.

Reports of this have been sent to the federations, and through them to local associations. It is evident that the question of an adequate supply of apprentices in some of the branches of the building trade is becoming an urgent one. Most of the troubles which beset French building contractors are admitted to arise entirely through the decay of apprenticeship.

Proceedings of Council.

will this year be reported and printed for distribution next morning to representatives attending General Meeting, with a view to assisting them in the discussion of the agenda of the General Meeting.

THE NORTHERN CENTRE OF THE NATIONAL FEDERATION

COMPOSED OF

The Lancashire, Cheshire and North Wales Federation, The Yorkshire Federation and The Northern Counties Federation.

Secretary: JAMES DENVER, Cromwell Buildings, Blackfriars Street, Manchester.

There is nothing to report from the Northern Centre for the past month, no meeting of the Council having been held.

A circular has been issued to all members of the Council informing them that the annual meeting has been fixed to be held in London on Monday evening, January 25th, at 5.30 o'clock.

THE LANCASHIRE, CHESHIRE AND NORTH WALES FEDERATION

Secretary: JOHN TOMLISON, Cromwell Buildings, Blackfriars Street, Manchester.

A meeting of the Finance Sub-Committee of the Lancashire, Cheshire, and North Wales Federation was held on Friday, December 11th, to consider the question of future publication of the official Year Book, and it was decided to recommend to the Administrative Committee "that in future the half-yearly and annual reports be put into book form, with the list of members, copy of rules, and the additional information as printed in the present Year Book, and to issue it free to members in place of the present book and sheet reports, if found practicable on ascertaining the cost.

The president reported that he had had some correspondence with the Lancaster Association, and he understood that they had arranged to carry on their local organisation, and hoped soon to be in a position again to support Federation principles. This report was considered very satisfactory.

The Administrative Committee held their usual monthly meeting on Friday, December 11th.

The secretary reported the result of correspondence which had taken place between himself and several private firms with reference to tenders without quantities.

The accounts for the quarter as presented by the secretary were recommended to the Executive Board for payment.

The half-yearly report, as drafted by the secretary, was adopted for presentation to the Executive Board, with one or two slight alterations.

The secretary reported that he had received a large number of copies of corporation "fair wages" clauses in response to the resolution passed at the last meeting, and after a lengthy discussion it was resolved "that the copies be sent to the National Federation for their consideration, with a view to suggesting a standard clause for adoption."

A case was reported from one of the local associations in which an architect was seeking to impose what were considered to be unjust penalties on one of the members for not having completed a certain contract within the specified time, which the builder had been unable to control. After giving full consideration to the matter, it was decided to refer the case to a small sub-committee.

It was agreed that a Conference of Lancashire, Cheshire and North Wales Federation Secretaries be arranged to be held early in the New Year.

Correspondence was read between the secretary of the National Conciliation Board and the Rochdale secretary with reference to the decision given by the Board as to the notice of discharge to joiners, and the secretary was instructed to communicate with the Rochdale Association thereon.

The quarterly meeting of the Executive Board was held at the Boardroom, Manchester, on Monday, December 21st, when the president presided over a good attendance of members.

The accounts for the quarter, as approved by the Administrative Committee, were passed for payment. It was decided to hold the March meeting of the Board at Blackburn.

The revised rules of the Bury Association were approved on the recommendation of the Administrative Committee.

Some correspondence was read on the subject of daywork charges, and the secretary was instructed to endeavour to arrange a conference between several of the local associations thereon to secure uniformity if possible.

Several other matters of trade interest were discussed, but no formal resolutions were passed.

The half-yearly general meeting was held immediately after lunch on the same day as the Executive Board meeting, at the Victoria Hotel, Manchester, when there was a very good attendance of members from the federated towns, over which the president (Mr. William Bullen) presided.

The half-yearly report presented by the Committee, which dealt at great length with the question of membership and organisation, and the very unsettled relations with the operatives during the past half-year, was taken as read, and adopted for circulation amongst the members. It is striking to note from the report that no less than thirteen of the thirty-two local associations have either given or received notices for alterations to the operatives' working rules.

It was decided to hold the annual general meeting at New Brighton in June.

The representatives on the National and Northern Centre Councils were elected by ballot. Messrs. W. Tinker, Manchester; J. E. Tinline, Bury; and Frank Woods, Bolton, were elected in the place of Mr. Walter Marshall, Manchester, the Liverpool President for the time being, and Mr. H. Warbrick, Lancaster; the remainder were re-elected.

Messrs. J. Storrs, S. Smethurst, and G. Macfarlane were re-elected to represent the Federation on the National Conciliation Board. Messrs. S. Smethurst, G. Macfarlane, Wm. Bullen, and H. Lever were re-elected the representatives on the Northern Centre Board; and Mr. John Cartmell, Preston, was elected to fill the place of Mr. Walter Marshall, who desired to retire.

The proposed rule providing for arbitration between sole and sub-contractors in business disputes was adopted as a rule of the Federation.

The position of the reserve fund was reported on by the secretary, and the president and several members of the committee made earnest appeals to the representatives present for further subscriptions from their associations.

Several other matters of trade interest were discussed, including the arrangements made by the National Federation with the BUILDERS' JOURNAL, but no formal resolutions were passed, and with a vote of thanks passed to the President for his services in the chair the meeting terminated.

LOCAL ASSOCIATIONS AFFILIATED TO THE LANCASHIRE, CHESHIRE AND NORTH WALES FEDERATION.

BURY AND DISTRICT ASSOCIATION.

Secretary: Robert Hall.

The monthly meeting of the Bury and District Association was held on Wednesday evening, December 30th, 1908, the president, Mr. John Inman, in the chair. The secretary presented his report of the half-yearly general meeting of the Lancashire, Cheshire, and North Wales Federation, held in Manchester on Monday, December 21st 1908.

The proposed new Bill of the Bury Corporation was discussed at some length, so far as the building clauses affect the trade, after which it was agreed that the secretary prepare a report upon the various clauses for the next meeting.

A circular letter from the Federation respecting patent slab partitions was discussed, but no

ROBERT HALL,
Building Surveyor,
52, Frederick Street, BURY

With over 35 years practical experience of the Building Trade, and during the last 15 years a very varied experience in measuring up and adjusting contract and other accounts, is prepared to undertake and submit quotations for the following:—

The Measuring-up and Adjustment of Accounts,
Collection and Settlement of Accounts,
Assistance given in Estimating,
Annual or other Periodical Stocktakings,
Private Enquiries and Arbitrations undertaken,
or any other special work incidental to that a Builder or Contractor.

52, Frederick St., BURY.

HOLLIS BROTHERS & CO.,
Timber Importers.
HULL. Jameson Chambers.
LEICESTER. Queen Street.

Wood Block Flooring.

H. B. Hardwood,
Floorings,
Oak, Maple, etc.

Large Stocks of Joinery Wood held under cover.

Mouldings, etc., to design.

D. LORDEN,
Plasterer,
Plaster and Cement Merchant.
Worker in Fibrous Plaster &c,
Tom Brown Street, RUGBY.

All that is Best
IN
Accident and Illness Insurance
of every description can be obtained at prices to suit all pockets on application to
The Ocean Accident and Guarantee Corporation, Ltd.
BRANCH OFFICE: 233, STRAND, W.C.
Fire, Burglary and Motor Car Insurance.

decision was arrived at, owing to the want of a definition. A letter was read from the Operative Carpenters' and Joiners' Society respecting the question of the demarcation of work. The matter was left in the hands of the secretary.

LLANDUDNO AND DISTRICT ASSOCIATION.

Secretary: E. P. Morris, Accountant.

The fifth annual general meeting of the Llandudno Association was held at the secretary's offices, on Thursday, December 10th, the president in the chair.

The fifth annual report was read and adopted. In the report it was stated that the relations with the operatives had been satisfactory during the past year, no question having arisen for discussion. During the past year the District Council have been making arrangements for the rebuilding of the public library, and a suggestion that local stone and Welsh slate should be used was favourably received by the Council and the architect. The committee were asked by the District Council whether they were prepared to quote for the work without quantities, and after full discussion it was decided that it would be fairer to both parties if quantities were prepared, and this conclusion was accepted by the Council. It was further mentioned in the report that during the past year the BUILDERS' JOURNAL has been adopted as the official organ of the National Federation, and that full reports of association matters regularly appear in its pages. The committee again draw attention to the importance of insisting on the use of the R.I.B.A. contract form on contracts exceeding £500, copies of which can be had from the secretary at the price of 1s. each. The committee also urge the desirability of inducing builders' merchants and others to join the association, and of giving preference, as far as possible, to such honorary members when ordering goods.

Officers were elected as follows:—President, J. O. Thomas, J.P.; vice-presidents, John Roberts and Henry Hughes; hon. treasurer, Geo. Roberts; committee, Councillor Hugh Edwards, Messrs. H. W. Lance, Ed. Owen, R. T. Owen, and Luther Roberts.

The committee was asked to consider the question of uniform starting time.

A vote of thanks to the past president and to the secretary closed the meeting.

MANCHESTER, SALFORD AND DISTRICT ASSOCIATION.

Secretary: John Tomlison.

The monthly meeting of the General Committee of this association was held at the Boardroom Blackfriars Street, Manchester, on Thursday, December 10th, when the president, Mr. G. Macfarlane, presided over a good attendance of members.

The reorganisation of the association was the chief question under consideration, and several members reported results of interviews they had had with members who had not yet qualified under the scheme, from which it is expected that several more employers will affiliate themselves with the reorganised society.

It was decided to pay a further sum of £50 to the Lancashire, Cheshire, and North Wales Federation Reserve Fund; and the annual subscription to the same federation was also passed for payment.

The proposed amendments of the Northern Centre Executive to the Conciliation Board rules were approved with one exception, which will be brought before the National Board when the same are considered.

Two new members were elected to the association.

A vote of thanks was passed to the Joiners' Trade Committee for the manner in which they had dealt with the operative joiners' demand for an increase in wages.

OLDHAM AND DISTRICT ASSOCIATION.

Secretaries: Cowper and Dean, Accountants.

The number of members to date is 180.

The sub-committee of the Oldham and District Association appointed to deal with the fair contracts' clause will shortly meet again to discuss this matter further, and to elect representatives to appear before the Finance Committee of the Oldham Corporation. Every effort will be made to prevent the adoption by the Corporation of the proposed new clauses in contracts, and information regarding the clauses in operation in a large number of other towns has been kindly supplied by Mr. A. G. White, the National secretary.

The draft of the proposed Oldham Corporation Improvement Bill, 1909, is now in the hands of the secretaries, and will be discussed at the same meeting, as it contains some arbitrary clauses in regard to building regulations.

The Joiners' Trade Committee have had under consideration the reduction of wages in view of the present state of trade, and due notice has been given to the operatives' society for reduction from 9½d. per hour to 9d. The notice expires on May 1st, 1909.

An interesting point affecting the employers who may have work in Failsworth is that a greater portion of this district comes under the Oldham working rules, and not under Manchester rules, which is an advantage to employers working in the district. This point has been settled by the Northern Centre Conciliation Board.

The Executive and Trade Committees have had many matters before them, and more than 20 local meetings have been held during the year, in addition to attendances at Federation and Conciliation Board meetings.

The annual general meeting will be held at the end of January, when a full report of the year's work will be presented to the members.

ROSSENDALE AND DISTRICT ASSOCIATION.

Secreary: Robert Hall.

At the annual general meeting of the Rossendale and District Association, held at the Queen's Arms Hotel, Rawtenstall, Mr. B. Constantine (of Messrs. Constantine and Lindsay) was elected president for the ensuing year, Mr. O. Ashworth senior vice-president, Mr. J. H. Hayle junior vice-president, Mr. W. T. Watson treasurer, and Mr. R. Hall secretary. A committee of nine members was also elected. The annual dinner was fixed for Wednesday, January 20th, at the Queen's Arms Hotel, Rawtenstall, at 6 p.m. The following guests were invited:—Mr. W. Bullen, president of the L.C. and N. Wales Federation; Mr. George Macfarlane, past president National Federation, and the surveyors of the three boroughs of Bacup, Haslingden, and Rawtenstall.

A question affecting one of the members, which had been placed before the Federation, was reported upon by the secretary, and approved.

WIGAN AND DISTRICT ASSOCIATION.

Secretary: R. Hollows, A.C.A., etc.

Meetings with the deputation from Operative Joiners' Society, respecting the notice for alteration to the present working rules, will be held early this month.

There is nothing to report of interest to the trade, except an excerpt from the report in the local Press respecting the work performed by the Coroporation, which was brought before their notice at the annual meeting. The matter was introduced to the meeting by Mr. James Howard, who submitted the toast, "The Town and Trade of Wigan," and said the rates had in the last decade practically doubled, and he failed to see what they in Wigan had to show for that double amount of rate. He noticed an observation at the last council meeting that the painting had cost three times as much as a contractor would do the work for. He did not see why their representatives should ever agree to paying three times as much as was necessary to have a good job. He did not think they were benefiting the ratepayers, but simply wasting the ratepayers' money by such a thing. If the work was in contractors' hands, they would have had an equally good job at one-third of the cost. There were direct proofs given in the little book, "Municipal Works Departments," that work done under the municipal works committee or department invariably cost a lot more than when done by a private contractor. When a private contractor had done work for a corporation, he had a specification to work to, and (he said this with all due respect to the officials who were placed over such work) the employer who had passed his life in the work was a better judge of what a really good job was. Their Town Council had been unfortunate in their undertakings. Some years ago they built a lot of cottages on the Vauxhall area, entering as speculative builders. They afterwards sold them at a loss of £60 a house. He did not see why the Corporation had any right to deal with the ratepayers' money in that way. Furthermore, the Corporation had made themselves into layers of tram-lines. He thought he was perfectly correct in saying that the lines laid by the Corporation cost twice as much as those laid by the contractor, and they were not one jot better. The Corporation built a tram shed down at Seven Stars Bridge, and from his observations he believed that any builder in Wigan would have been glad to provide labour and material for the brickwork of that tram shed at the price it cost the Corporation for the labour alone. He hoped their representatives would take these things to heart, and consider the interests of the ratepayers; because in letting their work out to contractors they were still providing work for workmen. As a proof of bad trade, he would mention, and they would be sorry to hear it, that during the past twelve months the association had lost more than twenty-five members. Those members had not left through any fault of their own. Trade had been bad. Taken upon the whole, they had been steady, hard-working, intelligent, industrious men, but the bad times had compelled them to resign their membership. He trusted that before long there would be an opportunity for them to rejoin, and he wished them every prosperity. The toast was drunk with enthusiam-and with it the names of the Mayor and Councillor Mather were coupled. Councillor Mather, in response, said he was very much impressed with the remarks of Mr. Howard, and he agreed with him. He was sorry his committee had been culprits in the matter, but it was against his own view, and he would vote for any work of the Corporation being put out to contract.

The Mayor said that he was very much struck with Mr. Howard's remarks.

There is nothing to report from the following associations affiliated to the Lancashire, Cheshire, and North Wales Federation: Altrincham, Ashton-under-Lyne, Barrow-in-Furness, Birkenhead and Wirrall, Blackpool, Bolton and Farnworth, Burnley, Chester, Crewe, Darwen, Heywood, Lancaster, Leigh, Liverpool, Longridge, Macclesfield, Middleton, Radcliffe, Rochdale, Southport, St. Annes-on-Sea, St. Helens, Stockport, Wallasey, Warrington. The report from Preston is held over.

THE YORKSHIRE FEDERATION

Secretary; J. DAVIDSON, 14, Park Row, Leeds.

LOCAL ASSOCIATIONS AFFILIATED TO THE YORKSHIRE FEDERATION.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

The number of members to date is 50.

The annual meeting of the Barnsley Association was held at the King's Head Hotel, Barnsley, on December 9th, 1908, Councillor G. Haigh, the newly re-elected president, occupying the chair. Twenty members were present. The minutes of the previous meeting having been confirmed, and the report of the last Yorkshire meeting submitted by the delegates, and approved, the president and secretary were appointed a deputation to wait on the town clerk to obtain a copy of the fair wages clause, at the request of Mr. Tomlison, secretary to the Northern Centre. An animated discussion took place with respect to the admittance of builders' labourers to the local Conciliation Board, the question of admittance being ultimately left in abeyance for the present.

A long and animated discussion took place on a complaint brought before the meeting by Mr. P. Dalby, a local builder and a member of the Federation, with respect to "alleged unjust treatment at the hands of the borough surveyor and the Street and Improvements Committee of the town council." The cause of complaint was as follows. Mr. Dalby, having practically completed the erection of a number of cottages, had negotiated for a plot of land on which to store for a little while his builder's cabin or hut. The borough surveyor reported to the Streets and Improvements Committee that Mr. Dalby was committing a breach of the local by-law which provides that no wooden or other erection shall be erected unless a plan of same has been submitted and approved by the above committee. A builder's cabin, however, is exempt from the above by-law, and Mr. Dalby justly and naturally resented the allegation that he had broken any by-law, and also the above committee's decision that he must remove the cabin or submit to the usual penalties. A report of the case appeared in the local Press. The meeting sympathised with Mr. Dalby, and the president, vice-president, and secretary were appointed a deputation to interview the Streets and Improvements Committee with a view to obtaining redress.

The secretary submitted his report of the past year's workings, and a hearty vote of thanks was accorded to him.

It was decided to hold an annual dinner jointly with the local Master Builders' Association.

The treasurer (Mr. H. Ashworth) submitted his sixth annual report, which was verified as correct by the auditors, and unanimously approved by the members, the treasurer receiving a hearty vote of thanks for his past services.

The election of the committee for the forthcoming year resulted as follows:—Masons, Messrs. Dalby, Higham, C. W. Squire, Walker, C. K. Taylor, and Councillor G. Millor; joiners, Messrs. Goodyear, J. Smith, Councillor W. G. England, J.P., and H. Pashley; plumbers, Messrs. Drawfield and J. A. Binns; painters, Mr. G. Fleetwood; plasterers, Messrs. T. Lindley and Wilcock; slaters, Mr. J. Denton (Messrs. Dawber, Townsley and Co., Ltd.).

Since the above meeting, the Streets and Improvements Committee of the Town Council received, at their usual monthly meeting, the deputation referred to. After the complaint had been heard, the deputation was assured that a builder could erect a cabin without let or hindrance on any site where he might be building, and that Mr. Dalby's case had arisen from a pure misunderstanding, owing to the largeness of the cabin, and nothing further would be heard of the matter. This assurance being very satisfactory, the deputation returned thanks and withdrew.

SHEFFIELD ASSOCIATION.

Secretary: Thos. Smith.

The monthly meeting of the Sheffield Association was held on December 8th, the president (Mr. Thos. Eshelby) presiding.

Letters were read from the Amalgamated Society of Carpenters and Joiners and the Manchester Order of Bricklayers, complaining that, in the former case, a member of the association was employing joiners for full summer time without paying overtime; while in the latter, the complaint was that walking time was not being allowed on a job. In the case of the joiners, it was pointed out that the overtime alleged was only temporary, the men being allowed to recover a little on the very short time they worked in September. The employers, however, were quite willing to comply with the strict letter of the rules, on the matter being brought to their notice. The case of walking time was more important as it once again raised the question of working contrary to an established custom of the trade, which stipulated that men engaged and paid on the job were not entitled to claim walking time. On this matter there was diversity of practice at the present time, and it was felt that the whole matter needed thorough discussion in order to save further bickering. To settle the matter temporarily, the employers concerned were willing to pay so far as the particular job in question had gone, but it was considered necessary to appoint a committee to consider the question.

The question of the payment of walking time to men engaged and paid on the job came up again as a separate item on the agenda, and led to a long and important discussion. It was shown by Mr. Boot that the present contention was that a firm established near a job outside the boundary—at least, when working on a Corporation job—was expected to pay walking time just the same as if the firm had its works in the centre of the town, and the irony of the thing was that the Corporation itself did not observe these conditions which it sought to impose on other contractors, while the conditions at the same time were contrary to established local practice. Mr. Boot thought that an office fixed on a job lasting over six months constituted in effect a separate branch of the firm. There was some diversity of opinion in regard to this, but there was absolute agreement on the fact that the way in which the question of walking time was being pushed forward constituted a serious menace to the local building trade, and it was unanimously agreed that a committee be appointed to consider the whole question and report to next meeting. A further resolution was also unanimously passed appointing the members of the Conciliation Board as the committee to consider the matter

YORK ASSOCIATION.

Secretary: J. Hague.

An executive meeting of the York Association was held on Friday, December 4th, when Mr. Sharp presided over a well-attended meeting. The reports of the various committees on the schedule of prices were submitted and approved, the draft schedule as approved being referred to the annual meeting for adoption. The proposed agenda for the annual meeting was fully discussed, and finally approved in accordance with the recommendations made.

The annual meeting was held at the Old George Hotel, Pavement, on Friday, December 11th. Mr. G. Sharp presided over one of the best-attended meetings ever held by the association. The minutes having been duly read and confirmed, the secretary read a report on the work during the past year, which was approved.

The following officers were elected:—President, the Right Hon. The Lord Mayor of York (Mr. Alderman J. Birch); vice-president, Mr. W. E. Biscomb (re-elected); treasurer, Mr. C. Dent (re-elected); secretary, Mr. J. Hague (re-elected). The executive was re-elected, with the exception that Mr. G. Sharp, th retiring president, succeeds Mr. Borwell. The trades' committee were re-elected. Representatives on Yorkshire Federation, the Right Hon. The Lord Mayor, Mr. W. E. Biscomb, and Mr. C. Dent; representatives at National meeting, Mr. G. Sharp, Mr. W. E. Biscomb, Mr. C. Dent, Mr. Councillor Hardgrave; auditors, Coun. J. Hardgrave and F. W. Birch.

There is nothing to report from the following associations affiliated to the Yorkshire Federation: Barnoldswick, Bridlington, Dewsbury, Grimsby, Halifax, Harrogate, Huddersfield, Hull, Malton, Morley, Scarborough, Wakefield. Reports from the Yorkshire Federation, and from the associations at Bradford, Leeds and Shipley are held over.

THE NORTHERN COUNTIES FEDERATION.

Secretary: W. H. HOPE, Solicitor, Post Office Chambers, 14, Norfolk Street, Sunderland.

The annual general meeting of the Northern Counties Federation was held at the Hotel Metropole, Newcastle-on-Tyne, on Thursday, December 17th, 1908, at four o'clock p.m., Councillor Stephen Easten, of Newcastle-on-Tyne, president, in the chair. There were also present Messrs. R. Heslop, Wm. Foster, J. C. Hope, and W. T. Weir (Newcastle), A. Ross, J. T. Armstrong, J. Shewan, W. J. Robertson, and J. G. Robertson (South Shields), J. T. Scott, J. Pelton, and J. R. Hadaway (North Shields), R. J. Huntley, W. B. Cooper, F. W. Ranken, J. M. Wright, and J. McMillan (Sunderland), T. Wilkinson, W. S. Davison, G. Hudson, W. Masters, P. Bray, and H. McNaughton (Middlesbrough), T. Brown, R. Johnson, J. Davison, F. W .Taylor, G. E. Grey, and L. Brown (Stockton-on-Tees), E. M. Tweddle, W. M. Thompson, J. Moore, and J. B. Wilson (West Hartlepool), H. L. Gradon (Durham), F. Oates (Chester-le-Street).

In the absence of the honorary treasurer (Mr. J. W. White, Sunderland), the audited balance sheet for the past year was submitted by Mr. F. W. Ranken (Sunderland), who proposed its adoption. This was seconded by Mr. R. J. Huntley, and carried unanimously.

The estimated income and expenditure for the ensuing year was considered, and, on the proposition of Mr. J. Davison, seconded by Mr. A. Ross, it was resolved: "That the annual subscriptions from the local associations to the Federation remain the same as last year, namely 1/3 per £100 of wages paid."

The secretary presented his annual report of the work of the Federation, which was adopted after Mr. Hope had been thanked.

On the proposition of Mr. Easten, seconded by Mr. W. J. Robertson (South Shields), Mr. J. Davison, of Stockton, was unanimously elected president. Mr. Davison thanked the members very heartily for his election, and said he had great pleasure in accepting the honour, and moved that a vote of thanks of the Federation be given to Mr. S. Easten for his services during his term of office. This was carried with acclamation.

On the proposition of Mr. J. T. Armstrong, seconded by Mr. J. Pelton, Mr. Alex. Ross, of South Shields, was unanimously elected senior vice-president. On the proposition of Mr. R. J. Huntley, seconded by Mr. J. McMillan, and supported by Mr. J. T. Armstrong, Mr. F. W. Ranken, of Sunderland, was elected junior vice-president. On the proposition of Mr. W. T. Weir, seconded by Mr. T. Wilkinson, Mr. J. W. White (Sunderland), was unanimously re-elected honorary treasurer, and Messrs. P. Bray (Middlesbrough), and J. C. Hope (Newcastle) were unanimously elected honorary auditors. The following were elected upon the executive council: Messrs. J. Davidson, A. Ross, F. W. Ranken, S. Easten, W. T. Weir, W. Foster, W. J. Robertson J. Pelton, J. Simpson, R. J. Huntley, W. B. Cooper, J. W. White, W. Masters, R. Johnson, and J. Proud. The following were elected on the National Council and the Northern Centre: Messrs. S. Easten (Newcastle), T. Wilkinson (Middlesbrough), J. Proud (West Hartlepool), (Mr. J. W. White, Sunderland, as honorary treasurer of the National Federation *ex-officio*). The National and Northern Centre Conciliation Boards:—Messrs. T. Wilkinson and J. W. White.

On the proposition of Mr. R. J. Huntley, seconded by Mr. J. T. Armstrong, Messrs. A. Ross and W. H. Hope (Federation secretary) were appointed the representatives of this Federation at the annual general meeting of the National Federation to be held in London on Wednesday, January 27th, 1909.

Mr. S. Easten gave a report upon the interview with the Education Building Sub-Committee of the Durham County Council, and the representatives of this Federation, when the question of the conditions of contracting was discussed. The result was that the Building Committee promised to give favourable consideration to the representations of the deputation.

Mr. Easten gave a report upon the meeting between the representatives of the electrical contractors and the representatives of this Federation to consider the question of direct tendering to architects, by electricians, with a view to securing proper consideration for the contractor. The decision arrived at was subject to confirmation by the Central Board of the Electrical Contractors' Association, and was to the effect:—"That this Federation and the Electrical Contractors' Association should approach the architects and lay the full facts before them—that the present direct tendering is giving dissatisfaction and causing friction in carrying out contracts—with a view to a satisfactory understanding being arrived at as to the respective interests of the parties concerned."

Correspondence showed that this Federation had under consideration the question of fair wages clauses in the conditions of contract of corporations, rural and urban district councils and other public bodies. Information is being obtained from different quarters.

The Federation's attention was drawn to a set of quantities issued for a drainage scheme in the Newcastle District. One of the conditions was that unless the priced schedule was returned with the tender the deposit paid for the quantities would be retained. This is in direct conflict with the rule of this Federation, which provides for the priced schedule being forwarded when the tenders have been considered and the lowest ascertained. Correspondence was entered into with the proprietors of the work, before whom the objections of this Federation were laid, and who have promised to give due consideration to the views of the Federation.

A communication from the South Shields Association with reference to the question of subscription to be paid by firms embraced in the district was referred to the Executive Council for consideration.

The Sunderland Association reported that they had given notice of alteration to the bricklayers' and joiners working rules affecting winter working hours.

The Teesside Association reported that they had under consideration the question of the position of the sub-contractors, and were considering the draft form of sub-contract.

On the proposition of Mr. H. McNaughton, seconded by Mr. J. B. Wilson, it was decided to hold the next quarterly meeting at Middlesbrough, the date and time to be left in the hands of the president and secretary.

Mr. Easten then invited the representatives present from the Teesside and Sunderland Associations to be the guests of the Tyne and Blyth District Federation at their annual dinner, which was to be held immediately afterwards at the Royal Exchange, Grey Street, Newcastle-on-Tyne. Amidst applause, the hospitable invitation was accepted.

NATURAL ROCK ASPHALTE
(Compressed or Mastic)
For Horizontal and Vertical Damp Coursing
For Flat Roofs, Basements and other floors.
The French Asphalte Co., Ltd.
(ESTABLISHED 1871)
Supply only the best material from their own mine of St. Jean de Maruejols, combined with the best workmanship.
Complete satisfaction given to the leading Architects.
Apply for Prices:—
5, Laurence Pountney Hill, Cannon Street, E.C

X-PLASTER
THE MOST PERFECT SUBSTITUTE FOR KEENE'S
AT ALMOST THE PRICE OF LIME
ONE material only required for both render and finish
A PERFECTLY SANITARY FIREPROOF CEMENT
CLARK & CO.,
32a, WESTMINSTER PALACE GARDENS, S.W.
Works - - Newark-on-Trent, G.N.R.
Telegrams "Clarcolite. London." 'Phone: 5321 Wstminstr

THATCHING AND
REED LAYING.
J. G. COWELL, SOHAM.

LAUNDRY
and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE.
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

Space in these Columns can be reserved for advertisements of Firms who wish their announcements to appear opposite any Association Report. Prices are as follows:—

	Per Insertion.
Per inch	6 0
13 insertions	5 0

Firms entitled to the benefits of the Intertrading Clauses with Associations are especially invited to send announcements for these columns.

LOCAL ASSOCIATIONS AFFILIATED TO THE NORTHERN COUNTIES FEDERATION.

NEWCASTLE AND TYNE DISTRICT ASSOC.

Secretary: Wilton A. Rycroft, Accountant.

The trade in the Newcastle and Tyne district is very slack, and prospects for the year upon which we have just entered do not appear by any means good. One or two large contracts are to be carried out, the plans for which are still in the architect's hands, but there are not many of these, whilst speculative building is declining day by day.

The annual dinner of the Tyne and Blyth District Federation mentioned in my last report was duly held at the Royal Exchange, Grey Street, Newcastle-on-Tyne, when some 140 sat down.

This association has recently met a deputation from the operative carpenters and joiners' society in this district to consider the question of work which the members of that society claim should be done by themselves, but which in many cases is given to cabinet-makers. After considerable discussion it was agreed to take joint action in the matter, as it was felt that a great deal of the work referred to could be fully as well done by the members of the joiners' society as by cabinet-makers, whilst many of the builders had the plant and machinery necessary in the carrying out of such work. The joiners' contention that they were entitled to this class of work was also upheld.

At present we are busy preparatory to publishing a directory card of all members connected with the Association, as builders, merchants, or sub-traders, together with other information useful to the trade, which we trust will not only result in extending the operation of the inter-trading rule, but also in increasing to a large extent our membership.

NORTH SHIELDS, WHITLEY AND DISTRICT.

Secretary: John R. Hadaway, C.A.

The annual meeting of the North Shields, Whitley, and District Association was held on December 10, 1908, at 77, Howard Street, North Shields.

Mr. Joseph Pelton presided over a fair attendance of members. Mr. John R. Hadaway, C.A. (secretary) presented the annual report and statement of accounts, which were unanimously adopted.

The president congratulated the members upon the satisfactory state of the association's finances. He was also glad to say that the relations between the building trade employers and employees continued to be of a pacific character, and remarked that in spite of the prevailing slackness in trade no reduction had been made in the wages of the operatives. There had been clouds on the building trade horizon during the past year, but the only remaining one was lack of employment. Contracts were very few and far between, and competition was, in consequence, exceedingly keen.

A vote of thanks having been passed to the retiring officers, the election of officers for the ensuing year was then proceeded with, and resulted as follows:—President, Mr. Joseph Pelton (re-elected); vice-presidents, Messrs. J. T. Scott and W. S. Shepherd; representatives to the Northern Counties Federation, Messrs. Joseph Pelton, J. T. Scott, and J. F. Newbold; representatives to the Tyne and Blyth Federation, Messrs. W. S. Shepherd and J. G. Fell; auditor, Mr. George A. Leck.

The secretary reported that arrangements had been practically completed for the holding of the Tyne and Blyth Federation annual dinner, at the Royal Exchange, Newcastle, on January 17th, and that the mayors of the different towns and presidents of the National Federation, and of the Northern Architectural Association, had been invited.

A vote of thanks to Mr. Pelton for presiding brought the meeting to a close.

There is nothing to report from the following local associations affiliated to the Northern Counties Federation: Gateshead, Hartlepools, Middlesbrough, South Shields, Stockton-on-Tees, Sunderland, Teesside.

TYNE AND BLYTH DISTRICT BUILDING TRADES FEDERATION.

Secretary: W. H. Hope, Solicitor, Post Office Chambers, 14, Norfolk Street, Sunderland.

The Tyne and Blyth District Building Trades Federation held their annual dinner at the Royal Exchange, Grey Street, Newcastle-on-Tyne, on Thursday evening, December 17th, 1908. The president, Councillor Stephen Easten, was in the chair, and was supported by the Lord Mayor of Newcastle (Ald. J. J. Forster), the Sheriff of Newcastle (Councillor T. Rowe), the Mayor of Tynemouth (Councillor W. Hardie), Mr. J. Davidson (president of the Northern Counties Federation of Building Trades Employers), Mr. George T. Brown (president of the Northern Architectural Association), Mr. A. G. White (secretary of the National Federation of Building Trade Employers), etc., etc.

Mr. W. T. Weir proposed "The National Federation of Building Trade Employers." Mr. John W. White (honorary treasurer of that body) in response said that the creation of a National Conciliation Board had been one of the most successful things attempted by any trade in the country. Perhaps the President of the Board of Trade might take a lesson from the methods they had adopted in connection with the efforts he was making to bring about a cessation of strikes throughout the country. If the National Federation had done nothing else for the country, they had done a great deal in accomplishing that object.

Mr. A. G. White (secretary of the National Federation) also responded. He said that the Board of Trade statistics showed that they had turned the corner in the depression in the building trade. The workmen, he contended, had nothing to complain of in regard to the wages paid in the trade.

Mr. J. Davidson, president of the Northern Counties Federation, proposed "The Tyne and Blyth District Building Trades Federation." He claimed that the Federation had done a great deal for the masters, the workmen, and the architects. The builders had got conditions which they would not have obtained but for the National Federation, architects, he believed, would rather deal with men connected with the Federation than outsiders, so would the operatives.

The President (Councillor Easten) said that what the Federation aimed to do was to secure contracts that were fair and equitable to all parties concerned. They simply asked as builders for justice and no favour, to have the existing conditions so altered as to give them a fair right to ask for what was their own. At the present time they were unfortunately in the position of having on many occasions to take as a favour or as an act of grace what was their honest due. That was not a position they could suffer any longer. All they asked were conditions such as any business man would require as between man and man. At the present time they had conditions of contract that architects, solicitors, and town clerks considered only fools would sign. Their object was to remedy this, always considering the right of those they were working for. In his opinion, there was no more ridiculous position than that of employer or municipal body employing an architect who was their servant and employing that architect to be the sole arbitrator in the event not only of disputes between the employer and the contractor, but in cases of dispute between the architect and contractor.

Mr. W. Foster, president of the Newcastle Association, Mr. J. Simpson, president of the Blyth Association, Councillor J. T. Armstrong, president of the South Shields Association; and Mr. Joseph Pelton, president of the North Shields Association, also replied.

Mr. D. N. Brims gave the toast of "Our Municipal Authorities," and the Lord Mayor of Newcastle responded.

Mr. A. Ross gave "The Architects, Engineers, and Surveyors." Mr. Geo. T. Brown, F.R.I.B.A., President of the Northern Architectural Association, in responding, said that he also spoke on behalf of the surveyors and architects. With regard to the forms of contract used by public bodies, which the Federation was endeavouring to have superseded by the joint articles of agreement and general conditions of the Royal Institute of British Architects and the Builders' Institute, the principal difference between the two Forms of Contract, he said, was the arbitration clause. Under the old forms of contract the architect was sole arbitrator, and as such occupied a somewhat judicial position between the proprietor and builder, a position he thought he might say was somewhat difficult to fill, inasmuch as he—the architect—was paid by one of the two parties between whom he had to act, and he thought it said a good deal for the honour of his profession that this condition of things existed satisfactorily for so long, with rarely an exception. It was, however, the occasional exception which had rendered it necessary that builders should not be at the absolute mercy of the architect, and so the arbitration clause was introduced.

THE MIDLAND CENTRE OF THE NATIONAL FEDERATION.

Secretary: F. W. Amphlet, 58, New Street, Birmingham.

A meeting of the Midland Centre Conciliation Board was held at the Imperial Hotel, Birmingham, on Thursday, December 3rd last. Mr. John B. Whitehouse (Birmingham) presided, and most of the members of the Board, or their substitutes, were present. The meeting had been specially called to consider a dispute (mentioned in our last Federation reports) which the Birmingham Conciliation Board had been unable to settle. The question at issue was as to the rate of payment to a night gang of bricklayers employed by a Liverpool firm on the alterations to Messrs. Lewis's premises, Bull Street, Birmingham. The operatives contended that, in accordance with the working rules, overtime started after 6 p.m.. and should be paid for at the rate of time and a half. They also claimed that it was customary in Birmingham to pay night-gangs at the over time rate. The employers, in a letter read to the meeting, stated that they had explained to all the men, previous to engaging them, the conditions of work, namely, that they were to work the same number of hours during the night as the other men worked in the day, and were to receive the same rate of pay. After some discussion, the Board resolved *nem. con.* that the night gangs were working overtime in accordance with the Birmingham working rules, and were therefore entitled to payment at the rate of time and a half. The case was one that proved conclusively how impossible it is to frame working rules which (however carefully drawn up) will cover every possible contingency. There is nothing in the Birmingham working rules dealing specifically with the matter of night gangs, and this is the first time the question has arisen as to the rate of payment of such gangs.—Fred. W. Amphlet.

LOCAL ASSOCIATIONS AFFILIATED TO THE MIDLAND CENTRE.

BROMSGROVE AND DISTRICT ASSOCIATION.

Secretary: Sydney J. Brazier.

A meeting of the Bromsgrove and District Association was held on Saturday evening, December 12, 1908, Mr. W. Weaver presiding, with Mr. D. Edwards in the vice-chair. There was a good attendance of members.

It was decided to proceed with the formation of a local Conciliation Board, as the replies from the bricklayers', carpenters', and stonemasons' societies were all in favour of such a Board. Six members from this association were elected. The first meeting will probably take place on January 16th.

It was unanimously resolved to subscribe to the Builders' Journal.

BURTON-ON-TRENT AND DISTRICT ASSOCIATION.

Secretary: A. W. Chamberlain.

The quarterly general meeting of the Burton-on-Trent and District Building Trade Employers Association was held at the Station Hotel, Burton-on-Trent, on Tuesday, December 1, 1908, Alderman T. E. Lowe, J.P., in the chair.

Arising from the minutes the chairman stated that the operatives in Burton had expressed their satisfaction at the manner in which the masters' association has treated them in respect to their wages during the long and acute depression in trade.

The local branch of the Associated Ironmongers had written to the association pointing out the loss which master builders incurred by allowing tool hawkers from out-of-town firms visiting their workshops during working hours, and asking if the same indulgence could be allowed to local tool dealers. After considerable discussion, it was eventually decided that at builders' shops where the outside dealers are allowed to trade the same facilities shall in the future be accorded to the local traders.

The secretary read correspondence received from the Labour Co-partnership Association of London. It was resolved that the secretary communicate with this association and ask for details of the scheme relative to the building trade, and report to the next meeting.

It was resolved that the annual meeting and dinner be held on Saturday, January 30th.

It was resolved that this Association will do all in its power to promote the success of the Builders' Journal, and the secretary was instructed to canvas all the members with this object.

The secretary read his report of the proceedings of the Conference of National Secretaries, held in London in October last. After a discussion on the paper read to the conference by Mr. W. H. Hope, of Sunderland, on forms of contract, a vote of thanks was unanimously accorded Mr. Chamberlain for his report.

Mr. T. W. Selby gave a brief report of the proceedings of a meeting of the Midland Centre Conciliation Board he had attended in Birmingham, relating to the dispute at Leicester, on the question of walking time.

By the death of Mr. John Maddocks, which occurred on December 16th, the Burton-on-Trent Building Trade Employers' Association lost its oldest member. Mr. Maddocks, who was in his 78th year, had held the office of treasurer to the association. The funeral took place at Burton Cemetery on Saturday, December 19th, and was attended by several representatives of the Burton Master Builders' Association.

There is nothing to report from the following local associations affiliated to the Midland Centre: Birmingham, Coventry, Derby, Dudley, King's Norton, Leamington, Leicester, Long Eaton, Loughborough, Mansfield, Newark, Northampton, North Staffordshire, Nottingham, Nuneaton, Redditch, Stafford, Stourbridge, Walsall, West Bromwich, Wolverhampton, Worcester.

THE SOUTH-EASTERN CENTRE OF THE NATIONAL FEDERATION.

COMPOSED OF

The London Federation, The Southern Counties Federation, and The Eastern Counties Federation.

Secretary : T. COSTIGAN, 31 & 32, Bedford Street, Strand, London, W.C.

THE LONDON FEDERATION.

Secretary : T. COSTIGAN, 31 & 32, Bedford Street, Strand, London, W.C.

The following meetings of the London Master Builders' Association have been held since the last report: Office Premises Committee; Finance Committee, and Council—all on December 17th.

The Council received and adopted the reports of the Office Premises and Finance Committees.

Correspondence re the Colchester Asylum was considered.

A report of the Westminster Police Court proceedings re the workmen's overtime was ordered to be placed on the minutes.

Instructions were given with respect to the annual audit and the Association annual dinner.

THE SOUTHERN COUNTIES FEDERATION.

Secretary : T. COSTIGAN, 31 and 32, Bedford Street, Strand, London, W.C.

LOCAL ASSOCIATIONS AFFILIATED TO THE SOUTHERN COUNTIES FEDERATION.

SOUTHAMPTON AND DISTRICT ASSOCIATION.

Hon. Secretary: A. T. Doggrell.

At the meeting held at the Royal Hotel, Southampton, on Wednesday, December 30, 1908, the attendance owing to the Arctic weather was smaller than usual, but some important business was transacted.

Several important alterations in working rules, including a reduction of wages and alteration of working hours, were discussed and agreed to, the new rules to come into force on May 1st, 1909, and due notices were sent to the men's representatives. The date of the annual general meeting was fixed for January 30th, when several important matters are expected to come up for discussion.

There is nothing to report from the South-Eastern Centre, nor from the Southern Counties Federation, nor from the following local associations affiliated to the Southern Counties Federation: Brighton, Chatham, Gravesend, Maidstone, Portsmouth.

THE EASTERN COUNTIES FEDERATION.

LOCAL ASSOCIATIONS AFFILIATED TO THE EASTERN COUNTIES FEDERATION.

GREAT YARMOUTH ASSOCIATION.

Secretary: R. J. Hill.

A committee meeting of the Great Yarmouth Association was held on November 24th, 1908, to consider the advisability of amending the rules, but was so sparsely attended that it was thought advisable to postpone the discussion.

At the general monthly meeting, held at the Crown and Anchor Hotel, on December 1st, only five members attended. The minutes of the last monthly meeting and committee meeting having been read the president suggested that certain remarks he had made with reference to the painstaking manner in which the secretary always performed the work of the association ought not to have been omitted. Other members agreeing, the minutes were amended accordingly.

One new member was elected, and the membership now stands at 47.

There is nothing to report from the Eastern Counties Federation, nor from the following local associations affiliated to it: Cambridge, Norwich.

THE SOUTH-WESTERN CENTRE OF THE NATIONAL FEDERATION.

COMPOSED OF

The South-Western Federation, and The South Wales Federation.

Secretary : W. F. LONG, 3, Northumberland Buildings, Bath.

LOCAL ASSOCIATIONS AFFILIATED TO THE SOUTH-WESTERN FEDERATION.

BRISTOL ASSOCIATION.

Secretary: A. J. Pitt.

The ordinary monthly meeting of the Bristol Association was held on December 17th, when Mr. Frank N. Cowlin occupied the chair.

A letter was read from Mr. A. G. White, secretary of the National Federation, acknowledging receipts of this association's communication suggesting the amendment of clause 20 of the National Form of Contract, and promising to bring same before the Emergency Committee of the Federation.

A communication was read from the Town Clerk of Bristol in regard to Rule 1 of the working rules, which provides that the hours of labour shall be from 6 or 6.30, or 8 or 8.30 until 5 p.m., and asking whether this was to be read that an employer was entitled to open his works at 6.30 or 8.30 as the case may be, as, in his opinion, the reading of this rule was rather indefinite. The president said that undoubtedly it was rather vague, but it was understood throughout the district that the hour for commencing work was 6 or 8 a.m., according to the season of the year, and that the half-hour was only inserted to meet the case of a workman who may be a few minutes late in getting to his work. He thought, however, that in order to make the reading of the rule beyond question, it would be well to approach the operatives as to deleting the 6.30 or 8.30 wherever they occurred in the rule. This was agreed to.

The following members were elected as representatives of the Association on the South-Western Federation: Messrs. F. Chown, J. Lovell, George Humphreys, E. I. Neale and Audley Perkins.

The hon. treasurer was authorised to pay the subscription to the South-Western Federation.

Arising out of a small collection made by the hon. treasurer as a Christmas gift for an old builder who had fallen upon hard times, the president said he should like to see a benevolent society formed in connection with the association, so that they might be able to extend a helping hand to any of their members who, in these strenuous times, had fallen by the wayside.

This suggestion was heartily endorsed by the members present, and it was resolved to give further consideration to the matter at an early date.

There is nothing to report from the South-Western Centre, nor from the South-Western Federation, nor from the following local associations affiliated to the South-Western Federation: Bath, Bridgwater, Cheltenham, Exeter, Gloucester, Hereford, Stroud, Taunton.

THE SOUTH WALES FEDERATION.

Secretary : W H. BILLINGS, Salubrious Chambers, Swansea.

There is nothing to report from the South Wales Federation, nor from the following local associations affiliated to it: Cardiff, Newport, Pontypridd, Swansea.

SCOTTISH BUILDING TRADES FEDERATION.

Secretary : JAMES CAMERON, Solicitor, 61, Lothian Road, Edinburgh.

There is nothing to report from the Scottish Building Trades Federation, nor from the following associations affiliated to that association: Aberdeen, Alloa, Dingwall, Dumfries, Dundee, Edinburgh, Leith, and District, Hawick, Inverness, Keith, Kilmarnock, Oban, Paisley, Perth.

LONDON—
JAMES BROWN (LONDON), LTD.,
MAKE THE BEST
HOLLOW POROUS BRICK PARTITIONS
In 1½ in., 2½ in., 3 in. and 4 in. thicknesses.
Takes a Nail Perfectly
ESSEX WHARF, WHITECHAPEL, E.
—— Telephone, 9513 Central. ——

BEFORE SELECTING
Stoves, Ranges, Chimney Pieces, Tiles, Baths
Door Handles, and Fastenings, &c,
Visit the Extensive Showrooms of
HOWARD W. MEREDITH,
68, York Rd., Lambeth, S.E.
(Opposite Waterloo Station.)

Telephone, No. 1062 HOLBORN.
Contractors to H.M. Government, &c.
THE PERFECT TILE CO.,
13 & 15, Featherstone Buildings,
Holborn, LONDON, W.C.
OPAL WALL TILES. GLAZED WALL TILES.
Tessellated and other Floor Tiles.
Terrazzo and Cube Mosaics to any Design.
Fireproof Partitions. Fireproof Jointless Floors
AGENT FOR "MODERNIA" GLASS TILES.

T.A.—"DESICCATOR, LONDON." Tel.—2663 Avenue
Established 1854.
STEPHINGS, SON & BYERS,
Timber Merchants. Desiccating Works,
Sawing aud Planing Mills.
ADELINA GROVE, MILE END, LONDON.
Speciality ; DESICCATED OAK FLOORING

THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs,
Premier Ironworks,
DEPTFORD, S.E.

BUILDING . BOOKS . AT
GREAT REDUCTIONS ! !
New Books at 25 per cent. Discount.
Books on Building, Architecture, Surveying, Estimating, Technical, all other Subjects and for all Examinations Supplied. Sent on Approval. State Wants. Catalogues Free.
BOOKS PURCHASED.
R. P. FOYLE, 135, Charing Cross Road, London, W. C

LIGHTNING CONDUCTORS
Supplied, Erected and Tested. Chimney Shafts Restored, &c.
J. LEWIS, 5 & 6, Great Winchester Street LONDON, E.C.
TELEPHONE No. 3053 CENTRAL.

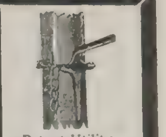
Send for Prices and Particulars of
FRAZZI FIREPROOF
FLOORS & PARTITIONS.
Frazzi Fireproof Construction, Ltd.,
Essfix Wharf, Durward Street,
WHITECHAPEL.

Reduce your Wages by using
BROOM & WADE'S
PATENT HOIST.

This is the most Efficient Hoist on the market for hoisting barrows of bricks, concrete, &c., without Gearing.

BROOM & WADE, LTD.,
Engineers, HIGH WYCOMBE.

'SCAFFIXER'
Block.



Patent Utility
Scaffolding Bracket

REVOLUTIONISES SCAFFOLD FIXING.
Supersedes the Scaffold Cord and Wedge. Practically Indestructible. Never Slackens or Slips.
FIXED IN ONE MINUTE.
RELEASED INSTANTLY.
D. P. JONES' Patent Rapid
SCAFFOLDING BLOCK
Now in use at the
LONDON COAL EXCHANGE,
BILLINGSGATE, E.C.
Inspection Invited.
CALL & SEE IT.
Write for particulars and PHOTOGRAPHS to
—THE—
PATENT RAPID SCAFFOLDING
& APPLIANCES SUPPLY CO.,
287, Upper Richmond Rd., Putney, S.W.

Used as Ledger
and Standard Tie.

Used as Single
or Band Tie.

PEIRSON & Co
ST DUNSTAN'S HILL
LONDON, E.C.
& WANSTEAD WORKS

Telegrams "ALLEGRETTO, LONDON."
Telephone, 5951 AVENUE.

Copy of our HANDBOOK 1907. gratis

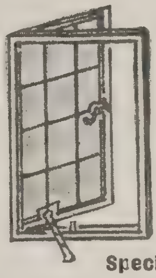
FIRE ESCAPE
STAIRCASES
COMPLETE - TO LOCAL AUTHORITIES REQUIREMENTS

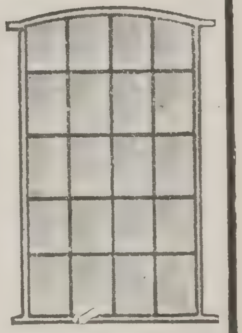
CONSTRUCTIONAL ENGINEERS

REA METAL CASEMENTS, LTD.,
Stanley,
Liverpool.

Manufacturers of
METAL WINDOWS
for every class of
BUILDING.
Leaded Lights, &c.

Telegrams: "ENLIGHTEN."
Telephone, 365 OLD SWAN
Special Quotations on receipt of particulars.





Practical Notes for Architectural Draughtsmen.

By ALFRED W. S. CROSS, M.A., F.R.I.B.A.,
and ALAN E. MUNBY, M.A., A.R.I.B.A.

Complete Set Now Ready (27 Large Plates in a Portfolio), 12s.
POST FREE, 12s. 6d.

Prof. C. H. REILLY, of Liverpool University, says: "I think it is a very valuable book, and I hope it will find its way into most architectural offices."

THE "PRACTICAL NOTES" gives in most convenient form for use on the drawing board examples with concise rules, explanations and dimensions for preparing Designs, Perspectives and Working Drawings for Classical Architecture with rapidity and precision.

STUDENTS preparing for the examinations of the R.I.B.A. can learn how to draw The Orders correctly with the smallest possible amount of study and work by utilising the invaluable drawings and data given in this publication.

THE MANAGER, TECHNICAL JOURNALS, LTD.,
Caxton House, Westminster, S.W.
Descriptive Leaflet sent Post Free upon Application.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - - -	3s. 0d.

*This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bushbury (Staffs.).—Accepted for erection of a Council school in Bushbury Lane, for the Staffordshire Education Committee:—

F. J. Tooley, Wolverhampton, £3,673; for installation of heating apparatus: W. H. Manley and Co., Penn Road, Wolverhampton, £192.

Dunham Massey (Cheshire).—Accepted for new isolation hospital, Sunderland Road, for Altrincham Urban District Council. Mr. Wm. Owen, A.R.I.B.A., Duchy Chambers, Clarence Street, Manchester:—M. Stone and Sons, Altrincham, £8,700.

Hitchin.—Improvements scheme in connection with the new waterworks. Contract A. Accepted for supply, delivery and erection of a steel tank of 98,000 gallons' capacity, and girder floor, and supply, delivery and laying about 1,200 yds. of 9 in., 6 in., and 4 in. cast iron water mains, with sluice and reflux valves and hydrants.

Sir John Aird and Co., London, £1,595 18s. 9d.

Contract B.—Accepted for construction of water tower 42 ft. high and service reservoir of 300,000 gallons capacity, and valve chambers.

W. French, Hitchin, £2,229 10s.

Contract C.—Accepted for supply, delivery and laying about 2,000 yds. 12 in. C.I. syphon main, 700 yds. 9 in. C.I. pumping main, and 2,700 yds 12 in., 9 in., 8 in., 6 in., 4 in., and 3 in. distributing mains and junctions, with hydrants, etc.

Sir John Aird and Co., London, £3,327 11s.

Solihull.—For the erection of a new isolation hospital, for the Solihull and Meriden Joint Council. Messrs. W. H. Ward, architects, Paradise Street, Birmingham:—

Tilt Bros., Bromsgrove	... £9,999
W. J. Bloxham, Banbury ...	... 9,742
W. Jackson, Langley Green ...	... 9,400
Thos. Rowbotham, Birmingham	... 9,337
W. and J. Webb, Birmingham	... 9,309
Geo. Robinson, Birmingham ...	... 9,286
H. Dorse, Cradley Heath ...	... 9,175
Geo. Webb and Son, Birmingham ...	9,138
C. A. Horton, Staffordshire ...	... 9,138
Francis H. Smith, Birmingham	... 8,997
S. F. Swift, Birmingham ...	... 8,990
Bragg Bros., Solihull	... 8,850
Wm. Sapcote and Sons, Birmingham	8,838
William Bishop, King's Heath ...	8,737
Thos. Hickman, Market Harborough	8,729
W. Harvey Gibbs, Birmingham ...	8,700
W. Pattinson and Sons, London ...	8,596
John Dallow and Sons, Blackheath	8,530
T. and W. Thompson, Solihull... ...	8,499
Henry Gregory,* Olton	8,240

*Accepted.

For the supply of valves, floating arms, etc.:—

Adams and Co., London	£168	14	6
Ham, Baker and Co., London ...	166	7	0
Farrer,* Birmingham	145	0	0

For the supply and fixing of 35 b.h.p. gas-engine, ejector, compressor, etc.:—

Hughes and Lancaster,* Westminster £840

*Accepted.

Woolwich.—For erection of a police station at Woolwich. Mr. J. D. Butler, F.R.I.B.A., architect, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son and Chidgey, 8, Adelphi Terrace, Strand, W.C.:—

C. Ansell	... £13,944	0	0
Graham and Co. ...	... 12,540	0	0
W. F. Blay, Ltd.	... 12,060	0	0
F. G. Minter	... 11,992	0	0
Gunning and Sons ...	... 11,933	10	0
Higgs and Hill, Ltd. ...	... 11,844	0	0
Appleby and Sons ...	... 11,727	0	0
Thomas and Edge ...	... 11,717	0	0
Holland and Hannen ...	... 11,666	0	0
Holloway Bros. (London), Ltd	11,652	0	0
F. and H. F. Higgs ...	... 11,555	0	0
Mowlem and Co., Ltd.	... 11,547	0	0
H. Kent	... 11,470	0	0
Grover and Son ...	... 11,363	0	0

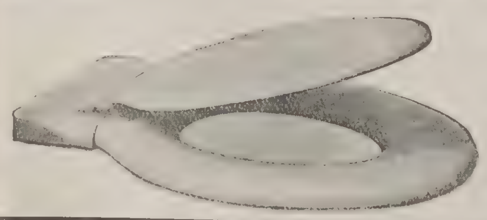
Yiewsley (Middlesex).—For new Council school, for the Middlesex County Council. Mr. H. G. Crothall, architect to the Middlesex Education Committee:—

E. Lawrance and Son ...	... £5,648	0	0
W. J. Renshaw	... 5,491	0	0
Tribe and Co., Ltd. ...	... 5,353	0	0
W. Lawrence and Son ...	... 5,280	0	0
J. Stewart	... 5,236	0	0
F. G. Minter	... 5,215	0	0
Knight and Son	... 5,200	0	0
A. and B. Hanson ...	... 5,185	13	4
Fassnidge and Son ...	... 5,109	0	0
J. Dorey and Co.	... 5,100	0	0
T. J. Hawkins and Co. ...	... 5,058	0	0
C. F. Kearley	... 4,986	0	0
W. Lacey	... 4,975	0	0
W. J. Dickens,* Ealing	... 4,928	0	0

*Recommended for acceptance.

(*Tenders continued on page viii.*)

"LIMPET" PATENT BOLTS & WASHERS
FOR CORRUGATED IRON SHEETS.
"There is no doubt in our mind that they ought to be regularly specified where iron sheeting is used."—Vide BUILDERS' JOURNAL.
PRICE'S PATENT
The latest and most approved Fixing for joining Corrugated Iron Sheeting together.
REGISTERED TRADE MARK
LIMPET
Their great feature is the way in which they adjust themselves to the corrugation and make an absolutely watertight joint. They also retard the corrosive action in Galvanized Sheets and combine other advantages.
EXCLUSIVELY ADOPTED BY THE INDIAN GOVERNMENT, THE LEADING RAILWAYS AND MANY OF THE LARGEST MANUFACTURING CONCERNS IN ENGLAND AND THE COLONIES.
Full particulars and samples from the Managing Agents—
WILLIAM JACKS & CO., 5, East India Ave LONDON, E.C.
Agents for Scotland: Frank G. Price & Co. 53, Waterloo St., Glasgow.



SANITARY SEATS.
INDENTS THROUGH SHIPPERS.
EAST BROTHERS,
Lochee Cabinet Factory,
DUNDEE, SCOTLAND.
THISTLE (REGD) BRITISH MANUFACTURE

TILES. MOSAICS. FAIENCE.
CRAVEN DUNNILL & CO., LTD.,
Jackfield, S.O., Shropshire.
ENAMELS. LUSTRES. WALLS.

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork.

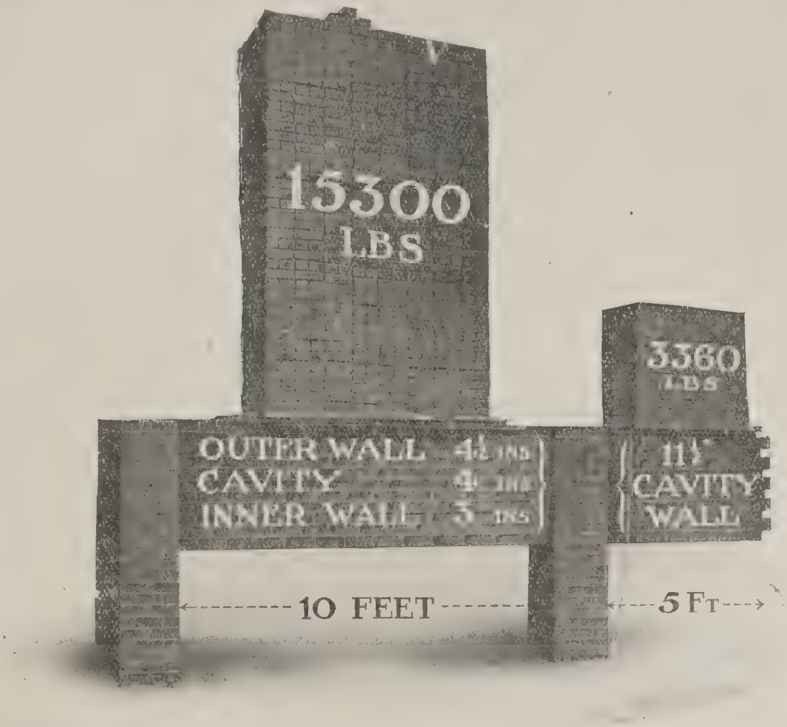
H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

RD. JOHNSON CLAPHAM, & MORRIS, Ltd.,



Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered
Soundproof,
Fireproof
Dampproof,

Architects, Builders, and Contractors

Write for Descriptive Catalogue.

Engineering Department,
24, Lever Street,
MANCHESTER.

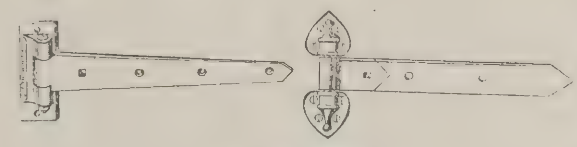
Telegrams;
"Metallicus, Manchester."

Hollow Wall and Cantilever constructed of 4½-in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

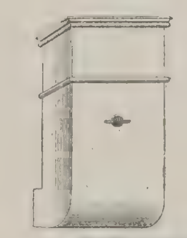
Telephone:
6437 Manchester.

IRONWORK FOR COUNCIL SCHOOLS

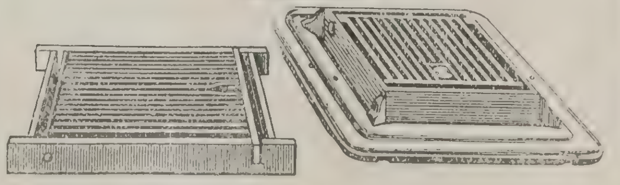
GENERAL BUILDERS' IRONWORK.



GATES . . and . . . RAILINGS.



TOBIN TUBES and GULLY GRATES.



PATENT HAT AND COAT RAILS.

CLARK, HUNT & CO., Ltd., ***Middlesex Ironworks,*** **Shoreditch, London.**

GENERAL CATALOGUE ON APPLICATION.

(Tenders continued from page vi.)

Henley-on-Thames.—For erection of new receiving wards, mortuary, and remodelling to part of the workhouse at Henley-on-Thames, for the Guardians. Messrs. Charles Smith and Son, architects, 164, Friar Street, Reading :—

H. W. Godwin, 10, Church Street, Reading	£1,997
T. Stimson and Sons, Wokingham	1,815
F. Newberry, Reading	1,795
Jenkins and Son, Ltd., Southampton	1,784
W. J. Bloxham, Banbury	1,776
C. H. Hunt and Son, High Wycombe	1,751
W. J. Fryer and Co., Paddington	1,698
Buller Bros., Henley-on-Thames	1,669
C. Aldridge, Reading	1,656
Walden and Son, Henley-on-Thames	1,624
T. H. Kingerlee and Sons, Oxford	1,619
Tydeman Bros., Swindon	1,600
A. J. Cobborne, Swindon	1,598
G. Henson and Son, Wellingboro'	1,566
McC. E. Fitt, Reading	1,562
G. S. Lewis and Bro., Reading	1,550
E. C. Hughes, Wokingham, Berks.	1,499
G. H. Gibson, High Wycombe	1,486
W. Creed, Maidenhead	1,350

Leyton (Essex).—For new school buildings, Lybourn Street, Leyton, for the Leyton Urban District Council. Mr. W. Jacques, A.R.I.B.A., architect, 2, Fen Court, E.C. Quantities by Messrs. J. Rider Hunt and Co., 181, Queen Victoria Street, E.C. :—

Johnson and Co.	£13,205
B. King and Son	12,258
Appleby	11,900
Spencer, Santo and Co.	11,709
F. and G. Foster	11,541
Harewill	11,502
J. and J. Dene	11,470
Rawley Bros.	11,465
McCormick	11,421
A. W. Coles	11,368
Lowe and Co.	11,335
Brand, Pettet and Co.	11,309
Hyde and Co.	11,198
J. W. Jerram	11,154
North Bros.	11,139
A. E. Symes	11,086
Patman and Fotheringham	11,049
B. E. Nightingale	11,029
H. J. Carter	11,016
W. J. Maddison	10,922
Keate and Randall	10,896
Henson and Son	10,820
J. and E. Davey	10,685
F. J. Coxhead*	10,647

*Accepted.

Liverpool.—Recommended for acceptance, for erection and completion of manager's house and office, gaswork buildings and gas plant foundations, and gasholder tank at Fazakerley, for the Liverpool City Council.

R. Costain and Sons, 57, Moorfields, Liverpool, £3,114 3s. 3d.

Padiham, near Burnley.—For the erection of a new elementary school at Padiham, near Burnley, to accommodate 620 scholars, for the Lancashire Education Committee :—

Mullin and Durkin, Burnley	£8,031	0	0
J. Tinline, Bury	7,944	0	0
M. and J. W. Heap, Burnley	7,930	3	6
T. Pickles, Luddendenfoot	7,925	0	0
B. Lumb,* Todmorden	7,616	0	0

*Recommended for acceptance.

Ravenfield (Yorks.).—For erection of a new school at Ravenfield, for the West Riding Education Committee. Mr. James Totty, architect, Moorgate Street, Rotherham :—

W. R. Unwin, Ecclesfield, Sheffield	£2,198	0	0
W. Marlow and Son, Hillsbrough, Sheffield	2,176	0	0
R. Snell, Masbrough	2,140	0	0
Chadwick and Co., Ratherham	2,003	0	0
W. H. Trehern, Rotherham	1,852	7	9
W. M. Beeden,* Thrybergh, near Rotherham	1,766	15	10

*Accepted.

Cwmfelinfach (Mon.).—For erection of seventeen houses on the Maindee Road, for the Trustees of the Pioneer Building Club. Mr. J. W. Aldiss, architect and surveyor, Newbridge, Mon. :—

S. Edwards	£4,049	10	0
H. Williams and Co.	4,037	10	0
H. J. Herbert and Co.	3,700	0	0
T. James	3,663	10	0
W. Phillips, Ynysddu, Mon.*	3,655	0	0
A. J. Bell	3,100	0	0

*Accepted.

Hanley.—For the erection of new shop premises, Market Square, Hanley, and for alterations to the existing premises, for Messrs. M. Huntbach and Co., Ltd. Messrs. R. Scrivener and Sons, architects, etc., Hanley :—

Tompkinson and Betteley	£3,391
C. Cornes and Son	3,317
W. Grant and Sons	3,315
G. Ellis	3,285
T. Godwin * Hanley	3,037

*Accepted.

Northampton.—For erection of a new isolation hospital at Berrywood Asylum, for the Committee of Visitors of the Northamptonshire County Council. Mr. W. B. Partington, surveyor of works, Berrywood, Northampton. Quantities by surveyor :

R. Carlyle	£2,903	0	0
T. Higgs	2,897	0	0
R. Cosford	2,849	0	0
W. Higgins	2,718	0	0
E. D. Sharman and Son	2,700	0	0
G. F. Sharman	2,698	0	0
A. P. Hawtin	2,674	0	0
A. J. Chown	2,663	0	0
E. Green	2,637	0	0
J. Martin	2,570	0	0
T. Hickman	2,560	0	0
W. Heap	2,497	0	0
W. W. Webster	2,487	15	0
G. L. Fisher	2,342	0	0
W. W. Roberts and Co., Ltd.,* Weedon	2,285	10	0

*Accepted.

Aberdeen.—Accepted for additions and alterations to be made at the City Hospital, Aberdeen, for the Town Council :—

Leslie, Smith and Son, masons	£4,773	0	0
G. Jamieson, carpenter	3,000	0	0
J. Blinkie and Sons, plumbers	1,682	0	0
J. Bunnochie and Sons, plasterers	915	1	0
J. Blinkie and Sons, heating engineers	658	10	0
Gordan and Watt, painters	498	0	0
C. Maitland and Son, slaters	361	0	0
J. Sangster, ironworkers	123	18	6

Architect's estimate, £12,000.

Northern Polytechnic Architectural and Building Students' Association.

The seventh annual dinner of this association was held at the Covent Garden Hotel last month. Mr. Henry T. Hare, F.R.I.B.A., who presided, was supported by Alderman Smallwood and Mr. Hugh Davies (president of the association, and head of the architectural and building trades department of the institute). Mr. Hare said that for some years he had been very much interested in the promotion and establishment of classes in connection with his own profession of architecture, and any institution which had for its object the furthering of technical education and especially the training of students of all branches of the building trade, had his heartiest sympathy. There had been, however, cases in which youths who, having had a course of training at a technical school, had gone forth representing themselves as full-flown architects. This he regarded as a great pity.

THE HATHERN STATION BRICK & TERRA COTTA COMPANY, Ltd.,

Supplied the Terra Cotta for this Building.

WORKS & OFFICES

Hathern Station

Loughborough.

Blue Brick Makers

CLIFF WORKS,
TAMWORTH,
STAFFORDSHIRE.

(See our fortnightly picture of building.)

Co-operative Insurance Co,'s. Offices, Manchester.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Jan. 14. TALYBONT.—Erection of a house at Talybont, Cardiganshire, for D. Williams. Plans and specification may be obtained on application to G. T. Bassett, A.R.I.B.A., architect and surveyor, Aberystwyth, to whom tenders should be delivered by Jan. 14.

January 14. DARLASTON.—Erection and completion of a handicraft centre at Darlaston (on the site of the Central Council School), for the Staffordshire Education Committee. Builders desirous of tendering should apply to G. Balfour, Director of Education, County Education Offices, Stafford, on or before Jan. 14. Quantities will be supplied upon receipt of a deposit of 10s. 6d., which should accompany the application to tender.

Jan. 14. EDINBURGH.—Unclimbable fencing at Balgreen Road, Saughton Park, according to plans and specification, which may be seen at the Public Works Office, where also schedules of quantities may be had on personal application. The estimates must be sent addressed to J. A. Williamson, city superintendent of works, Public Works Office, City Chambers, Edinburgh, by 10 a.m. on Jan. 14, sealed and marked "Tender for Fencing, Saughton Park."

Jan. 15. BIRKENHEAD.—Erection and completion of extensions to the infectious diseases hospital, Flaybrick Hill, for the Birkenhead Corporation. Plans, specification and particulars can be seen, and bills of quantities and form of tender obtained on application at the office of C. Brownridge, borough engineer and surveyor, upon a deposit of the sum of £1 1s. Fair wages clause. Securities required. Tenders, upon the printed form supplied, sealed and endorsed "Tender for Extensions, Infectious Diseases Hospital," to be sent to J. Fearnley, town clerk, Town Hall, Birkenhead, not later than 4 p.m. on Jan. 15.

Jan. 15. CWMPARK.—Extensions, formation, and enclosing of new playground, and painting and colouring at the Park Council School, Cwmpark, for the Rhondda U.D.C. Plans and specification may be seen and bills of quantities and tender form obtained at the office of J. Rees, architect, Hillside Cottage, Pentre, upon the production of a receipt from the accountant of the Council for the required deposit of £1 1s. Sealed tenders, endorsed "Tender for Extensions, etc., at Park School," accompanied by the priced quantities, under separate cover, duly endorsed, must be delivered before noon on Jan. 15, at the Council Offices, Pentre, addressed to the chairman of the Building Committee.

Jan. 16. BLAENPLWYF.—Erection of a house at New Inn, Blaenplwyf, for T. Jenkins. Plans and specification may be obtained on application to G. T. Bassett, A.R.I.B.A., architect and surveyor, Aberystwyth, to whom tenders should be delivered by Jan. 16.

Jan. 16. HALE.—Erection of Altrincham Higher Elementary School, Queen's Road, Hale, Cheshire. Contractors desirous of tendering are invited to send in their names to J. Howarth, clerk to the committee, Education Offices, Market Street, Altrincham, not later than Jan. 16, with the sum of £2 2s.

Jan. 16. BOWDON LODGE.—Erection of Altrincham County High School for Girls, Bowdon Lodge, Cheshire. Contractors desirous of tendering are invited to send in their names to J. Howarth, clerk to the committee, Education Offices, Market Street, Altrincham, not later than Jan. 16, together with the sum of £2 2s.

Jan. 16. DORE.—Erection of two detached villas, at Dore. Builders desirous of tendering are requested to apply for bills of quantities not later than Jan. 16, after which date plans and conditions of contract may be seen at the office of J. W. Winter, architect, surveyor and valuer, St. Peter's Close, York Street, Sheffield.

Jan. 16. CHEPSTOW. — Repairs to playgrounds, road, and other works at the Chepstow Boys' Council School and Chepstow Girls' and Infants' Council School. Plans and specification may be seen at the offices of C. Dauncey, secretary, County Council Offices, Newport, Mon., to whom sealed and endorsed tenders, in separate envelopes for each school, are to be delivered on or before Jan. 16.

Jan. 16. HOUGHTON-LE-SPRING.—Construction of an underground public convenience in Newbottle Street, near the Council Offices, for the U.D.C. Plans and specifications may (by appointment) be seen and all particulars obtained, together with form of tender, at the office of the surveyor of the Council, Newbottle Street, Houghton-le-Spring. Securities required. Tenders, endorsed "Tender for Public Convenience," must be delivered to D. Miller, clerk of the Council, Houghton-le-Spring, not later than Jan. 16.

Jan. 18. EAST STONEHOUSE.—Adapting part of the constable's house at Devil Point, East Stonehouse, for the purpose of a public convenience, for the U.D.C. Persons wishing to tender for the work, are requested to send their names to C. H. Trounce, surveyor, surveyor's department, Town Hall, Stonehouse, Devon.

Jan. 18. ECCLES.—Erection of houses in Corporation Road, Eccles, for the Corporation. A copy of the bill of quantities and general conditions may be obtained at the town clerk's office, on depositing the sum of £1 1s. The plans may be inspected and further particulars obtained at the office of L. Barlow, architect, 8, King Street, Manchester. Tenders, endorsed "Tender for Houses," to be delivered to E. Parkes, town clerk, Town Hall, Eccles, in the official envelope provided, not later than 10 a.m. on Jan. 18.

Jan. 18. LONDON, E.—Erection of a residence for the medical officer upon the Isolation Hospital site at Boundary Road, East Ham, in accordance with drawings and specifications which may be obtained on application to A. H. Campbell, borough engineer, Town Hall, East Ham, E. The persons tendering are required to deposit a cheque or Bank of England note for the sum of £5. Tenders are to be forwarded enclosed in an envelope duly sealed and addressed to "The Worshipful the Mayor, Town Hall, East Ham, E.," and endorsed "Residence for Medical Officer," not later than 12 o'clock noon, Jan. 18. Fair wages clause.

Jan. 19. THRYBERGH.—Erection of working men's club, Thrybergh, near Rotherham. Plans may be seen and quantities obtained at 14, Regent Street, Barnsley, to Jan. 19, on which date sealed and endorsed tenders are to be delivered at the aforementioned address.

Jan. 19. PLYMOUTH.—Providing and fixing two ventilators and new skylight in the roof of the kitchen at the workhouse; also for the provision of a mortuary slab, with necessary accessories, for the Guardians of the Poor. Specifications may be obtained between the hours of 10 a.m. and 4 p.m. at the clerk's office. Tenders, endorsed "Tender for skylight, ventilator, etc.," must be sent to W. Adams, clerk to the guardians, 13, Princess Square, Plymouth, not later than 12 noon on Jan. 19.

Jan. 20. TAUNTON.—Erection of a covered playground, changing room, bathroom, box-room, etc., for the Council of Taunton School. The plans and specification may be seen, and bills of quantities obtained at the architect's office. Sealed tenders, upon the form supplied, addressed to F. W. Roberts, architect, 2, Hammet Street, Taunton, and endorsed "Tender for Taunton School," must be delivered on or before noon on Jan. 20.

Jan. 20. COLLINSTOWN.—Carrying out additions and alterations to Collinstown Church, Co. Westmeath, according to the plans and specification, which may be seen at the Parochial House, Collinstown, or at the office of L. O'Callaghan, architect, 31, South Frederick Street, Dublin. Tenders, endorsed "Tender for Alterations and Additions, Collinstown Church," and addressed to the Rev. N. Woods, Adm., to be delivered at the Parochial House, Collinstown, not later than 5 p.m. on Jan. 20.

Jan. 22. ILFRACOMBE.—Erection of a new post-office at Ilfracombe, for the Commissioners of H.M. Works and Public Buildings. Drawings, specification and a copy of the conditions and form of contract may be seen on application at the present post-office. Bills of quantities and forms of tender may be obtained at the undermentioned address on payment of £1 1s. Tenders must be delivered before 12 o'clock noon on Jan. 22, addressed to the Secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., and endorsed "Tender for Ilfracombe New Post-Office."

Jan. 23. MANCHESTER.—Erection of the new Municipal Secondary School for girls in Chorlton Street, for the Education Committee. Plans may be seen and a copy of the bills of quantities (including specification) may be obtained at the Elementary Education Office, Deansgate, Manchester, on a deposit of £3 3s. (cheques to be made payable to the Accountant). Tenders on the forms provided, addressed to "The Chairman of the Education Committee," must be delivered at the School of Technology before noon on Jan. 23.

Jan. 25. LITHERLAND.—Erection of a cookery and laundry centre at Lander Road Council school, Litherland, for the Lancs. Education Committee. The plans may be seen and bills of quantities obtained at the office of H. Littler, county architect, 16, Ribblesdale Place, Preston, by payment of a deposit of £2. Tenders must be delivered before 12 o'clock noon on Jan. 25, sealed and endorsed, to J. Dean, 22, Lord Street, Liverpool.

Jan. 25. SACRISTON.—Erection and completion of new workmen's club at Sacriston, Co. Durham. Drawings, specifications, and conditions of contract may be seen and forms of tender may be obtained at the architect's office, 22, Durham Road, Blackhill, Co. Durham. Tenders to be sent in to R. Herbert, secretary, Workmen's Club, Sacriston, Co. Durham, not later than Jan. 25, duly endorsed as above.

January 26. LONDON, N.—Supply and erection of open pale oak fencing at Finsbury Park, N., for the L.C.C. Persons desiring to submit tenders may inspect the drawing and obtain the specification, form of tender, and other particulars at the Parks Department, 11, Regent Street, S.W. Tenders must be upon the official forms, and the printed instructions contained therein must be strictly complied with. Fair wages clause. Each tender is to be delivered at the County Hall, in a sealed cover addressed to the clerk of the L.C.C., Spring Gardens, S.W., and marked "Tender for Oak Fencing, Finsbury Park." No tender received after 11 a.m. on Jan. 26 will be considered.

Jan. 27. PORTSMOUTH.—Erection of quarters for assistant medical officers, medical officers' residence, and an extension of the Nurses' Home at the Workhouse Infirmary at Milton, Portsmouth, for the Guardians of the Poor. Fair wages clause. Local contractors only will be allowed to tender. The drawings and specifications may be inspected at the offices of Rake and Cogswell, architects, Prudential Buildings, Commercial Road, Portsmouth, and copies of the bills of quantities obtained on payment of a sum of £2 2s. Sealed, endorsed tenders, marked "Tenders for Building, etc.," addressed to the chairman of the Board, must be delivered at the Workhouse, Milton, not later than noon on Jan. 27.

January 27. DUBLIN.—Erection of a new ward block and boiler house etc., at the Military Hospital, Arbour Hill, Dublin, for the Secretary of State for War. Plans, specifications, and conditions of contract may be inspected at the office of the Director of Barrack Construction, 6, Pall Mall, London, S.W., or at the Barrack Construction Office, Arbour Hill Hospital, Dublin, on Jan. 13, 14, and 15. Those desiring to tender and to receive a copy of the bills of quantities must apply to the Director of Barrack Construction not later than Jan. 18. The application must be accompanied by a deposit of 10s. Cheques or orders to be made payable to the Assistant Financial Secretary, and crossed "Bank of England for credit to Army Funds." Tenders on the form supplied, with the bills of quantities, must be delivered in sealed envelopes, marked "Tender for New Ward, etc., Military Hospital, Arbour Hill, Dublin," not later than 12 noon on Jan. 27, addressed to the Director of Army Contracts, War Office, Whitehall, London, S.W. The bills of quantities should accompany tender in a separate sealed envelope, similarly addressed, and marked "Bills of Quantities for New Ward, etc., Arbour Hill Hospital, Dublin," with the contractor's names and addresses thereon.

Jan. 30. BRISTOL.—Erection of a new elementary school, at Soundwell Road, Staple Hill, Bristol, for the Gloucestershire Education Committee. Bills of quantities can be obtained from R. S. Phillips, architect, Midland Bank Chambers, The Cross, Gloucester, upon depositing £2 2s. Tenders must be delivered by 9 a.m. on Jan. 30.

Feb. 1. LONDON, N.W.—Construction of coal bays, fittings, and other workships, stores, lodge, cottages, etc., at Cricklewood, and cottages, etc., at Kempton Park, in the county of Middlesex, for the Metropolitan Water Board. Forms of tender, conditions of contract, specification and bills of quantities may be obtained from the engineer, Staines Reservoirs Communication Works, The Firs, Southern Road, Fortis Green, East Finchley, N., on the production of an official receipt for the sum of £10, which sum must be deposited with the accountant to the Board, Savoy Court, Strand, W.C. Such payments and applications can be made any week-day (except Thursdays and Saturdays) between the hours of 10 a.m. and 4 p.m. Tenders, addressed to the clerk, Metropolitan Water Board, Savoy Court, Strand, W.C., and endorsed "Tender for Coal Bays, etc., Cricklewood and Kempton Park," must be delivered in sealed envelopes at the offices of the Board, not later than 10 a.m. on Feb. 1.

No date. BEN RHYDDING.—Erection of two villas at Ben Rhydding. Deposit 5s. Quantities can be obtained of C. H. Brooke, architect, 7, Cookridge Street, Leeds.

No date. TERRINGTON ST. CLEMENT.—Erection of slaughter-house, stable, etc., converting two cottages into dwelling-house, and general improvements, for A. J. Collison at Terrington St. Clement. Plan and specification may now be seen at the offices of Walker and Walker, architects, 2, Lower Hill Street, Wisbech.

ENGINEERING.

Jan. 18. BECKENHAM.—Electric wiring of houses in their district, for the U.D.C. Specifications, general conditions, and forms of tender can be obtained on payment to the Council's collector of the sum of £2 2s. The collector attends at the Council offices, Bromley Road, Beckenham, from 9 to 10 a.m. daily. For any further information with regard to the proposed contract, application should be made to J. E. Tapper, resident engineer, Electricity Works, Church Fields Road, Beckenham. Sealed tenders, endorsed "Wiring," to reach F. Stevens, clerk of the Council, Council Offices, Beckenham, not later than 4 p.m. on Jan. 18.

Jan. 18. GLASGOW.—Construction of the Works in the Counties of Stirling and Perth, authorised by the Glasgow Corporation (Water and General) Order, for raising the level of Loch Arklet and conveying water therefrom to Loch Katrine. Copies of the specification, schedule of quantities, and form of tender, together with prints of the drawings, may be obtained from J. R. Sutherland, the engineer to the Water Department, 45, John Street, Glasgow, upon payment to the Water Treasurer, 45, John Street, Glasgow, of £10 10s. The resident engineer will meet intending contractors on the site of the works, at 10 a.m. on Jan. 6 and 7. Sealed offers, marked "Water Department—Tender for Loch Arklet Works," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, on or before 12 o'clock noon, on Jan. 18.

Jan. 19. LONDON, W.—Altering Lifts and Fans at present worked by continuous current lifts and 2 fans to work from single-phase alternating current and 2 fans to work from steam engine. Schemes and tenders are invited by the Parish of Hammersmith. Firms tendering to specify what allowance they are prepared to make for present transforming plant and continuous current motors. Drawings, detailed specifications, etc., to be supplied free of cost to the Guardians. Tenders, endorsed "Tender for Altering Lifts, etc.," to be delivered before Jan. 19, to J. Lamb, clerk to the Guardians, 206, Goldhawk Road, Shepherd's Bush, from whom specification can be obtained.

Jan. 20. CAIRO.—Supply of a universal milling machine (machine à fraiser) required by the Khedival School of Arts and Trades. Tenders must be made on stamped paper of 3 Egyptian piastres (obtainable from Lt.-Colonel Western, C.M.G., Queen Anne's Chambers, Broadway, Westminster, S.W.), and should be accompanied by full particulars and plans, etc., of the machine offered. They should be addressed to the Director of the School of Arts and Trades, Cairo, where they will be received up to noon on Jan. 20. Tenders should be endorsed "Offre pour fourniture d'une machine à fraiser." The copy of the specifications and conditions mentioned above (in French) may be examined by British makers on application at the Commerçial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C.

Jan. 26. LONDON, S.W.—Laying of stoneware cable-ducts, for the L.C.C. Full particulars, and also information as to the conditions to be observed by tenderers, will be found in the "London County Council Gazette" of Jan. 4 and subsequent issues. Tenders must be upon the official forms to be obtained from the clerk of the Council, County Hall, Spring Gardens, S.W., upon payment to the cashier of the Council of the sum of £2 for the specification, etc. Full particulars of the work may be obtained on application at the County Hall, before the payment of the fee for the specification, etc. No tender received after 11 a.m. on Jan. 26. will be considered.

Jan. 27. LONDON, W.—Supply of 1-2,000 k.w. steam turbine generating set, with condenser, for the Metropolitan B.C. of Hammersmith. Specification and form of tender can be obtained from G. G. Bell, borough electrical engineer, Electricity Department, 85, Fulham Palace Road, W., upon payment of £1 1s. Tenders, endorsed "Turbine Generating Set," must be delivered to H. Thompson, town clerk, Town Hall, Broadway, Hammersmith, not later than 4 p.m. on Jan. 27.

IRON AND STEEL.

Jan. 16. GLASGOW.—Supplying about 400 tons of cast-iron pipes, 18 in. in diameter, for the Corporation. Drawings may be seen, and copies of the specification and forms of tender obtained on application to J. R. Sutherland, engineer to the water department, 45, John Street, Glasgow. Sealed offers, marked outside "Tender for Pipes, Water Department," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, on or before Jan. 16.

Jan. 19. SOUTH DARLEY.—Manufacture and delivery at Darley Dale Station (Midland Railway) of about 160 tons of 5 in., 4 in., and 3 in. cast-iron spigot and socket pipes, together with all bends, junctions, tapers, and other specials (vertically cast pipes of British manufacture only), for the U.D.C. Also for cutting trenches and hauling, laying and jointing about 8,000 lin. yds. of 5 in., 4 in., and 3 in. cast iron pipes; the provision and fixing of valves, etc.; the construction of intake works at Stanton Lees, and the construction of a ferro-concrete reservoir at Wensley Hill (capacity 97,500 gallons), and other works incidental to the contract. The whole of the works will be let in one contract, and will not be divided. Plans may be seen at Market Hall Chambers, Matlock. Specification, bill of quantities, and form of tender can be obtained on application to Taylor, Wallin and Taylor, engineers, Cathedral Buildings, Newcastle-upon-Tyne, on payment of £3 3s. deposit. Sealed tenders, on the prescribed form, with schedule of prices, etc., properly filled in, endorsed "South Darley Waterworks," must be delivered to R. Taylor, clerk to the Council, Market Hall Chambers, Matlock, Derbyshire, not later than Jan. 19.

Jan. 26. YNYSCYNHAIARN.—(1) For about 150 tons 3in. to 8in. cast or steel gas main and fittings for the U.D.C. Specifications and forms of tender can be obtained from J. Jones, clerk to the Council, Town Hall, Portmadoc, on payment of £1 1s. Tenders, addressed to the undersigned and endorsed "Tender for ——," to be delivered not later than Jan. 26.

March 1. CAIRO.—Construction of a floating dock for the Administration of the Egyptian State Railways. Specifications, price 10s., may be obtained from Lt.-Colonel Western, C.M.G., Queen Anne's Chambers, Broadway, Westminster, London, S.W. Tenders will be received by the General Manager, Egyptian State Railways, Cairo, up to noon on March 1

PAINTING.

Feb. 2. MANCHESTER.—Painting at the undermentioned places, for the Directors of the Lancashire and Yorkshire Railway. 1, from Southport (Central) to Preston; 2, Wigan to Southport; 3, at Blackburn; 4, Burnley to Todmorden; 5, at the carriage and wagon works, Newton Heath; 6, Newton Heath to Rochdale, and the Middleton branch; 7, Rochdale to Sowerby Bridge; 8, Sowerby Bridge to Mirfield and at Dewsbury Junction; 9, at Bradford; 10, at Hull. Specifications and separate forms of tender may be obtained on personal application at the engineer's office, Hunt's Bank, Manchester. Tenders, endorsed "Tender for Painting," to be in the hands of R. C. Irwin, secretary, Hunt's Bank, Manchester, not later than 10 o'clock on the morning of Feb. 2.

PLUMBING & SANITARY

Jan. 16. PADSTOW.—(1) Construction of a stoneware pipe sewer, with all necessary excavations, manholes, and other works, and with cast-iron pipe outfall into the Estuary of the River Camel, including 594 yds. run of 12 in., 9 in., and 6 in. stoneware pipe sewers, and 92 yds. of 1 ft. 6 in. cast-iron pipe sewers. (2) The construction of a piece of road 350 ft. long and 35 ft. wide, providing all necessary metalling, etc., including the construction of a footpath 5 ft. wide on either side of the road, with proper kerbing and channelling, etc., near the railway station, Padstow. Plan and specification may be seen on application to R. T. Hocking, Manor Office, Padstow, or at the office of T. H. Andrew, engineer, Market Hill, St. Austell. Tenders must be sent to Shilson, Coode, and Co., solicitors, St. Austell, on or before Jan. 16.

Jan. 18. SPENNYMOOR.—(a) Extension of the main sewer in Durham Road, Spennymoor; (b) road-making, etc., required in the widening of Ridley's Buildings, Spennymoor, for the U.D.C. Plans, specifications, etc., may be seen and forms of tender obtained, on application to C. R. Spencer, surveyor to the Council, Silver Street, Spennymoor. Tenders, endorsed respectively "Durham Road Sewer" and Ridley's Buildings" to be sent to F. Badcock, clerk to the Council, Council Offices, Spennymoor, not later than Jan. 18.

Jan. 19. SHOEBURYNESS.—Construction of about 540 yds. of surface water drain, with manholes and gulley connections, at Shoeburyness, for the U.D.C. Plans, sections, and specifications may be seen, and schedules of quantities and form of tender obtained of H. A. Harris, surveyor, Clarence Street, Southend, on payment of a deposit of £1 1s. Sealed tenders, marked "Tender for Drain," must be sent to F. Gregson, clerk, 46, Alexandra Street, Southend-on-Sea, not later than 3 p.m. on Jan. 19.

Jan. 21. LEEDS.—Sewerage works for the Sewerage Committee in (1) Hyde Terrace; (2) Kirkstall Lane; (3) Beeston, near Royds; (4) Coal Hill Lane. Drawings may be seen, and forms of tender with copies of the documents forming the contract may be obtained on application to W. T. Lancashire, city engineer, Municipal Buildings, Leeds, on payment of a deposit of £3 3s. Tenders must be on the official form, enclosed in a sealed cover, and endorsed "Sewerage Works," addressed to the Town Clerk, and delivered at the Town Hall, Leeds, not later than 10 a.m. on Jan. 21.

Jan. 23. LEVENSHULME.—Length of 12 in. surface water drain from the culvert in Broom Lane to Thorncliffe Grove, in the Council's district, for the U.D.C. Specifications, bills of quantities and further particulars may be obtained on application to J. Jepson, Moseley Chambers, 35, Great Underbank, Stockport, surveyor to the Council. Tenders, endorsed "Tender for Surface Water Drain," to be sent to J. O. Hardicker, clerk to the Council, Northern Assurance Buildings, Albert Square, Manchester, not later than Jan. 23.

ROADS AND CARTAGE.

Jan. 18. PLYMOUTH.—Making up and completing, under section 150 of the Public Health Act, 1875, the following streets and lanes, for the Corporation: 1, Cleveland Road (footway); 2, Eton Street; 3, Lipson Hill Terrace Lane; 4, Lucas Terrace extension. Plans and specifications and conditions upon which forms of tender will be granted may be seen at the office of J. Paton, borough engineer, Municipal Offices, Plymouth, and bills of quantities obtained. Sealed tenders must be delivered at the said offices not later than 5 p.m. on Jan. 18.

January 18. LONDON, S.W.—Making-up and paving of the new part of the street called Wimbledon Road, Balham, and Springfield, lying between Garratt Lane and the Borough Boundary, for the Metropolitan B.C. of Wandsworth. The specification and drawings may be seen, and forms of tender obtained, at the borough engineer's office, New Streets Department, 56, East Hill, Wandsworth, S.W., between the hours of 10 and 4 (Saturdays 10 and 12). Tenders, enclosed in sealed envelopes, and endorsed "Tender for Paving Wimbledon Road," must be delivered at the Council House, East Hill, Wandsworth, S.W., and may be placed by the person tendering in the box provided for the purpose not later than four o'clock in the afternoon of Jan. 18. Securities required. Fair wages clause.

Jan. 20. BOURNEMOUTH.—Making up Frederica Road. Full particulars forms of tender, specification, and schedule can be obtained of F. W. Lacey, borough engineer, Municipal Offices, Bournemouth, at whose office drawings can be seen, provided that the sum of £1 1s. has been previously deposited in respect of the tender. Tenders to be sent in, in envelopes furnished for the purpose, to G. W. Bailey, town clerk, before 11 a.m. Jan. 20.

Jan. 20. BOURNEMOUTH.—Making up Oxford Avenue (first portion). Full particulars, forms of tender, specification, and schedule can be obtained of F. W. Lacey, borough engineer, Municipal Offices, Bournemouth, at whose office drawings can be seen provided that the sum of £1 1s. has been previously deposited in respect of the tender. Tenders to be sent in, in envelopes furnished for the purpose, to G. W. Bailey, town clerk, before 11 a.m. of Jan. 20.

Jan. 20. WOODBRIDGE.—Supply of granite or basalt, broken to pass through a $\frac{1}{4}$ in. and not less than $1\frac{1}{2}$ in. gauge, for the R.D.C., at Council's Wharf, at Wilford Bridge or Melton G.E.R. Station, 1,000 tons. Whole chalk flint:—At Council's Wharf, at Wilford Bridge, 2,500 tons; at Levington Creek and Nacton Hard, 400 tons; at Westerfield G.E.R. Station or delivered on roads at Tuddenham and Witnesham, 300 tons. Wash Mill Flints of the very best quality:—At Council's Wharf at Wilford Bridge, 1,000 tons; at Levington Creek and Nacton Hard, 300 tons; at Waldringfield Hard, 300 tons; at Boyton Dock, 150 tons. All materials to be delivered between April 1 and Sept. 1, at such times and in such quantities as the surveyor may direct, and will be subject to his approval. No form of tender will be supplied. Tenders, accompanied by samples, to be delivered (carriage paid) to H. E. Kell, Council Offices, Woodbridge, endorsed "Tender for Road Material," on or before 10 a.m. on Jan. 20. Any further information may be obtained of G. Cook, district surveyor, Grundisburgh, near Woodbridge, by enclosed stamped envelope.

January 21. CROYDON.—Making-up Foxley Hill Road, Purley, and Graham Avenue, Mitcham, for the Croydon R.D.C. Plans and specification may be seen and form of tender obtained on application to R. M. Chart, surveyor to the Council, Town Hall, Croydon. Sealed tenders to be delivered to E. J. Gowen, clerk of the Council, not later than 12 o'clock noon on Jan. 21.

Jan. 22. SPILSBY.—Supply of about 5,000 tons of broken granite, 9,000 tons of broken slag, and 400 tons of slag chippings, for the R.D.C., to be delivered in such quantities and at such times as the Council shall require and direct. Specifications, conditions of contract, and forms of tender, showing the stations at which the material is to be delivered and the approximate quantity to be delivered at each station, may be obtained on application to W. C. Brakenridge, district surveyor of highways, Spilsby, to whom a small sample box of stone must be sent. Tenders, endorsed on the cover "Tender for Road Material," must be delivered at the office of G. B. Walker, clerk, Spilsby, not later than Jan. 22.

January 23. NORWICH.—Supply of granite for the year ending March 31, 1910, for the Norfolk C. C. Specification and form of tender may be obtained at the office of T. H. B. Heslop, county surveyor, The Shirehouse, Norwich, upon receipt of a 2d. stamped addressed large foolscap envelope. Tenders can only be received on the forms provided, and must be endorsed "Tender for Granite," to be sent in to the clerk to the Council, the Shirehouse, Norwich, on or before Jan. 23.

Jan. 23. BIRMINGHAM.—Supply of materials for one year, ending March 31, 1910, for the Public Works Committee:—Granite kerbs, setts, crossing stones, chippings, flags, paving bricks, wood paving blocks, ragstone, gravel, sand and slag. Forms of tender, copies of conditions, and specifications may be obtained, at the city surveyor's office, Council House, Birmingham, on payment of £1 for each copy. Samples of materials tendered for must be sent, carriage paid, to H. E. Stilgoe, city engineer and surveyor, The Council House, Birmingham. Tenders must be made out on the forms provided, and delivered at the surveyor's offices on Jan. 23, endorsed "Tender for Stone, etc.," and addressed to the City Surveyor, Council House, Birmingham. Securities required.

January 25. PENGE.—Private street works in Challin Street, for the U.D.C. within their district. Plans and specification may be seen and copy of the bill of quantity with form of tender obtained on application to H. W. Longdin, surveyor, Town Hall, Anerley, S.E., on payment of £2. Sealed tenders, accompanied by priced quantities, endorsed "Tender for Roadmaking," to be delivered to C. W. Dommett, clerk to the Council. Town Hall, Anerly, S.E., not later than 12 o'clock noon on Jan. 25.

Jan. 26. LONDON, S.E.—Supply of 200 tons of waste and broken pieces of Jersey or Guernsey granite for breaking, for the Guardians of the Poor of the parish of Lambeth, to be delivered at their stone yard, in Wincott Street, Kennington Road, S.E., having first been weighed by the contractor at the weighbridge of the workhouse in Renfrew Road. Tenders, with full specification, including name of quarry, must be sent to J. L. Goldspink, clerk, Guardians' Board Room and Offices, Brook Street, Kennington, S.E., sealed and superscribed "Tender for Granite," on or before Jan. 26, and will be opened at the board room on Jan. 27. The tenders may be placed in the box provided for their reception, in the office of the clerk to the Guardians, by the contractors or their representatives should they so desire. A small sample of the stone to be supplied should be sent.

Jan. 28. TUNBRIDGE WELLS.—Paving, metalling, and making up of Campbell Road and Culverden Avenue, for the B.C. Plans, sections, and specifications can be seen, and copies of the bill of quantities can be obtained at the office of W. H. Maxwell, borough engineer and surveyor, Town Hall, Tunbridge Wells. Securities required. Tenders, endorsed "Private Street Works," to be sent to W. C. Cripps, town clerk, Town Hall, Tunbridge Wells, on or before 9 a.m. on Jan. 28.

Feb. 2. HATFIELD.—Supply of broken granite and slag required for the main roads during the year ending March 31, 1910, for the Herts. C.C. Forms of tender and condition of contract may be obtained on application at the office of U. A. Smith, county surveyor, Hatfield, or will be sent through the post upon receipt of a stamped addressed foolscap envelope. Tenders, which must be upon the forms provided, are to be delivered not later than Feb. 2.

Feb. 6. CHELMSFORD.—Supply of Norway granite kerb, and setts, for the year ending March 31, for the Essex C.C. Forms of tender and the special envelope in which the tenders are to be delivered, and all other information and particulars, can be obtained at the chief surveyor's office at Chelmsford. Tenders to be delivered on or before Feb. 6, to P. J. Sheldon, chief surveyor, Chelmsford.

Feb. 17. GLOUCESTER.—Supply of stone for use on main roads for the year beginning April 1. Forms of tender can be obtained from E. S. Sinnott, county surveyor, Shire Hall, Gloucester, on and after Jan. 23, and tenders must be received not later than Feb. 17, marked outside "Tenders for Material."

MISCELLANEOUS.

Jan. 15. MANCHESTER.—Supply of the following stores required during the six months ending July 31, for the Directors of the Manchester Ship Canal Co.:—1, iron, steel, and files; 2, ironmongery, nails and bolts; 4, white and red lead, pitch. Specifications and forms of tender may be obtained on application at the Stores Department, Manchester Docks, Trafford Road, Salford. Intending contractors are requested to particularise the class of stores for which they wish to tender. Sealed tenders, endorsed "Tender for ," must be delivered to F. A. Eyre, secretary, 41, Spring Gardens, Manchester, not later than 10 a.m. on Jan. 15.

Jan. 16. DUNDEE.—Supply and delivery of fireclay retorts, fireclay bricks and materials, retort bolts and nuts, for the Gas Commissioners. Specifications, drawings and forms of tender may be obtained on application to A. Yuill, engineer and manager, Dundee Gas Works. Sealed and endorsed tenders to be lodged with W. H. B. Martin, clerk to the Gas Commissioners, City Chambers, Dundee, not later than Jan. 16.

Jan. 19. HEYWOOD.—Supply of retorts and fireclay goods, for the Gas Committee of the Corporation. Specification and quantities and form of tender may be obtained upon application to W. Whatmough, Gas Manager. Tenders, endorsed "Retorts and Fire-clay Goods," to be sent to G. G. Bouchier, town clerk, Municipal Buildings, Heywood, not later than Jan. 19.

Jan. 20. HALIFAX.—Supply of the following stores and materials required in the undermentioned departments of the Halifax Corporation during the twelve months ending March 31, 1910:—Highways and Tramways Departments: Portland cement, stoneware pipes, etc., oils, paints, etc., iron castings, ironmongery, artificial flags, manhole covers, gullies, timber, granite, limestone, lime, paving setts—sandstone, paving setts—granite, kerbstones, flags, bricks, puddles, and drain tiles. Forms of tender, specifications, and further particulars may be obtained on application to J. Lord, borough engineer, Town Hall, Halifax. Tramways and Electricity Departments—Schedule: No. 1, iron and steel; 2, timber; 3, bolts and nuts; 4, ironmongery, including washers, nails, screws, etc.; 5, glass; 6, lighting fittings; 10, oils and grease; 11, paints and varnishes; 14, castings (malleable iron, cast-iron, and brass), 15, tubes and fittings. Samples may be seen on application at the Stores, Skircoat Depot, any day, Monday to Friday, between 9 a.m. and 4 p.m. Forms of tender and full information may be obtained at the General Manager's Office, Skircoat Road. Intending contractors must state the number of schedule required. Tenders, in the envelope provided, must be sent to K. Walton, town clerk, on or before Jan. 20. Any samples submitted by the tenderers, which will not be paid for by the Corporation, must be marked "Sample—Tender for Stores," and sent to the borough engineer, Town Hall, and General Manager's office, Skircoat Road, respectively.

Jan. 21. PLYMOUTH.—Supply of the following goods and materials for the period of one year, for the Corporation Waterworks:—Fire hydrants, lead pipe and pig lead, stopcocks, ferrules, etc., cast-iron work, sluice valves. Particulars and forms of tender can be obtained at the office of F. Howarth, water engineer, Municipal Buildings, Plymouth. Tenders, enclosed in envelopes provided, to be delivered at this office by twelve o'clock noon on Jan. 21.

Jan. 21. LONDON, S.E.—Supply of broken granite, broken flints, gravel, ballast, sand, tar-paving, stock bricks, Portland cement, lime, timber for sewer work, for the Lambeth B.C. for one year from March 31. Also for cartage of materials, etc. Specifications and forms of tender may be obtained from H. Edwards, borough engineer, Town Hall, Brixton Hill, S.W., between the hours of 10 and 4 (Saturdays 10 and 12). Tenders must be delivered (in the official envelope supplied) at the Town Hall not later than 12 o'clock noon on Jan. 21.

Jan. 23. BIRMINGHAM.—Supply of stores for one year, ending March 31, 1910, for the Public Works Committee: Lias lime, Portland cement, drain pipes, gullies, gully pans, brown bricks, timber, castings, iron and steel ware, glass, and miscellaneous stores. Samples and patterns may be seen on application to the storekeeper at the Lamp Department, Park Street, and the Corporation Wharf, Sheepcote Street. Forms of tender, copies of conditions, and specifications may be obtained at the city surveyor's office, on payment of £1 for each copy. Samples of goods tendered for must be sent, carriage paid, to H. E. Stilgoe, city engineer and surveyor, The Council House, Birmingham, the samples of Portland cement, 4 lb. in weight, to be delivered by Jan. 18. Tenders must be made out on the forms provided and delivered at the city surveyor's offices on Jan. 23, endorsed "Tender for Stores," and addressed to the city surveyor, Council House, Birmingham.

Jan. 25. MANCHESTER.—Supply of Portland cement for the Rivers Committee, required at their Davyhulme Sewage Works during the period ending June 30. Delivery will be required at the Sewage Works Wharf, Davyhulme, on the Manchester Ship Canal. Forms of tender may be obtained on application to the secretary of the Rivers Department, Town Hall, Manchester. Tenders must be enclosed in the official envelope provided expressly for the purpose (otherwise the tender will not be considered) and delivered at the above office not later than 10.30 a.m. on Jan. 25.

Jan. 25. LONDON, S.E.—Supply of the following stores and material for the Camberwell B.C., for the year ending March 31, 1909:—(c) White lead, colours in oil and dry varnishes, oils, tar, pitch, creosote, etc., glass; (e) screws, nails, bolts, nuts, and washers, wrought iron, mild steel, tool and spring steel, cast-iron foundry goods, lead pipes, sheet, etc., unions, valves, etc., W.I. gas, water, and steam tube and fittings, rain-water goods, etc., etc.; (j) flints, ragstone, hoggin, hardcore, Thames and crushed ballast, broken granite, York and other pavings, tar materials, lime, cement, and miscellaneous building materials; (k) asphalte paving work; (n) stoneware drain pipes and sewer ironwork. Forms of tender may be obtained on application to W. Oxtoby, borough engineer, Town Hall, Camberwell, S.E., by specifying sections desired. Sealed samples may be inspected at Grove Vale Depot, opposite East Dulwich Station, between 10 a.m. and 12 noon, and 1 p.m. and 4 p.m.; Saturdays, 10 a.m. to 1 p.m. No tender will be considered except on the authorised form of tender, which must be delivered at the Town Hall not later than 5.30 p.m. on January 25.

Jan. 27. LONDON, S.W.—Supply of (8) granite kerbstones and setts, (9) York paving, (10) broken Guernsey or Alderney granite, (11a) broken English granite, (12) wood blocks, (14) hogging, ballast and sand (by barge alongside Council's Wharf), (15) hogging and ballast (delivered on roads), and rubbish shoot, (24) plumber's and painter's work, (25) lime and cement, for the Metropolitan B.C. of Chelsea, for a period of one year from April 1. Printed forms of tender, and information respecting contracts, may be obtained from T. W. E. Higgens, the borough surveyor, between 10 and 12 o'clock daily at the Town Hall. Samples may be inspected at Durham Wharf, Nos. 7 and 9, Lots Road. Each tender must be enclosed in the printed envelope obtainable with the form of tender, and must be placed in the box provided for that purpose, in the office of T. Holland, Town Clerk, Town Hall, King's Road, Chelsea, S.W., not later than 5.15 o'clock in the afternoon of Jan. 27.

Jan. 27. LONDON, S.W.—Supply and execution of the following articles and works, the contract period being from April 1 next to March 31, 1910, unless otherwise described, for the Metropolitan B.C. of Chelsea:—8, Granite kerbstones and setts; 9, York paving; 10, broken Guernsey or Alderney granite; 11A, broken English granite; 12, wood blocks; 14, hogging, ballast, and sand (by barge alongside Council's wharf); 15, hoggin and ballast (delivered on roads), and rubbish shoot; 17, removal of trade refuse; 24, plumber's and painter's work; 25, lime and cement; 26, oilman's goods; 27, ironmonger's goods. Printed forms of tender, and information, may be obtained from T. W. E. Higgens, the borough surveyor, between 10 and 12 o'clock daily at the Town Hall. Samples may be inspected at Durham Wharf, 7 and 9, Lots Road. Each tender must be enclosed in the printed envelope obtainable with the form of tender, and must be placed in the box provided for that purpose in the office of T. Holland, town clerk, Town Hall, King's Road, Chelsea, S.W., not later than 5.15 o'clock in the afternoon of Jan. 27. Persons tendering should seal their tenders.

Jan. 28. TUNIS.—Supply two electric goods lifts a quantity of milling machinery, three lever balances, etc., at the Military Offices, Bizerta.

Jan. 29. WATERLOO.—Erection of a new Council school for 100 children at Waterloo. Persons desirous of tendering may see plans, specification, and conditions of contract (no quantities), and obtain other information, at the office of W. J. Taylor, county surveyor, The Castle, Winchester, between the hours of 9 a.m. and 5 p.m. (Saturdays 9 a.m. and 1 p.m.). A copy of the plan and specification will also be deposited at existing school at Waterloo. Tenders, on forms supplied by the county surveyor, and endorsed "Proposed Council School, Waterloo," are to be delivered to H. Barber, clerk of the C.C., The Castle, Winchester, not later than 10 a.m. on Jan. 29.

Feb. 1. LONDON, S.E.—Supply of the undermentioned articles for one year from March 31, for the Metropolitan B.C. of Bermondsey:—Asphalt; (S) ballast, hoggin, and sand; (S) bricks; (X) broken Guernsey granite; (S) drain pipes; (X) granite, kerb and tram; (S) granite pitchings; (S) hard wood paving blocks; (X) ironmongery; lime; paints and oils; Portland cement; (X) sewers ironwork; (X) York paving. Samples must be sent with the above marked (S), and samples of those marked (X) can be seen at the Council's offices, Town Hall, Spa Road, S.E. Forms of tender and other particulars can be obtained on application to F. Ryall, town clerk, Town Hall, Spa Road, S.E. Tenders, addressed to the Town Clerk, and endorsed "Tender for — " (as the case may be), must be delivered not later than Feb. 1.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ADVERTISER (38), well up in all branches of air-tight work, seeks situation as foreman in shop-fitting or high-class joinery works; 9 years in present situation.—Box 4785, BUILDERS' JOURNAL Office.

AN architect and surveyor who has held a responsible position, and has had 9 busy years' varied experience, desires situation in architect's, surveyor's or land agent's office, as an assistant, with view to partnership; moderate salary; satisfactory references.—Apply Box 4784, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant (24), 4 years in present situation, 8 years' experience, town and country, will be disengaged on Feb. 1st.—G. G. S., 39, Caithness Road, West Kensington Park, W. 4774

ARCHITECT'S Assistant, nearly 23, desires re-engagement, permanent or temporary; first-class experience of town and country work, domestic, schools, libraries, business premises, competition and working drawings, perspectives, surveying and levelling; excellent references; moderate salary.—F. E. J., 10, Cobham Road, Kingston-on-Thames. 4751

ARCHITECT and Surveyor's Assistant (25), six years' London experience, design, surveying, quantities, Hon. Building Construction Inter.R.I.B.A.; excellent references; salary £2 2s.—Apply Box 4780, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant, age 27, desires engagement, permanency preferred; good draughtsman, and capable at working drawings, details, perspectives, water-colour, and pen and ink, assistance with specifications, quantities and general work, levelling and survey; salary 30s.—Apply Aubrey Leonard Pritchard, Bryn Derwen, Rhyl, North Wales. 4709

ARCHITECT'S Assistant (23), over 6 years' experience in various London offices; good references.—G. O. E., 72, St. Ann's Hill, Wandsworth, S.W. 4790

ARCHITECT'S and Surveyor's Assistant, 15 years' good practical experience; excellent draughtsman, designer and colourist; working drawings, details, specifications, surveying, levelling and general routine; excellent references; moderate salary.—A. R., 1, Ivy Villas, Cheam, Surrey. 4698

ARCHITECT'S Assistant (23), late pupil, seven years' all-round experience, been clerk of works, working drawings, details, etc., knowledge of quantities and perspective.—E. P. Lee, 631, Commercial Road, London, E. 4781

ARCHITECTS, builders, estate agents (19), good energetic draughtsman, tracing, colouring, working drawings, etc.; willing to assist in office work; references.—F. J. Williams, 89, Shrubland Street, Leamington Spa, Warwickshire. 4796

ARCHITECT'S junior assistant (20), seeks permanent engagement, town or country; shorthand.—C. Weston, The Laurels, Rotherfield, Tunbridge Wells. 4734

ARCHITECT'S assistant (23), over 7 years' London and Provincial experience; excellent references; Inter.R.I.B.A. Exam. — H. J. Wilson, "Brinkdale," Park Road, Peterborough. 4670

ARCHITECT'S Junior Assistant desires engagement in London; 6 years' experience, contract drawings, details, and measuring; moderate salary.—Box 4737, BUILDERS' JOURNAL Office.

ARCHITECT'S Junior Assistant (19), 4 years experience in West End Office, working drawings, details, perspectives, competitions, excellent references; salary 21s.—Box 4777, BUILDERS' JOURNAL Office.

ASSISTANT (23) disengaged; six years' experience town and country. Student R.I.B.A.; working and detail drawings, perspectives, levelling, shorthand and typewriting; good references; moderate salary.—S. Riches, 35, Culverden Road, Balham. 4735

ARCHITECT'S and Surveyor's Assistant, 15 years' good practical experience; excellent draughtsman, designer, and colourist; working drawings, details, specifications, surveying, levelling, and general routine; excellent references; moderate salary.—A. R., 1, Ivy Villas, Cheam, Surrey. 4698

ARCHITECT'S Junior Assistant, over 4 years' London experience, competition work, contract drawings, details, perspective; honours construction, Prelim. R.I.B.A.; very moderate salary.—Box 4661, BUILDERS' JOURNAL Office.

ARCHITECT'S son, 10 years' office experience, wishes to take up agency or post as representative in Lancashire, or North of England, to well-known firm in any special line of Building trade.—Apply Box 4585, BUILDERS' JOURNAL Office.

AS Clerk, cashier, depot manager, or any position of trust, 11 years' experience, builder's and coal merchant's trade; age 25; good penman; also reference; moderate salary.—Box 4659, BUILDERS' JOURNAL Office.

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

BUILDER'S general foreman, advertiser seeks engagement; 16 years' service as above with first-class London firm on important and various works; good references.—Address H., 150, Effra Road, Wimbledon, S.W. 4703

BUILDER'S or architect's assistant, 25, desires re-engagement, drawing, typewriting, shorthand, correspondence, accounts, and general office routine; also assist in quantities; excellent references, moderate salary.—Apply Box 4756, BUILDERS' JOURNAL Office.

BUILDER'S or surveyor's assistant (24), 11½ years' experience; quantities, estimating, plans, accounts and prices; excellent references; moderate salary with improvement. Eastern or Southern Counties preferred.—Box 4740, BUILDERS' JOURNAL Office.

BUILDER'S Assistant disengaged, 21 years' experience; office routine, plans, specifications, quantities, supervision, measuring up, levelling, and surveying; good references; abstainer.—L. J. Greaves, Prestwood, Great Missenden, Bucks. 4717

BUILDER'S Foreman, with good London experience of all trades, seeks position of trust; estate or business firm; correspondence invited.—H., 150, Effra Road, Wimbledon, S.W. 4716

CLERK of Works, just finishing large schools, wants situation, 15 years' experience; expert timber, good all trades; plans, surveying, levelling, etc., etc. Country estate preferred.—Caswell, New Council Schools, Biddulph, Staffs. 4720

CONTRACTOR'S outdoor manager and surveyor desires engagement; present situation 17 years; age 37; keen on variations; expert in measurements; all trades, quantities, estimating; town or country.—W., 2, Dalberg Road, Brixton. 4776

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, BUILDERS' JOURNAL Office.

ENGINEER, general, wants permanent appointment, official or private staff; thorough all-round experience; electrical, plumbing, smith, married, 34; good testimonials.—86, Bathurst Gardens, Willesden. 4704

FIREPROOF Engineers and Concrete Specialists. Advertiser, connected with above trades for 10 years, and whose name is well known in connection with same, desires position as manager, traveller, or head clerk; first-class book-keeper; aged 33; very moderate salary.—P. W. Potter, 73, Penshurst Road, Thornton Heath. 4719

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, BUILDERS' JOURNAL Office.

FOREMAN Painter seeks re-engagement; smart, energetic, good references; age 31; abstainer.—S. L., 37, Richmond Road, Dalston, N.E. 4767

GENERAL Foreman seeks re-engagement, town or country; thoroughly practical in all trades; energetic, reliable and good manager of men; good references.—E. C., 15, Park Road, Merton, S.W. 4778

GENERAL foreman, disengaged, thoroughly practical and reliable; 20 years' experience; new or alterations; first-class reference.—F. C., 3, Crewdson Road, Brixton, S.W. 4668

GENERAL Foreman seeks re-engagement; alterations or new, practical experience in all branches; carpenter and joiner; good references; age 36; moderate wages.—Caplen, 3, Victoria Mansion, Edgware Road, Paddington, W. 4779

GENERAL Foreman seeks re-engagement, thoroughly practical and reliable; new or alterations; carpenter and joiner; life abstainer; first-class references.—Foreman, 3, Hawbridge Road, Leytonstone. 4787

JUNIOR Assistant desires situation, home or abroad; good practical knowledge of construction and details; competent draughtsman and colourist, working drawings, measuring and supervising, surveying and levelling; moderate salary.—Box 4013, BUILDERS' JOURNAL Office.

JUNIOR Clerk for builder's office in North London, shorthand, typewriting, and accuracy in figures essential; early hours. — Box 4783, BUILDERS' JOURNAL Office.

PLUMBER (Reg. by Exam.), well up in hot water and heating systems, capable of taking entire charge; 6 years' ref.; age 38.—H. P., 11, New Buildings, Hampstead, London. 4676

PLUMBING, etc., Sanitary or Lead-laying, job wanted, day or piecework; anywhere; lowest prices; best work; excellent references; used to speculating or jobbing.—Squirrell, 47a, Woodland Street, Dalston, N.E. 4749

QUANTITY Surveyor's Assistant (21), 4 years' experience, desires engagement, certificates and good references. — Apply Box 4745, BUILDERS' JOURNAL Office.

QUANTITY Surveyors.—A builder wishes to place his son (18) in above office; has had some experience. No premium, but can introduce business.—Apply H., Ashford House, Wimbledon Common. 4686

REINFORCED concrete foreman, disengaged, long and varied experience, especially in Kahn bars and expanded metal, timbering a speciality; carpenter by trade; good refs.—G. C., 59, University Road, Tooting, London. 4721

SLATE MERCHANTS AND BUILDERS' MERchants.—Experienced traveller (with 14 years' connection Midlands), desires re-engagement; at liberty middle of December; or could arrange earlier.—Address, Slate, c/o Secretary, Builders' Exchange, Sheffield. 4624

SLATING and tiling wanted (labour only) day or piece; any quantity, large or small; distance no object.—Mack, Slater and Tiler, 3, Granville Cottages Tower Hamlets Street, Dover. 4619

SHOP or General Foreman, long West-end experience, used to alterations and repairs; understands stairs; used to good jobbing work. Address A., c/o Mr. Seymour, 14, Allsop Place, Regent's Park, N.W. 4586

TO Builders.—Situation as improver wanted by young man just out of his time; technical student; neat draughtsman; assist with quantities, supervision, etc.; abstainer. — Box 4662, BUILDERS' JOURNAL Office.

TO Estate Owners.—Builder (38), varied experience, desires position as agent or clerk of works, surveys, plans, quantities, setting out, accounts and supervision; country preferred.—Box 4591, BUILDERS' JOURNAL Office.

VOLONTAIRE.—Foreign gentleman (21) desires position in builder's office, with opportunity of learning.—B. B., 43, Bolingbroke Grove, Wandsworth Common, S.W. 4789

Appointments Vacant.

BUILDER'S Clerk, experienced and relable; estimates, accounts, usual office routine; preference to Welshman; state age, salary, and references.—Apply Glamorgan, Box 4764, BUILDERS' JOURNAL Office.

BUILDER'S Assistant required in West Country office; knowledge of drawing, quantities, typewriting; excellent opportunity to learn business; cyclist; state full particulars and salary.—Box 4770, BUILDERS' JOURNAL Office.

CLERK required by architect, typewriting and shorthand; state experience and salary.—Box 4754, BUILDERS' JOURNAL Office.

WANTED, immediately, a first-class active all-round architect's assistant, with considerable experience in public, elementary, and secondary school planning. He must also be an expeditious draughtsman, capable of writing specifications and checking accounts. Preference given to one capable of preparing a complete bill of quantities (London system), up to at least £10,000. Salary not to exceed three guineas per week, payable monthly. Apply stating full particulars and testimonials (copies) to D. Pugh - Jones, County (School) Architect, 62, Charles Street, Cardiff. 4733

January 20, 1909 **Volume 29. No. 3.**

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: German Art and Architecture: The Shakespeare Memorial Theatre - - - 47
Toledo Cathedral; Scandalous Contract Forms; Books for the Architectural Student; Perturbed Paris - - - - 48
Brick, Stone and Timber. By H. D. Searles-Wood, F.R.I.B.A. - - - - - - 49
Proposed New Works - - - - - - 51
Notes on Competitions - - - - - 52
Law Case - - - - - - - - 52
Notes and News - - - - - - - 52
R.I.B.A. Prizes and Studentships - - - 53
Public Abattoirs. By R. Stephen Ayling, F.R.I.B.A. - - - - - - - 53
Institute Members' Club - - - - - 54
The Abbey Memorial to Lord Salisbury - - 54
The Commission on Ancient Monuments in Wales - - - - - - - - 54
Mural Decoration at the Central Criminal Court 54
Our Plate - - - - - - - - - 54
Enquiries Answered - - - - - - 55
The Concrete Institute - - - - - 63
Works in Progress and Completed - - - 63
Builders' Foremen's Association - - - 64
Federation News - - - - - - - 65
Trade and Craft - - - - - - - 66
Coming Events - - - - - - - 66
Complete list of Contracts Open xxiii., xxiv., xxvii.
Tenders - - - - - - - - vi., viii.

FIRE-RESISTING CONSTRUCTION SECTION.

Fires in 1908 - - - - - - - - 57
Fire Prevention in 1908 - - - - - 57
A Notable Fire at a Paris Drapery Store - - 59
Concrete Aggregates and Fire Resistance - 59
Fire Protection on the Underground Railways 61
Recent Official Tests of the B.F.P.C. - - 61

ILLUSTRATIONS.

Selected Design for Proposed Public Shelter and Promenade, Whitley Bay. Edward Cratney, Architect - - - - - - - 49
Design for a County Hall. Colin J. Macdonald and J. Harold Sayner, A.R.I.B.A., Architects. Part of front elevation: *Centre plate.* Ground and principal floor plans - - 5
Enquiries Answered (4 diagrams) - - - 55, 56
House at Paulesbury, Northants. Herbert Norman, Architect. *Centre plate.*
Mr. W. Millar Higgs (Messrs. Higgs and Hill) 6

FIRE-RESISTING CONSTRUCTION SECTION.

St. Denis Drapery Store Fire, Paris: General views of Central Covered Courts, 58; do., do., Plan and Section showing portion affected by the fire, 59; do., do., View showing construction of Galleries, 60. Recent Official Tests of the B.F.P.C.: Hand pump and ordinary buckets, etc., used, 62; an asbestos cloth with cords, 6 a dyer's vat, 63.

German Art and Architecture. The current issue of the "Contemporary" contains a candid and trenchant article on "Art and the German Emperor." The article is signed "Eulenspiegel," which may be translated "Buffoon," or "Jester"; but, except for an occasional coruscation of caustic wit, there is nothing in the article to warrant so opprobrious a pen-name. The author, in fact, addresses himself very seriously to an examination of the present state of art in Germany, and his brief but pithy observations invest with fresh interest a subject that, in this country, has been, during recent years, somewhat strangely neglected—perhaps by way of reaction from the superabundance of German art that rather overwhelmed us in the early Victorian period. Recent information about German art has been almost entirely restricted to occasional records of the strange, surprising adventures of the Kaiser in that domain. It will be remembered that the Emperor's mother, an English Princess of gracious and blameless memory, was intensely artistic. The son inherits her interest; but it may be assumed that the burdens of empire do not leave him much leisure for the intensive cultivation of his undoubted taste. He has not kept pace with the movement, but this trifling fact does not prevent him from exerting his influence at every opportunity. Germany, one infers, is crowded with pictures and statues and buildings that in subject, design, and treatment show unmistakable traces of the imperial prerogative—or, as a French writer puts it, "of the intruism of jack boots and sabre in the domain of art." This interference is greatly resented and ridiculed by the Modernists, who, however, if they were amenable to it, might be all the better for it; for, says our informant, "to be strictly fair, the line of development which modern art in Germany has taken is calculated to fill the man of taste with amazement, nay, even with horror. The Germans, as a people, were never noted for their refinement of taste; but the orgies of inartistic licence revealed in the architecture, furniture designs, and sculpture of Germany are certainly an excuse for the Kaiser's *intransigeance.* No city bears the marks of the modern movement more clearly than Berlin. The wave of Græco-Roman 'stuccoco' architecture, which, to judge by the relics seen to-day, must have made the London of the 'sixties so depressing a place to live in, did not sweep over Germany to nearly the same extent as it ravaged England. From the discreet and chaste late Renaissance style of Schinkel, who flourished in Berlin at the end of the eighteenth and beginning of the nineteenth century, there was a gradual transition to the ornamental pseudo-old German house of the 'seventies. These houses are, in their turn, giving way rapidly to strange *baroque* creations, which combine in their motley heterogeneousness a dozen styles, and might have been transported out of the pages of the Yellow Book. The new blocks of flats in the residential quarters of Berlin, with their turrets and gables, their painted walls and green copper roofs, give an idea *en passant* of the struggle which is now going on between the artistic and the bizarre in modern art." The Emperor perhaps goes too far in an opposite direction. "Intelligent Germans," says the "Contemporary" critic, "who deplore the sharp antithesis between the Kaiser and the majority of German artists, admit that the licence which is now running riot and playing havoc with German art must be checked, and they welcome the Emperor's effort to enforce a healthy tone based on respect for convention." The Emperor, as we had occasion to mention a few weeks back, is inclined to be dogmatic and aggressive in architectural matters that are directly subject to his authority; but sculpture is his peculiar hobby, and he has been known to remark that if he had not been an Emperor he would have been a sculptor. Perhaps it is not very wise to allow either occupation to interfere with the other. The almost innumerable groups—battle-pieces, hunting scenes, and royal or imperial hunttives, in white marble or yellow bronze—put up under his direction, show that he knows or cares nothing for Rodin or Meunier, but prefers to be a law unto himself. As to the architecture of the country, the only comment that we care to make at the moment is that it has at least one conspicuous merit—it is distinctively German. The *baroque* style may be but a passing phase, but it has many admirers even in our own country, especially among those architects who, while attending the International Congress last year, saw so many striking manifestations of the style in Vienna. The taste of Berlin, however, is not to be compared with that of Vienna, for whereas the Viennese are artistic to the finger-tips, the Germans seem of late to have become entirely obsessed by the spirit of commercialism: from which, perhaps, the extravagances of the New Movement are an excessive rebound.

The Shakespeare Memorial Theatre. In spite of coy and diplomatic official denials, it now seems certain that the proposed memorial to Shakespeare will take the form of a national theatre. To-morrow (Thursday) there will be a meeting at the Mansion House, at which the scheme will be unfolded. Afterwards, there is to be a private meeting of the editors of the chief London and provincial newspapers, and finally a great public meeting will be called, at which all the available details will be made known. The mere magnitude of the memorial is, of course, a matter of money, depending on the response to the appeal for funds. Some indication of the requirements in this direction is useful, and accordingly Mr. William Archer and Mr. Granville Barker have produced a rough estimate of the cost. The site they have set down at £75,000; the building, with installation of scenery, costumes, etc., at £105,000. Add to these amounts a guarantee fund of £150,000, and the sum total required is £330,000. These data need not be criticised very closely, for they are purely speculative. There is, indeed, a strong, and surely not altogether unwarrantable, hope that a suitable site may be presented by the Government or some other public body—by the London County Council, perhaps, since the theatre must necessarily be placed in the heart of London. To fulfil this condition, it need not be set in the midst of the other theatres. Possibly a very appropriate place for it could be found in Blackfriars, not far from where Shakespeare and the Burbages had their famous playhouse. This was on or near the spot on which now stands Apothecaries' Hall; but, even if the exact spot were ascertainable and available, it could not be used. The theatre must be handsome and noble, and these qualities would be wasted in such a situation, unless the London, Chatham, and Dover Railway could be induced to take its blighting ugliness elsewhere. But possibly a suitable site could be found somewhere near the "Times" office—not in Playhouse Yard, which perpetuates the memory of Shakespeare's old Blackfriars Theatre, but in Queen Victoria Street, where, probably, the prosperous poet owned certain house-property. The spot is sufficiently central and accessible, and has strong sentimental claims; and there is considerable fascination in the thought that the Shakespeare memorial theatre would be the only playhouse within the City gates. We do not urge the proposal, however. The surrounding architecture is depressing enough to chill the ardour of the most courageous architect that could be chosen. The site is much more likely to be found in the vicinity of Charing Cross. That the memorial is to take the form of a theatre is indeed welcome news to the architect and builder; and it is to be devoutly hoped that the splendid opportunity of producing a building that shall be worthy of the world's greatest poet, of the city in which he worked, and of the nation that gave him birth, will not be spoiled either by lack of funds or by the maladminstration of them that might easily result from divided counsels and weak compromise. But, rather than anticipate such troubles, let us fortify ourselves with the sanguine belief that everybody will rise to this great occasion, that the right man will be selected, and that he will give us one of the noblest buildings in London.

Toledo Cathedral. Hardly had the appeal been made for funds for the erection of an English church at Madrid, when there came from Toledo the serious news that the magnificent cathedral there is in danger of collapsing. There is no reason to suppose that the danger is exaggerated, in order either to excite sympathy and attract funds, or with the meaner object of creating a momentary sensation in the cheap press; for the cathedral has been carefully inspected by a committee of architects, who have reported the urgent need of extensive repairs, and who, exercising some function or prerogative, or following some practice which we must confess we do not understand, have appealed to the Government for an immediate grant of £10,000. In this country the appeal would have to be made to the public, and the response might, or might not, be generous, but would almost certainly be tardy. Yet, in a comparatively poor country like Spain, where, however, the art sense is probably much more keen and pervasive, such an approach seems to be perfectly natural. Moreover, it is a supreme occasion; for the superb cathedral of Toledo has no rival in Spain save that of Burgos. The cathedral of Toledo dates from the thirteenth century, and is described, without very much exaggeration, as "one of the most magnificent specimens of Gothic architecture in the world," as, indeed, befits the metropolitan church of "the Gothic capital of Spain." The choir, which is in the centre of the building, comprises more than a hundred stalls of walnut wood, enriched with carvings representing scenes from sacred history, and episodes in the campaign of the Catholic sovereigns against Granada; and this work, to which there is hardly anything superior in existence, seemed to be in so much danger from the ruin that threatens the dome above it, that the church authorities deemed it advisable to order its immediate removal to the Church of the Trinity. The dome, which rises to a height of about 100ft., had become extensively cracked, and it is thought that a recent shock of earthquake has rendered its condition really perilous. If it should fall, the wonderful choir screen of marble and jasper would suffer destruction. Toledo, romantic Moorish walled city as it is, possesses nothing more interesting than its beautiful cathedral, and it is to be sincerely hoped that prompt action and efficient measures may avert the threatened calamity.

Scandalous Contract Forms. The stereotyped form of contract imposed by public authorities is iniquitous and scandalous. It may be taken for granted that, as a rule, an Official Receiver is not a creature of sentiment, and that he certainly has no bias in favour of debtors. His testimony in such conditions acquires peculiar and irresistible force. In the course of the public examination of an unfortunate debtor—a road contractor—in the Newcastle Bankruptcy Court, the other day, the Official Receiver (Mr. Thomas Gourlay) "severely criticised a form of contract which debtor had entered into with Haltwhistle Rural District Council, and said that such a contract, if it was enforced, was absolutely confiscatory, and must, in the case of small contractors, like the debtor, end in the Bankruptcy Court. It would be better for a man to be breaking stones at the roadside than working under such a contract." Counsel for the debtor naturally agreed with this denunciation. "The form of contract in this case," he said, "was the regular form adopted, and he agreed with the Official Receiver that in the case of small contractors it would be in the interests and to the benefit of the building owners to push a man into the Bankruptcy Court. The matter was a great grievance with all contractors, but they were helpless to defend themselves, inasmuch as the forms were all made out on the same lines." Our attention has been drawn to this case by the secretary of a master builders' association affiliated to the National Federation; and this fact lends point to the comment that we should have felt constrained to make upon it independently of its source—namely, that such a quasi-judicial utterance should greatly strengthen the hands of the Federation in its wise and just determination to get this iniquitous form altered. It would never have become operative if contractors had combined to oppose it. They are now in a position to smash it, and they should not spare the hammer. The case is of value and importance not only because it elicited the spontaneous condemnation by the Official Receiver, but even more because it illustrates most strikingly the scandalous injustice to which contractors are compelled to submit unless, instead of "hanging separately," they prefer to "hang together"—in such wise as to insist on a fair and reaonable consideration of their just rights. Individually, they have been powerless; corporately they can be irresistible in their demand for common fairness. In this matter of contract forms they are bound to succeed, and such a demonstration of the value of the Federation can hardly fail to secure it many fresh and enthusiastic adherents.

Books for the Architectural Student. In last week's issue we published a list of the books drawn up by a joint committee composed of members of the Board of Architectural Education and of the Board of Examiners, recommended to students preparing for the examinations of the Royal Institute of British Architects. A perusal of this lengthy list of books reveals the fact that many of them are of so expensive a nature as to be beyond the means of the average student of architecture; others, although excellent examples of their kind, are old and extremely difficult to obtain, whilst in some instances the books recommended are altogether out of date and obsolete. For example, how is the poor student, living in a remote part of the kingdom, able to obtain, for the purposes of close study, such valuable works as the following, viz., Cockerell's "Temples of Jupiter Panhellenius at Aegina," and "Apollo Epicurius at Bassae"; Gibbs' "Rules for Drawing the Several Parts of Architecture" (1732); Penrose's "Principles of Athenian Architecture"; Stuart and Revett's "Antiquities of Athens" (1762); Taylor and Cresy's "Antiquities of Rome" (1821); Berty's "La Renaissanse monumentale en France"; Campbell's "Vitruvius Britannicus" (5 volumes, 1715); Espouy's "Fragments d'Architecture de la Renaissance"; Kent's "Designs of Inigo Jones" (1727); Letarouilly's "Edifices de Rome moderne" 1840); or Sauvageot's four volumes on the Palais, Chateaux, Hotels et Maisons de France? Then, with reference to the books recommended for the study of geometry, are there not better works on "Geometrical Drawing" and "Practical Perspective" than the two volumes on these subjects which appear in the list? Finally, despite the fact that it contains much information of a general character, we doubt whether Newlands' "Carpenters' and Joiners' Assistant" can rightly be regarded as an altogether reliable text-book for students to consult in reference to an important trade in which other methods of construction have long since displaced many of those illustrated in a work published some fifty years ago. We are pleased to notice that the list of books is to be revised and amended "as occasion requires," and we do not hesitate to suggest that the one recently issued for the guidance of students should be at once superseded by another of a more useful character.

Perturbed Paris. Paris, M. Rodin has just declared, grows uglier day by day. Its architects are showing a deplorably utilitarian spirit. "They think of nothing but what the building is to be used for," he says. "When they have made a bridge that is strong enough or a hall that is high enough—little matter what is to be exhibited there: pictures, machinery, or pigs—they are satisfied. Little they care for beauty, and little have they of the sense of the beautiful. The ugliness, the brutality of their masses of stone and iron appears to them a sign of progress; to myself it seems nothing but barbarism." It is to be hoped that the new buildings are at least strong. If they are of questionable beauty, they should be at least constructed with a view to the possible consequences of extensions of the underground railways. The route of the new line for which excavations are being made between the Madeleine and the Bon Marchè may be pretty distinctly traced, according to a correspondent of the "Standard," by the line of buildings that have had to be shored up. Many of them are badly cracked; and, in particular, some of the public buildings, like the French Admiralty, are in considerable danger of being shaken to pieces either by the vibration from existing lines or by the sinking caused by further excavations. Whether the destructive vibrations are natural and at long intervals, or artificial and continuous, it is in each case necessary to devise efficient means of providing against their disastrous consequences to buildings. The ugliness may be a matter of opinion, but the cracks are indubitable, and they suggest that for the modern architect the earthquake problem has become complicated as well as urgent.

BRICK, STONE AND TIMBER.*

By H. D. Searles-Wood, F.R.I.B.A.

R.I.B.A. Brickwork Tests.

The Science Committee of the Royal Institute of British Architects carried out some experiments on the Strength of Brickwork, and the results which have been given from time to time in papers read at the Royal Institute have now been collected in book form, and can be obtained at the Institute. The bricks experimented on were London stocks, Gaults, Leicester red, Staffordshire blue, and Fletton. Single bricks, and in some cases half bricks, of each kind were tested, and also the lime mortar and Portland cement mortar; and similar bricks built in piers or walls were tested, and at the end of the book you will find a table of averages giving the rates between the crushing weight of the brick and the crushing weight of the pier or wall. The book contains all the facts connected with the experiments and illustrations of the piers and walls under pressure and after failure, so that anyone can work out for himself the different ratios that he may want in connection with his own work; and the book is a very valuable record of an interesting series of experiments. The building of the piers for series I. and II. was executed under the supervision at intervals of two members of the Science Committee, and a record of progress was kept so that the age of each pier at the time of testing could be ascertained. The piers were built by a large firm of contractors at day-work prices, and it is with regret that the Committee have to state that during the absence of the members, the bricklayers, finding the Leicester red and Staffordshire blue bricks very hard to cut, filled in a great portion of some piers with closers of London stocks. This for experimental purposes destroyed the value of these piers, and the committee were obliged to have fresh piers built, but it incidentally affords a sample of jerry work which goes on under conditions when it would appear impossible. A comparison between these faulty piers and those built under the clerk of works, affords some useful information, as it may be taken that similar scamping work occurs every day.

Standard Size of Bricks.

The subject of the standard size of bricks was taken up by the Science Committee in 1897, and a conference with representatives of the Institute of Civil Engineers and the Brickmakers' Association.

Now that the Royal Institute of British Architects has fixed the standard size of bricks, it may be of interest to say a word or two on the subject.

The standard size is:—

1. The length of the brick should be double the width, plus the thickness of one vertical joint.

2. Brickwork should measure four courses of bricks and four joints to a foot.

Joints should be ¼-in. thick, and an extra 1-16 in., making 5-16 in. for the bed joints to cover irregularities in the bricks. This gives a standard length of 9¼in. centre to centre of joints.

The bricks, laid dry, to be measured in the following manner:—

A. Eight stretchers laid square end and splay end in contact in a straight line to measure 72in.

B. Eight headers laid side by side, frog upwards, in a straight line, to measure 35in.

C. Eight bricks, the first brick frog downwards and then alternately frog to frog and back to back, to measure 21½in.

A margin of 1in. less will be allowed as to *A*, and a ½in. less as to *B* and *C*.

This is to apply to all classes of walling bricks, both machine and hand made.

This size has been arrived at after a careful consideration of long lists of different sizes of bricks from all over the United Kingdom and Ireland, and as will be seen, it is about the average size of London stocks. It is hoped that the brick users in the North will come into line, although no doubt it will take some time for the builders who have been accustomed to the larger bricks to take up this smaller size.

Fancy Sizes of Bricks.

On the other hand, many architects object to the standard of four bricks and four courses measuring 1ft., and say that, although they agree with the proportion of length to width, because that is the only way that good sectional bond can be made, the height of the four courses does not affect the question of bonding, and they would like this left open, so that those who want five courses of bricks and five joints to the foot can have them. I think that it is obvious that the standard must fix all the dimensions of a brick, and that it would be very undesirable to leave the height out of the standard, but there is no reason that I can see why architects who want the thin bricks should not have them in spite of the standard if there was sufficient demand for fancy sizes. Brickmakers would, I presume, always be willing to make them to order, and in fixing the standard we have pointed out that it applies to walling bricks only, as we thought it would be unwise to try and standardise facing bricks, at all events for the present.

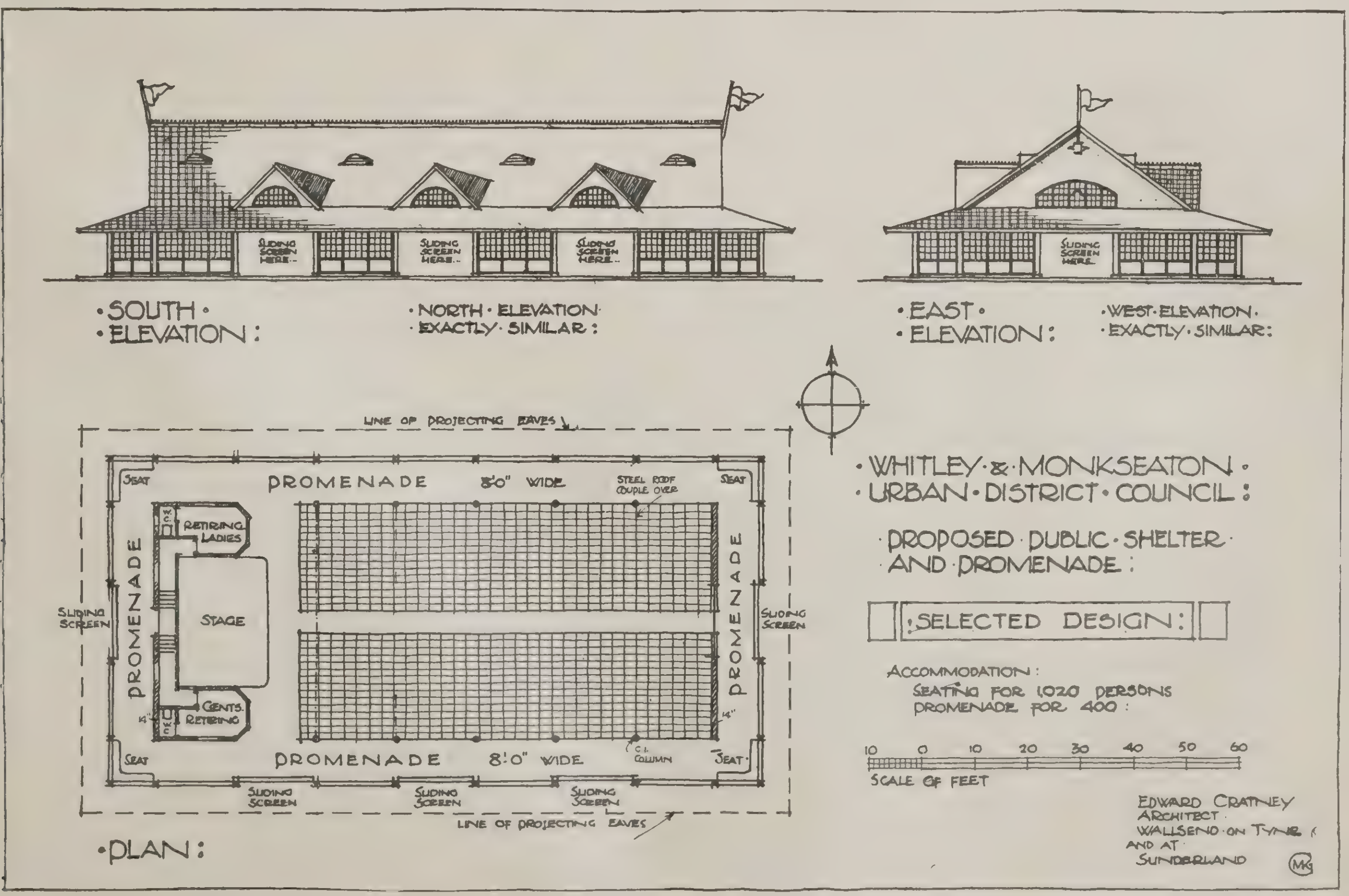
The margin in the measurements is intended to allow for the difference between the walling and ordinary facing bricks, while most builders want the full bricks that measure 9in. by 4⅜in. by 2 11-16in., with the 5-16in. bed joint, the minimum brick that measures 8⅞in. by 4 5-16in. by 2⅝in. with the ⅜in. bed joint, would suit nearly all the usual stock-sized facing bricks.

The Size of the Frog.

There is another question that will have to be settled sooner or later, and that is the size of the frog. In some of the glazed bricks the frog has been so exaggerated that a section of the brick looks like the letter H. It is obvious that the strength of the brick is seriously reduced, and when used where there is much weight, or exposed to the effects of fire, the face flies off. In order to meet this it was suggested to try a brick with three 1in. diameter holes. This would give 1 11-16in. bearing on each side, and 1½in. between the holes. These holes would be also excellent for grouting up perpends, and would help the bricklayer in cutting

---

*Part of a Paper on "Materials," read before the Architectural Association on January 8th, by Mr. H. D. Searles-Wood, F.R.I.B.A. The first part of the paper was published under the heading "Composition of Concrete and Bricks," on p. 23 of our issue of January 13th.



closers. Whether this would be open to the same objection as the perforated bricks with the smaller sized but greater number of holes I am unable to say; but these bricks are apt to fly when exposed to the effect of fire and water. The size of the frog is a serious item, also, now that so much brickwork is carried out with cement. The best form of frogs are the two square shallow sinkings; but, for brickwork in cement, bricks are often specially made without frogs.

Some few years ago Mr. Alan Munby drew up the following list of questions on building stones, and architects were invited to return the form filled up with a view to procuring a reliable reference on the subject of building stones. The following is the list that was circulated:—

Building Stones.

Strength Under Cross Strain.—Stone is a weight-carrier, with little transverse and less tensile strength. Use it, therefore, freely in compression, with caution in lintels, and never in tension. Bring pressure upon it at right angles to its natural bed, or in the case of slate to its line of cleavage.

Uses.—A careful study of stone is necessary to know what are the purposes each is best suited for. In London, Portland stone is considered the best, and other limestones, such as Bath, etc., are frequently used. The sandstones of Yorkshire and Forest of Dean are mostly used for landings and steps.

Chemical Analysis.—The value of this is the indication it gives of the lasting properties of the sample in sandstones. The nature of the cementing material which holds together the particles of silica is all-important.

Atmospheric Effects on Stone.

The sulphuric acid found in the atmosphere of large towns, the carbonic acid in the country atmosphere, will ultimately decompose any stone containing a large part of either carbonate of lime or carbonate of magnesia.

The oxygen of ordinary air will act on stone containing much iron. The average humidity of the neighbourhood in which the stone is to be used is another point, as the destructive acids penetrate more deeply into a wet than a dry stone, and the frost has a greater effect. The position of the stone also has a bearing on the question; stones that are always in the shade and never dried by the sun decay most rapidly.

Any stone exposed to very different degrees of heat on its different faces is liable to crush from unequal expansion and contraction, and for this reason stone buildings are not so fire-resisting as brick buildings, and in the tariff regulations for insurance are charged for accordingly.

Stone for Carving.

The readiness with which stone can be converted into the various shapes in which it is required for different kinds of work will depend in some cases upon its hardness, but will also be influenced by the soundness of its nature, by its freedom from flaws, and also by its natural cleavage. A soft stone of even grain and without distinct beds would naturally be selected for carved work, while a hard stone in thin layers easily separated would be well adapted for building good and economical rubble masonry.

The Hardness of Stone

is often of importance, but it does not follow that because a stone is hard it will weather well. Many hard stones are more liable to atmospheric influence than those of softer texture whose chemical composition is of more durable nature.

The Structure of Timber.

The structure of wood affords the only reliable means of distinguishing the different kinds. Colour, weight, smell, and other appearances which are often direct or indirect results of structure may be helpful in this distinction, but cannot be relied upon entirely.

Structure underlies nearly all the technical properties of timber, and furnishes an explanation why one piece differs as to these properties from another.

Structure explains why oak is heavier, stronger, and tougher than pine, why it is harder to saw and plane, and why it is much more difficult to season without injury. From its less porous structure alone it is evident that a piece of a young and healthy oak is stronger than the porous wood of an old or stunted tree, or that Georgian or long-leaf pine excels white pine in weight and strength. Keeping especially in mind the arrangement and direction of the fibres of wood, it is clear at once why knots and cross grains interfere with the strength of timber.

Hard Woods and Soft Woods.

Timber is furnished by two well-defined classes of trees: the needle-leaved naked seeded conifers (pines, cedars, etc.), and the broad-leaved trees (oak, poplar, etc.). The first are commonly called evergreens, the latter are known as deciduous trees. In the timber trade the woods of broad-leaved trees are known as "hardwoods," and the needle-leaved trees as "soft woods."

In the manner of growth both conifer and broad-leaved trees behave alike, adding each year a new layer of wood, which covers the old wood in all parts of the stem and limbs. Thus the trunk continues to grow in thickness throughout the life of the tree by additions (annual rings) which in temperate climates are, barring accidents, accurate records of the tree.

Sap-wood and Heart-wood.

Examining a smooth cross section or end face of a well-known log of Georgian pine, you can see an envelope of reddish scaly bark, a small whitish pith at the centre, and between this the wood in a great number of concentric rings. A zone of wood next to the bark one to three or more inches wide and containing thirty to fifty or more annual rings, is of lighter colour. This is the sap-wood, the inner or darker part of the log being the heart-wood. In the former many cells are active and store up starch and otherwise assist in the life processes of the tree, although only the last or outer layer of cells (the cambrium layer) forms the growing part and the true life of the tree. In the heart wood all cells are lifeless cases, and serve only the mechanical function of keeping the tree from breaking under its own great weight or from being broken by the wind. The darker colour of the heart-wood is due to infiltration of chemical substances into the cell walls, but the cavities of the cells in pine are not filled up as is sometimes believed. Sap-wood varies in width and in the number of rings which it contains. Even in different parts of the same tree, of the same year's growth, what is sap-wood in one part of a disc may be heart-wood in another. In a pine 250 years old, a layer of wood or annual ring does not change from sap-wood to heart-wood until seventy or eighty years after it is formed, while in a tree 100 years old or less it remains sap-wood only from thirty to sixty years Occupying the peripheral part of the trunk, the proportion which sap-wood forms of the entire mass of the stem is always great. Thus even in old trees of long-leaf pine the sap-wood forms about 40 per cent. of the merchantable log, while in young trees the bulk of the wood is sap-wood. Holding a well-smoothed disc ⅛in. thick towards the light, it is readily seen that pine-wood is a very porous structure. If viewed with a strong magnifier, the little tubes, especially in the spring wood of the rings, are easily seen, and their arrangement in regular, straight radial rows is apparent. Scattered through the summer wood portions of the rings, numerous irregular greyish dots (the resin ducts) disturb the uniformity and regularity of the structure. The total length of these fibres is 1-20in. to 1-5in., being smallest near the pith, and is 50 to 100 times as great as their width. They are tapered and closed in at their ends, and thin walled, with a large cavity or internal space in the spring wood; while they are thick-walled and flattened radially, with the internal space much reduced, in the summer wood. The flattening together with the thicker walls of the cells produces the greater firmness and darker colour—that is to say, there is more material in the same volume.

Medullary Rays.

The dark lines in the side of the smaller piece appear when magnified as tiers of eight to ten rows of cells lying in vertical radial planes, and are seen as bands in the radial face. These bands are the "medullary rays," and are common to all timber woods. In the pines they are quite small, but they can be readily seen even without a magnifier if a radial surface of split wood (not smooth) is examined. The entire radial face will be seen almost covered with these tiny structures, which appear as fine but conspicuous cross lines. The cells of the medullary rays are smaller and very much shorter than the wood fibres, and their long axis is at right angles to that of the fibres.

The large vertical resin-ducts are best observed on the removal of the bark from a fresh piece of white pine cut in winter, when they appear as white lines. Neither the horizontal nor the vertical resin-ducts are vessels or cells, but are openings between cells, that is, intercellular spaces in which the resin accumulates, freely oozing out when the ducts of a fresh piece of sap-wood is cut. They are present only in coniferous woods.

Broad-leaved Trees.

On a cross section of oak the same arrangement of pith and bark sap-wood and heart-wood may be seen, and the same disposition of the wood in well-defined concentric rings, but the rings are marked by lines or rows of conspicuous form or openings which occupy the greater part of the spring wood, and are, in fact, the openings through the vessels cut by the section. On the radial section the several layers appear as so many parallel stripes in the tangential face; patterns similar to those mentioned for pines are seen. But while the pattern in hard pines are marked by the darker summer wood and are composed of plain alternating stripes of darker and lighter wood. The figures on oak are due chiefly to the vessels, those of the spring wood being the most conspicuous, so that the darker shaded parts are the spring wood, the lighter parts the summer wood. Scattered through the radiating grey patches of porous wood are vessels similar to those of the spring wood, but decidedly smaller. These vessels are usually fewer and larger near the spring wood, and smaller and more numerous in the outer portion of the ring. Their number and size can be used to distinguish the oaks classed as white oaks from those classed as black and red oaks. The summer wood, except for these radial greyish patches, is dark-coloured and finer. This finer portion, divided into bodies of strands by thin patches of porous wood, and also by fine wavy concentric lines of short, thin-walled cells, consists of thick-walled fibres, and is the chief element of strength in oak wood. In good white oak it forms one-half and more of the wood; it cuts like horn, and the cut surface is shiny and of a deep chocolate-brown colour. The large medullary rays in oak are often twenty and more cells thick, and several hundred cells in height.

Discussion.

In the discussion following Mr. Searles-Wood's paper, Mr. W. H. White proposed a vote of thanks to the lecturer. He knew, he said, that the study of materials was not so fascinating as that of design, but it was nevertheless a most important part of the architect's education. A personal instance might perhaps be of some value. He had recently been consulted in regard to some plastering which had been condemned by a surveyor, who attributed the defect to bad sand. The surveyor had made no experiment whatever, but merely pronounced the sand to be of bad quality from a cursory inspection. He (Mr. White) had then conducted an experiment which proved that neither the sand nor the lime was in fault. This exposed the fallacy of condemning before examination, and the value of the ability to prove a contention by demonstration. Mr. Searles-Wood's paper gave in a concise form a vast amount of information. He advised students to get the paper in printed form.

Mr. Matt. Garbutt seconded the vote of thanks

Mr. Hampden, Mr. Pratt, and Mr. H. D. Satchell also spoke.

The President summed up the discussion and invited Mr. W. H. Wihte to give a detailed account of the experiment to which he had referred; a request with which Mr. White complied.

Mr. Searles-Wood, responding to the vote of thanks, referred to his first paper on materials, delivered at the A.A. nearly thirty ago.

Proposed New Works.

ABERGAVENNY.—The Town Hall is to be extended and improved at an estimated cost of £2,500. Mr. E. A. Johnson has prepared the plans, and an application to the L.G.B. is in hand.

AMERSHAM.—The Rural District Council has approved plans for the following:—New school, Whelpley Hill, Mr. C. H. Riley; house, Holloway Road, Chesham Bois, Messrs. Hooper and Nash; house, Austenway, Chalfont St. Peter, Messrs. Johnson and Boddy; alterations and additions, The Lawns, Pollards Wood, Mr. G. E. Nield; alterations and additions to house, Chesham Bois, Mr. F. G. Rust; two houses, Parkfield Avenue, Amersham, Mr. B. Stone, Chesham.

BIRMINGHAM.—The L.G. Board enquiry has been held into the applications of the City Council for a loan of £4,665 for the extension of the City Library, and for a loan of £3,411 for laying out a portion of the Black Patch as a recreation ground.

BLACKBURN.—The Town Council approved of the following building plans:—Hall, Dock Street, by Mr. J. Yates (conditionally); three houses, Sapphire Street, by Mr. John Riding; sludge pressing house, Eccleshill Road, by the Darwen Paper Mill Co., Ltd.; four houses, Cabin End Road, by Mr. John Smithson; 15 houses, Audley Range, by Messrs. T. Charnley and Son; new streets, Little Harwood, by the Exors. of J. F. Armistead; stable, Sandy Lane, by Messrs. T. P. Willson and Sons; two houses, Hollin Bridge Street, by Mr. W. Wilkinson; two houses, Gorse Road, by Mr. James Crank; eight houses, Eldon Street, by Mr. Hy. Thompson; and two houses, Markham Street, by Mr. L. H. Maxwell.

BRENTFORD.—The vicar of St. Paul's Church has obtained a faculty for the erection of a side chapel to that church.

BRIDLINGTON.—The town council are applying for a loan of £10,670 for the erection and equipment of new elementary schools in the Old Town Ward.

BROMLEY, KENT.—The Town Council have approved plans for the following:—Messrs. Potter and Harvey's plan of additions, Lyncroft, Cromwell Avenue; Mr. E. Hellicar's plan of house, Blenheim Road; Mr. V. Wilkins' plan of additions, Miramar, Madeira Avenue; Mr. F. G. Crickett's plan of workshop, Napier Road.

BURY ST. EDMUNDS.—The Town Council are about to convert the town hall into additional municipal offices and to carry out various other alterations from plans prepared by the Borough Engineer. The cost is estimated at about £1,500.

CARDIFF. The Schools Management Committee are looking for a site for a new school in the Canton (Riverside) district.

CARRON, SCOTLAND.—A public hall is to be erected here, and plans are being prepared.

DARLINGTON.—It is proposed to erect a number of almshouses here at a cost of £3,000. This sum is to be borrowed from the Public Works Loan Commissioners, to be repaid out of the income accruing from Buck's and other charities, which are to be diverted to this purpose by sanction of the Charity Commissioners.

EXETER.—At a cost of about £10,000, the Asylums Committee of the City Council are about to extend the City Ayslum.

GILLINGHAM, KENT.—The Town Council has approved plans for the following:—Four houses, Chatsworth Road, for Mr. Virtor Tewell, submitted by Mr. Frederick D. Pott; Sunday school, Byron Road, for the Building Committee of Wesleyan Church, submitted by Mr. G. E. Bond; Bungalow, Lidsing Road, Hempstead, for Mr. R. L. Gorf, submitted by Mr. Newnham; sixteen houses, Eva Road, for Mr. Richardson.

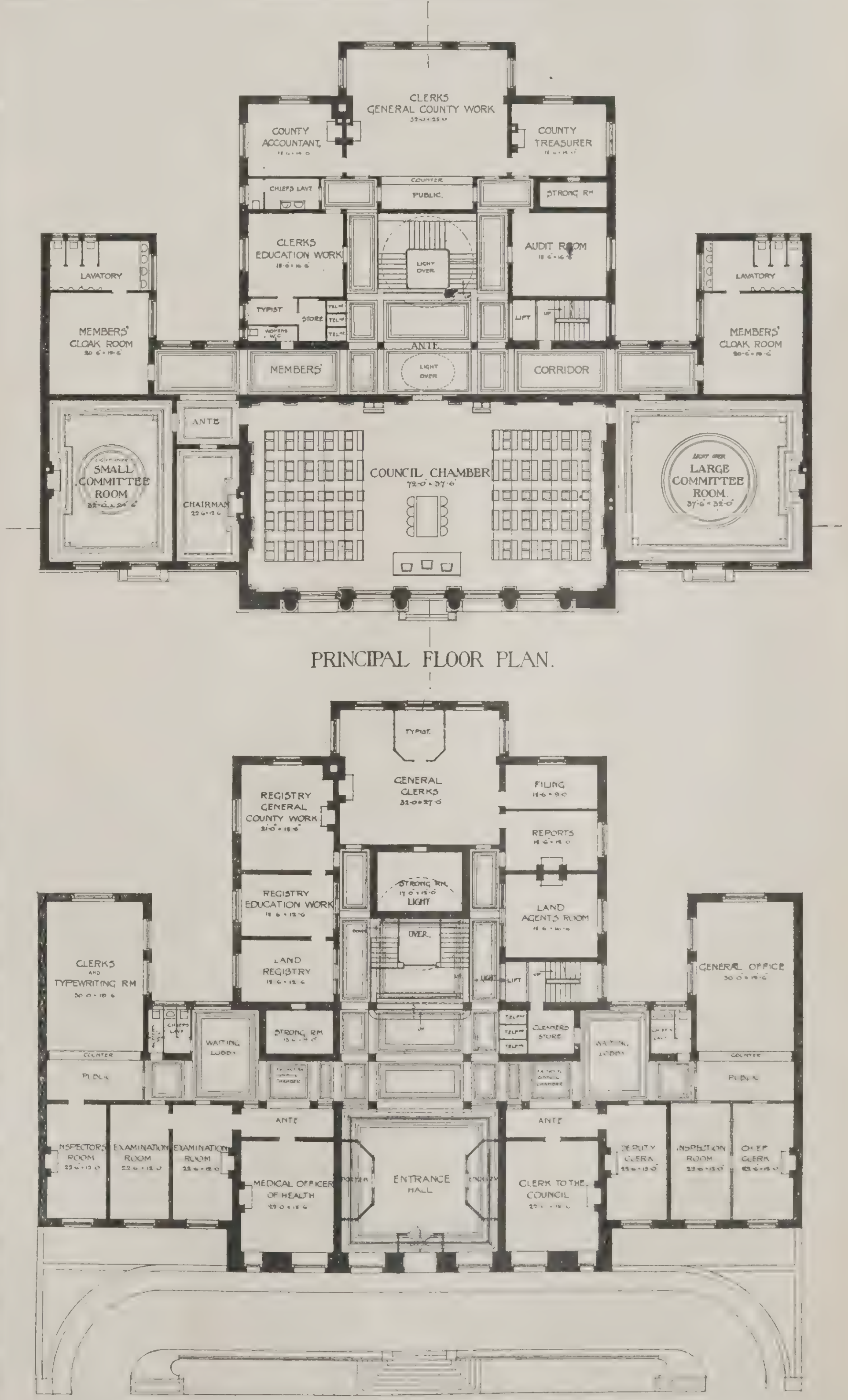
GLOUCESTER.—Plans for the extension of the Shire Hall have been passed by the Gloucestershire County Council, and the tender of Mr. J. Moyes has ben accepted for clearing the site.

HARROGATE.—The L.G. Board has held an enquiry into an application by the Corporation for a loan of £8,850 for the extension of the royal baths.

HUNTINGDON.—The Town Council has been considering the question of a possible site for a County Hall, upon which they are conferring with the County Council.

KIDSGROVE.—The girls' national school is to be rebuilt at a cost of more than £1,500.

LEICESTER.—The L.G. Board has held an enquiry with an application of the Town Council for sanction to borrow £8,500 for the extension of the Town Hall, £1,508 for the erection of firemen's cottages in Colton Street, £4,100 for the purchase of land in Newarke Street for the purposes of street improvement, and £752 for works of sewer-



DESIGN FOR A COUNTY HALL; GROUND AND PRINCIPAL FLOOR PLANS. COLIN J. MACDONALD AND J. HAROLD SAYNER, A.R.I.B.A., ARCHITECTS.

age in Norton Street and Lower Brown Street.

LONDON.—There is a new scheme in the air for erecting an immense hall, larger than Olympia, as a permanent home for the international horse show. The syndicate at the back of the scheme is looking for a site of seven acres in the West End.

LONDON: DEPTFORD, S.E.—The Borough Council has secured a site for a new branch public library in New Cross Road, nearly opposite All Saints' Church. Mr. Andrew Carnegie has promised £4,500 to defray the cost of the building.

LONDON: MUSWELL HILL, N.—The Ecclesiastical Commissioners have allocated a sum of £10,000 for the erection of a permanent church in place of the temporary one of St. Peter, Colney Hatch Lane.

LOUTH, LINCOLNSHIRE.—The Local Antiquarian Society are about to erect a museum here, the Town Council leasing the Society a site in Enginegate for this purpose.

MONIFIETH, SCOTLAND.—The Town Council are looking for a site for new municipal buildings.

POOLE.—The Town Council has approved plans for the following:—Two houses, Birchwood Road, J. Wright, per T. E. Grimes; three houses (revised plan), Junction Road, A. and F. Wilson, per W. Andrew; house, Ravine Road, E. Wilson, per T. Stevens; house, Dalketh Road, Hawker and Mitchell, for W. E. Jones and Sons; house, Ettrick Road, Smart and Wyeth, for F. King Hall; road off Salisbury Road, E. E. Clarke, for G. Parsons; house, Munster Road, T. E. Grimes, for J. Wright; roads at Sandbanks, H. F. J. Barnes, for Harbour Commissioners; cottage, No. 1, Pope's Farm, small holding, T. R. Sanders, for Lady Wimborne; two houses, Kingland Road, R. B. Eaton; pair of semi-detached houses, Kingland Road, R. Williams for Mrs. Williams; houses, Rossmore Road, S. Yeatman for T. Whitfield.

SUNDERLAND.—The Town Council is contemplating the immediate extension of the Town Hall. The scheme has been in hand a considerable time, a competition having been held as far back as 1903-4, for the extension, the successful design being that of Messrs. Wills and Anderson, of London. In this design the elevation of the present building is continued with a replica of the present tower to preserve the symmetry of the completed buildings.

SWINDON.—The Town Council have approved plans for the following:—Mr. A. J. Colborne, drainage of streets and back roads, Kingshill Estate; Mr. A. J. Colborne, 11 houses, Kent Road; Messrs. J. Hepworth and Son, Ltd., alterations, 36, Bridge Street; Mr. G. M. C. Wade, plan of additions, 25, Fleet Street.

UPPER RENFREWSHIRE.—At the meeting of the Buildings Committee of Upper Renfrewshire, intimation of the intention to erect the following buildings was given:—Double cottage in Belmont Avenue, Giffnock, for John Taylor, Eddlehurst, Larkhall; terrace of four houses in new street off Bushby Road, Giffnock, for James M'Luskie, 37, Bath Street, Glasgow; villa in Greenhill Avenue, Giffnock, for James Hill, 54, Terregles Avenue, Pollokshields; villa in Merrylea Road, Newlands, for John M'L. Dennistoun, 656, Alexandra Parade, Glasgow; and two tenements, in Dumbarton Road, Yoker, for Messrs. William M'Neill and Co., 301, Victoria Road, Glasgow.

WALLSEND.—The Town Council have approved plans for houses and shops to be built in High Street for Mr J. MacHarg.

WIMBLEDON.—The Town Council have debated the question of extending the present municipal buildings or building fresh ones. The probable respective costs of these two proposals are to be ascertained and reported.

WATERFORD, IRELAND.—A conference of authorities, including the South Tipperary County Council, the North Tipperary Council, the Kilkenny County Council, the Wexford County Council, the Waterford County Council, and the Waterford Corporation, has been held to consider the erection of the new Waterford Bridge, for which these authorities will be assessed as contributors. It was decided to employ an eminent expert engineer to suggest an alternative scheme, less costly than that proposed by the vice-regal commission.

WOKING.—A technical institute and boys' secondary school is to be erected here by the Surrey Education Committee at a cost of £21,000.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Jan. 31	*SOUTH BANK - IN - NORMANBY. Town Hall, Council Offices, etc., for the Urban District Council. Particulars of the Clerk, Town Hall South Bank, S.O., Yorks.
Mar. 17	NEW OFFICES FOR THE STANLEY U.D.C., DURHAM. Cost £3,500. Premiums £30, £20 and £10. Conditions, etc., to be obtained from J. G. Ridley, Clerk to the Council. Stanley S,O., Co. Durham.
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days.
No date.	PONTARDAWE (WALES). Offices for the Guardians, in Holly Street. Premium £10 10s. The premium is offered by the Guardians "for plans with abridged specification, *which in their judgment* are best suited." Particulars and conditions from C B. Jenkins, Clerk, Herbert Chambers, Pontardawe, S.O., Glamorganshire.
No date.	BLACKBURN. The Blackburn Small Holdings and Allotments Committee have decided to invite architects and surveyors in the Borough to submit competitive plans for the laying-out of the estate at Oswaldtwistle, recently purchased for small holdings. Premiums of £25, £10, and £5 are offered.

**The R.I.B.A. Council has requested Members to refrain from competing.*

Law Case.

Crucifix on Roof Loft.—Question of Legality.

In the London Consistory Court, on Thursday last, the Chancellor of the Diocese (Dr. Tristram, K.C.) heard, and reserved his judgment in, an application which, he said, was the first of its kind that had come before him during the time that he had been Chancellor. It was made by the Rev. Walter Forster, vicar of St. Paul's, Bow Common, who appeared to support a petition praying for a faculty authorising the erection of a rood beam in his church. No one attended to oppose the application.—Dr. Tristram read the petition, from which it appeared that a vestry meeting, held in November last, had resolved to accept the offer of a rood beam to be given in memory of Ellen Jeffrey, and to apply for a faculty to erect it. The alteration proposed to be made in the church was thus described:—"To erect a beam, enriched with gold cresting, across the entrance to the chancel, with the following inscription on its base and scroll: 'O Lord God, Lamb of God, son of the Father, that takest away the sins of the world,' made out to each end with vine foliation in gold on green ground. On a central cross the figure of our Lord (Archbishop Benson's rendering), crowned and reigning on the tree, and idealised figures of the Virgin and St. John, the latter with his emblem carved in pear-wood of gilt and coloured work." The estimated cost was £272, and, in reply to the Chancellor, the vicar said that the Jeffrey family were formerly parishioners, and, when residing in the parish, attended the church.—Mr. J. R. C. Smith, an architect, stated that the crucifix would be 13ft. 10ins. high, and the figures would each be 3ft. 6ins. in height. Both the crucifix and the figures would be left in plain wood. The Chancellor said that the question of whether such a rood loft with a crucifix upon it might be erected came before Lord Penzance in the case of Clifton v. Ridsdale, and Lord Penzance made some remarks unfavourable to its erection. Those observations were appealed against to the Judicial Committee of the Privy Council. That, however, was 30 years ago. Before he gave his judgment, he would have to consider whether, after the decisions of the Court of Arches and the Judicial Committee of the Privy Council, he would be justified in granting the faculty. He would also have to consider whether he would be justified in granting a faculty in the exercise of his discretion. He would, therefore, reserve his decision, and would deliver a written judgment at a later date.

Notes and News.

A proposed University of Hong Kong, of similar constitution to the Universities of Leeds and Birmingham, is to be built at a cost of £58,000, provided that the public subscribe, within six months, the sum of £110,000 required for endowment and equipment. Mr. H. N. Mody, a leading Hong Kong broker, has made this conditional offer.

* * *

That man "has a tendency to adhere to architectural forms," a writer in a daily contemporary finds evidence in "the round huts of African savages and the wigwams of Indians." He notes, however, that all builders are not hopelessly conservative: "The gulls, for example, abandoning the flimsy seaweed structures on the beach for tree-nest building." This ornithological example of architectural development is no doubt very encouraging to the featherless biped; but one would have been grateful for a more auspicious bird than the maligned gull.

* * *

Mr. George Thomson, who, besides being an admirable painter, is a very keen chemist, has, it appears, discovered a medium which resists moisture, thus securing fugitive pigments such as white lead from the ruinous action of sulphuretted hydrogen. "Those who recently saw him demonstrate the value of his production," a daily contemporary reports, "wondered whether the Van Eycks' secret had at last been revealed—the secret which enabled them to paint with colours which remain to-day as fresh as when applied five hundred years ago."

* * *

In a couple of months, what are probably the largest covered reservoirs in the world will be opened at Honor Oak. They cover 21 acres and have a storage capacity of 56,500,000 gallons. The first operation in their construction was the making on the site of some 18,000,000 bricks, all of which have been used.

* * *

London's Fires in 1908.—In London during 1908 the Fire Brigade received 5,186 calls, including false alarms and chimney fires. The greatest number of calls received in one day was 37—on Christmas Day. Forty-four lives were lost owing to fires during the year, and 36 persons who were removed alive from burning buildings by the firemen died afterwards in hospitals and infirmaries. The greatest fire of 1908, so far as damage was concerned, broke out on August 4th, at 48, Old Bailey, in a huge building of six floors used as show rooms, offices, and stores by leather goods manufacturers, and booksellers This place was destroyed, two adjoining buildings were seriously damaged, and six other sets of premises adjoining were injured.

At Marylebone Borough Council meeting, on Thursday, Councillor E. A. Debenham, chairman of the Electric Supply Committee, moved that a loan of £8,000 be sought from the London County Council to execute works for the substitution of electric for gas lighting of 1,964 public lamps in streets where electric mains have already been laid. The motion was adopted. It was stated the annual charge for electricity supplied would be £7,350, or £600 less than the terms offered by the Gas Light and Coke Company for the supply of gas.

* * *

A deputation from owners and occupiers of property in Southampton Row waited upon the Holborn Borough Council, on Thursday, to present a petition urging opposition to proposals contained in the London County Council (General Powers) Bill allowing the latter body an extension of time for the purchase of premises in Southampton Row in connection with the suggested widening of that thoroughfare. The matter was referred to a committee.

* * *

All talk of rebuilding Messina is, according to a newspaper correspondent, premature, to say the least. He does not think that the ruins can be cleared away so as to free the ground in less than two or three years. On the other hand, it seems to be the rule that a town should always be rebuilt on the site where it was destroyed, or next door at most, owing to geographical conditions, etc. It is furthermore urged that in rebuilding the Japanese system should be adopted in those regions. Some people, however, are of opinion that to expect men to build in other than the way their fathers have built is like asking beavers to make their nests on the trees or the swifts to leave the old towers of Rome and haunt the woods and riversides.

* * *

Arrangements are being made by the National Housing Reform Council for a visit of inspection to German cities during next Easter week. The object is to obtain first-hand information on town-planning schemes, such as is likely to be useful when Mr. John Burns's Bill on the subject becomes law, and is put into operation in this country. For that reason the tour will be confined to cities like Cologne, Dusseldorf, and Frankfort, which supply some of the best German examples of town planning. Several of the leading British municipalities are expected to be represented in the party which the Housing Reform Council is organising, and assurances of hospitality are forthcoming from public bodies in Germany. The President of the Local Government Board is to be invited to join the tourists.

R.I.B.A.

PRIZES AND STUDENTSHIP AWARDS.

At the meeting on Monday the awards of the various prizes and studentships were declared as follows :—

Institute Silver Medal and 25 Guineas, for an essay on "The Influence on Architecture of Modern Methods of Construction."

1. "Void," Henry H. Hill, B.A., Bayswater, W.
2. (£10 10s.) to "Viota Nuova," Horace Cubitt, A.R.I.B.A., Strand, W.C.
3. (Hon. mention) "New Lamps for Old," J. Maclaren Ross, A.R.I.B.A., London, W.C.

Institute Silver Medal and Ten Guineas, for set of measured drawings of Ancient Buildings in the United Kingdom or abroad :—

1. "San Gallo" (6 strainers, Church of the Madonna di San Biagio, Montepulciano); Ernest W. Wray, York.
2. (Medal of Merit), "Flint" (5 strainers of Lavenham Parish Church); Alan G. Brace, Lapworth, Warwicks.

The Soane Medallion and £100 (for Continental Travel).

Subject :—Design for a Casino on the borders of a lake :—

1. "Red Seal" (device), 5 strainers; Anthony R. Barker, Harrow.
2. (Hon. mention and £21) "Centrelines," 5 strainers, Adrian Berrington, London, W.C.

The Owen Jones Studentship, Certificate and £100 (for travel and study of colour).—

One application, that of Mr. S. Herbert Maw, was received (6 strainers). The studentship was not awarded, but £21 was given to Mr. Maw in recognition of merit.

The Pugin Studentship, Silver Medal and £40 (for travel in the United Kingdom).

1. Sydney H. Miller (4 strainers).
2. (Hon. mention and £10 10s.) H. Hubert Fraser (4 strainers).

The Tite Prize: Certificate and £30 (for Travel in Italy).

Subject set :—Design (according to the Principles of Palladio, Vignola, Wren, or Chambers), for a covered arcade of shops.

1. "Clarion," 3 strainers, Richard W. N. Gunn, Glasgow.
2. (£15 15s.) "Last Man In," 3 strainers, Bertram Edwin Lisle, Wandsworth, S.W.
3. (£10 10s.) "Dezzezero," 3 strainers, S. Herbert Maw, Hull.

The Arthur Cates Prize; £42.

One application has been received—from Mr. Leslie Wilkinson (6 strainers), to whom the prize has been awarded.

Grissell Gold Medal and £10 10s.

Subject set :—Design for a landing stage to a Royal Palace from a lake :—

1. "Dies," 6 strainers, Douglas William Day, Leicester.

Godwin Bursary: Silver Medal and £65.

J. A. Allan: 5 strainers.

PUBLIC ABATTOIRS *

The Moral View.

From a humanitarian point of view it is our bounden duty to animals that they should be killed as painlessly and under the best conditions possible; it is a duty to ourselves that meat supplied for human consumption should be free from disease; that those places in which the work of slaughtering and dressing meat foods take place should be as hygienically perfect as possible; and it is an important matter of policy that by-products and other valuable materials should be utilised to their fullest extent. These essentials can only be achieved by the establishment of public abattoirs throughout the country, and by the elimination of private slaughter-houses.

Opportunities for Designs.

When the public abattoir system is established as firmly here as it is to-day on the Continent, there will be a very wide field open for the English architect to design these utilitarian but certainly complex buildings, well planned and with a distinctive character.

In England and Wales to-day we have nominally about ninety-eight public abattoirs, but nearly two-thirds of the buildings are very small, or obsolete in planning; in fact, a large number cannot be really seriously considered as public abattoirs at all. Even if they were all satisfactory this number would represent one institution to about every 330,000 inhabitants. As a matter of comparison, taking one-third of the existing abattoirs as being reasonably representative buildings, we have to-day in England and Wales one public abattoir to each million of the population. It is therefore apparent that we have hardly reached the fringe of an "abattoir system." In Paris to-day there are two splendid municipal abattoirs, supplying the meat for the whole of the city, and not a single private slaughter-house. In London alone to-day we have about 294 private slaughter-houses and not a single municipal one.

Private Slaughterhouses.

The author showed the disposition of the private slaughter-houses, licensed last year by the London County Council, in the area covered by the map published in the London Directory. There are 222 private slaughter-houses in that area, and in nearly every case they are in the midst of residential property. The fact that they should exist at all, many in populous districts and surrounded by houses, is an offence to humanity, hygiene, and economy. We pride ourselves on the enormous strides we have made in sanitary science during the last fifty years, but on this particular subject we are at least a century behind our Continental neighbours. Recently plans have been prepared for a public abattoir in Constantinople, and the work either has been or shortly will be commenced. When this has been accomplished, London will stand in "splendid" isolation by being the only European capital without such an institution.

The author enumerated the many defects inseparable from the system of scattered private slaughter-houses, and showed how they can be, and are, prevented in the public abattoir. Almost invariably on the Continent (and sometimes in England) these buildings are erected in the suburbs, and in close proximity to a railway, so that the necessity for driving animals through the streets does not exist. Diseased meat sold for food is practically unknown owing to the employment of fully qualified veterinary inspectors, who are continually on the spot while animals are being killed. Wanton cruelty is reduced to a minimum, as the municipal buildings are under the fierce light of publicity, the officials are continuously in attendance, and only trained men are engaged as slaughterers.

The Question of Finance.

Having dealt with the question of finance, and given statistics to show that public abattoirs can be made self-supporting or even profitable, the author set out the salient points to be observed in a well-planned abattoir. The existing buildings of this kind can be, broadly, divided into two classes, those on the "block system," where all the main departments are under one roof, and the "separate system," where the main buildings are separated by roads or passages. The main buildings of a moderately-sized abattoir consist of lairs for various animals, slaughter-hall, cooling-room, administrative block, superintendent's house, cold stores and chill-rooms, destructor, buildings for the preparation of by-products and offal, workmen's mess rooms, kitchen, bath, etc., and pathological room.

French and German Examples.

The author described the magnificent cattle market and abattoir of La Villete, Paris, designed by M. Janvier, and opened in 1867, and showed illustrations of the various markets, buildings, and slaughter-courts. The area is 105 acres, and about two and a half million animals are killed there per annum.

Illustrations were shown also of three typical German abattoirs, viz., those at Berlin, Leipzig, and Offenbach. Some of the Continental abattoirs are among the finest buildings erected. While Birmingham spends nearly 5s. a head for its abattoir, the little town of Offenbach in Germany, for instance, has spent £1 13s. 7d. per head of its 60,000 inhabitants.

British Abattoirs.

Turning to English abattoirs, the author considered the plan of the abattoir at the

---

*Summary of the Paper by Mr. R. Stephen Ayling (F.), read before the Royal Institute of British Architects, 18th January, 1909.

Dockyard, Chatham, most perfect, not only from the humanitarian point of view, but as regards facilities for working. The plan is the outcome of a report of the Commission appointed by the Admiralty to inquire into the question of the "humane slaughtering of animals," and the many witnesses examined were all experts engaged in those trades and professions appertaining to the subject. The main points in the report were as follows: "That animals awaiting slaughter should be spared any contact with the signs or smell of the slaughter-house; that waiting-pens should be separated from the slaughter chamber by sliding doors; that floors should be impervious and not slippery; that cattle should be slaughtered screened off from their fellows: that immediately the carcases have been bled they should be dressed in an adjoining chamber, screened off from view of animals entering the slaughter-house." These recommendations have been admirably carried out at Chatham. The buildings were designed in the Admiralty Office under the superintendence of Mr. J. Brooker Hunt

Plans, elevations, and in some cases photographs of a number of public abattoirs in England, including a unique plan suggested by the Model Abattoir Society were exhibited, and points of interest called attention to.

In Scotland to-day, out of 206 burghs, 124 of them, or nearly 61 per cent., have public abattoirs and greatly added powers for closing the private slaughter-houses. The Local Government Board of Scotland is now advocating the erection of public abattoirs in or near all towns. A radius of five miles is suggested for towns with from 6,000 to 8,000 inhabitants. Scotland is much in advance of England, and is generally approaching an "abattoir system."

The Question of Materials.

As regards materials, in the erection of these buildings wood should be used only where absolutely necessary. Stability and facilities for scrupulous cleanliness must be the keynote. The floors must be of perfectly impervious material, and white glazed brickwork or tiles largely used in the interior of the buildings, so that every trace of dirt or blood may be easily detected and removed. Throughout the buildings very light paint—preferably white—should be employed.

The question for or against public abattoirs appears to the author to be a national rather than a political one. He was strongly of opinion that a general "abattoir system" would encourage the British farmer to raise home-grown cattle, which would not only be to his pecuniary advantage, but also benefit the British consumer.

To trade opposition and vested interests the author attributed the fact that public abattoirs have not superseded private slaughter-houses in this country. Trade opposition is very strongly against the abattoir system, as under it inspection of meat would naturally be more stringent than is possible at the present time, so that diseased meat food would be condemned in a much greater proportion.

Official Architecture.

In some concluding remarks reference was made to the question of "official architecture" in connection with the subject. Abattoir buildings complying with various requirements, complex enginering work, elaborate sanitary work, considerations of humanity in stabling and slaughtering, the most efficient methods of veterinary inspection, etc., all tend to render them practically impossible to be designed by a single individual, however talented. In any large abattoir scheme the architect, engineers (constructional and municipal), medical officer of health, and veterinary surgeon should work together harmoniously.

INSTITUTE MEMBERS' CLUB.

A meeting of the Institute Members' Club will be held in the smoking room of the R.I.B.A. on Thursday, January 28th, at five o'clock p.m.

THE ABBEY MEMORIAL TO LORD SALISBURY.

The national memorial to the late Marquess of Salisbury will be placed in its position in Westminster Abbey in the early summer, probably about the end of May. A site has been selected for it just inside the west door on the left, immediately under the north-west arch, close to the statues of the Earl of Shaftesbury and Charles James Fox. The memorial is the work of Mr. Goscombe John, and it is regarded as being one of this sculptor's finest achievements. The figure of the late marquess is represented reclining, wearing the robes and insignia of the Garter, with the "George" attached to the collar. The right hand is extended on his side, and the left is on his breast holding a crucifix, on the arms of which are the symbols of the Evangelists. Attached to the cushions on which the head rests are two shields bearing the arms of Trinity House, of which the late marquess was an Elder Brother, and of the Cinque Ports, of which he was Warden. At the foot of the figure is a heraldic design representing St. George and the Dragon, with the oak leaf and two shields, bearing the Arms of Westminster College, of which the marquess was High Steward, and of Oxford University, of which he was Chancellor.

The altar tomb on which the figure will rest will be composed of polished black marble, with the sculptural and ornamental portions in bronze. On each side the altar tomb is an ornamental portico, under which stand three statuettes of ancestors of the late marquess, those on one side being Lord Burleigh, Lord High Treasurer to Queen Elizabeth, the central figure; on his right Robert Cecil, the first Earl of Salisbury; and on his left James, the second marquess, father of the late marquess. Robert Cecil holds in his hands a small model of a portion of Hatfield House, of which he was the builder.

The figures on the other side the altar tomb represent the ladies of the three ancestors:—Lady Mildred, wife of Lord Burleigh; Lady Elizabeth, wife of Robert Cecil; and Lady Frances, the mother of the late Lord Salisbury.

THE COMMISSION ON ANCIENT MONUMENTS IN WALES.

Sir John Rhys presided over the first meeting of the Royal Commission on Ancient Monuments of Wales, held in London on January 13th. Dr. H. Owen, F.S.A., who had taken part in an archæological survey in Pembrokeshire, said every ancient monument had been specially visited and every ancient camp surveyed. He considered that excavations were desirable under certain circumstances in order to ascertain the dates of monuments. At present there was no public place in the country where the surveys and other documents relating to ancient monuments were open to students and scholars. Ancient monuments had been wantonly destroyed or damaged at times, but not in recent years. Many monuments had been removed to churchyards for protection. Many people went from England to Pembrokeshire to see the ancient monuments, but more would no doubt go if the histories of the antiquities were more accessible. If photographs of antiquities were exhibited in schools, greater interest in the ancient monuments would be engendered. He did not think that many cromlechs had been removed from the country. There was a deep-rooted superstition with regard to their removal, as they were supposed to be the remains of druidical altars.

The Chairman: What is the superstitition?—That the person who removed a cromlech would lose a near relative—wife, if married—within a year, or that his crops would fail, or some other calamity happen.

Mr. George Evans, of Aberystwyth, stated that old Welsh castles are now carefully preserved, but there are still some which are used as the village hen-roost. Mr. Evans incidentally mentioned that he had walked 17,000 miles to visit historical monuments in Great Britain. The clergy of Wales were, as a rule, he said, careful custodians of the antiquities under their care, but some interesting screens had been swept away in Cardiganshire during the work of restoration, which, unfortunately, did not always mean conservation.

Mr. A. M. Palmer, who also gave evidence, expressed his opinion that the earthwork in Denbighshire known as Offa's Dyke was in reality a portion of the dyke built by King Offa.

MURAL DECORATION AT THE CENTRAL CRIMINAL COURT.

The mural paintings which Sir William Richmond, R.A., was commissioned by the Corporation of London to paint for the adornment of the Central Hall of the new Sessions House in the Old Bailey have just been completed, and the removal of the wooden staging reveals to full view three allegorical paintings, the subjects being "The Golden Age," "Roman Law," and "Spartan Law." The first of them, "The Golden Age," was finished at the time of the opening of the building by the King and Queen in 1907, during the mayoralty of Sir William Treloar. It is at the north end of the hall, and is a sylvan scene, with a company of nymphs dancing to the music of rustic pipes, typical of the golden age which was chosen to represent the ideal age when laws were not needed. "Roman Law" and "Spartan Law" are the paintings which have just been completed. They are on the east and west walls flanking "The Golden Age." That on the east represents Roman law under the king as chief magistrate. He is surrounded by the augurs and ædiles, while, seated, are the lictors with their wands of office. Behind is a temple of Ceres. On the raised stone floor are two columns with statues—one to Mars and the other to Justilia. The back ground is in the country round Rome, with the winding Tiber, and in the distance is the outline of the Tarpeian Rock. The heads of the augurs and others are portraits of celebrated men, Cicero among them. "Spartan Law," which is on the west wall, depicts Lycurgus, standing upon a shield on which are crossed spears, symbolical of peace. Behind him, in golden armour, are the kings of the various tribes, and flanking them are their councillors who record their votes by uplifted hand. Behind Lycurgus is a wooden gilt statue to Zeus, and among the figures are those of a plaintiff and a prisoner.

Our Plate.

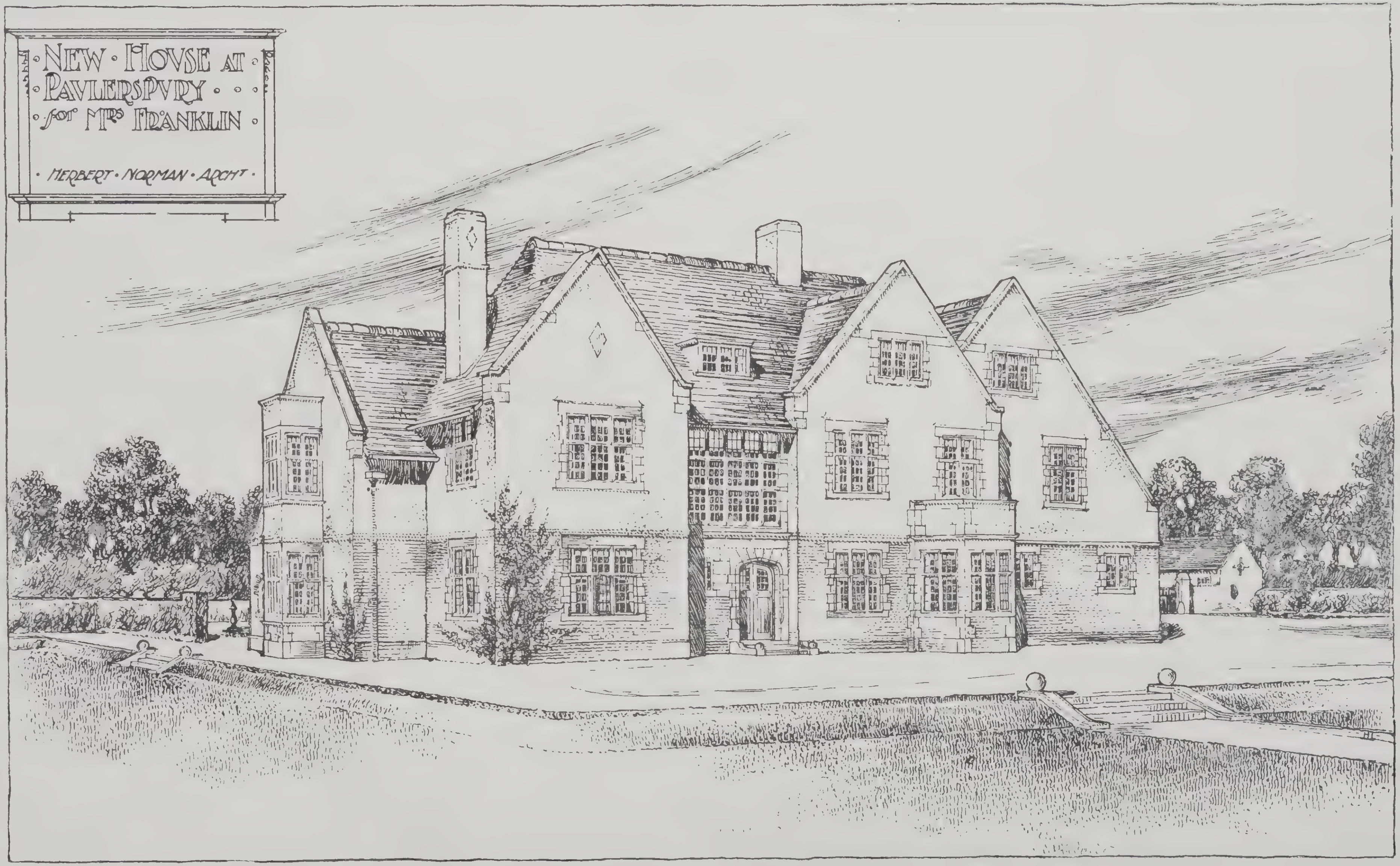
House at Paulesbury, Northants.

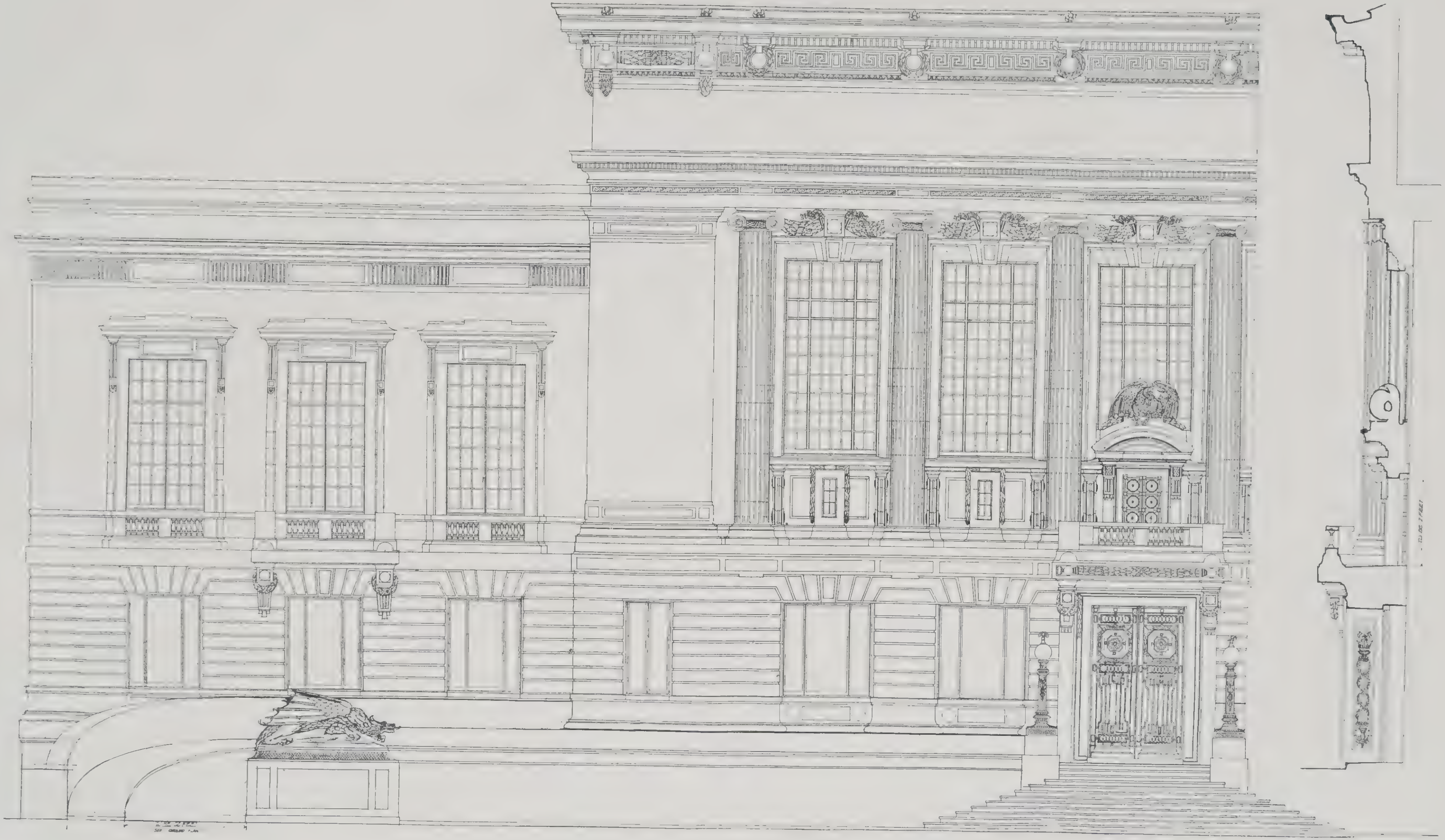
This house is to be completed early this year. It is in a fine hunting country, being within a short distance of "The Grafton Kennels," and faces the old Watling Street, along which is a continuous stream of motor traffic. Consequently the house has been well set back from the road to avoid the dust nuisance. The brickwork is of small, local building bricks, the upper part being rough-cast on hollow walls, with brindle coloured tiles on the roof. The adjoining stabling gives accommodation for ten horses. The builder is Mr. A. P. Hawtin, and the architect Mr. Herbert Norman, both of Northampton.

Design for a County Hall.

The conditions which governed this design did not present any great difficulty, but rather gave a good opportunity for simplicity in plan, and dignity in elevation. The main entrance and lift were to be on a level with the road. This difficulty was overcome by forming a sloping foot and carriage way from the extreme ends of the site. In this way the ground floor was raised about five feet—an essential point, increasing the dignity of the principal facade. The site formed part of well-wooded estate, and the main front faced a broad avenue or boulevard, where there was little traffic. These facts made it possible to have a dignified treatment of the facade, and to make the building express its purpose clearly. No light was obtainable at either side of the

Supplement to THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER, *Wednesday, January 20th, 1909.*





DESIGN FOR A COUNTY HALL. FART OF FRONT ELEVATION. COLIN J. MACDONALD AND J. HAROLD SAYNER, A.R.I.B.A., ARCHITECTS.

site, therefore the building was lighted from back to front, thus avoiding insanitary areas, and leaving ample space at the back for a drill ground, which was required. The council chamber was placed on the principal, or first floor. (See page 51.) The most important reason for this was, that it gave this room the required prominence, both internally and externally. It was approached from the vestibule by the grand staircase, and the facade expressed the purpose of the building in a dignified manner. An additional reason for placing the council chamber on the first floor was that of convenience. This arrangement allowed the whole of the ground floor to be devoted to those offices, frequently resorted by the public. The buildings already in existence on the adjoining sites were low, therefore the side wings were not carried up more than two thirds the height of the centre block.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

The querist's name and address must always be given, not necessarily for publication.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s., made payable to Technical Journals Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

Models for Honours Carpentry and Joinery.

SOUTHPORT.—SIDNEY writes: "Kindly oblige with a few suggestions as to the making of the model required in the City and Guilds examination in honours carpentry and joinery. Staircasing seems to me to be rather overdone. Information as to taking out the quantities would be also esteemed."

As stair-building undoubtedly represents the highest level of technical accomplishment in joinery, it is not remarkable that stairs are usually selected for the model in this examination. As a proof of capability, the subject cannot be improved upon; but if a change is wanted, a lantern light, with lay-lights under, might be acceptable. Instruction in quantity-taking can hardly be given within the limits of an enquiry column. There are many excellent text-books on the subject.

G.

Building Line Question.

LONDON, S.W.—C.A.S. writes: "Please advise on the following particulars:—Land upon both sides of a new roadway in district thirteen miles from London (Sutton), no houses on either side of the road. Building line made by owner of land, who also made the road fixed at 35ft. If house erected more than 35ft. back, say, 100ft., will this, being the first house erected upon the land, establish a frontage line for any other houses to be erected? Solicitors advise me yes; I say no, surely not. Cannot owner of land, or purchaser of any plot, erect his house wherever he thinks fit beyond the frontage line Should solicitors (as above) view be correct, and purchaser of land insists upon his house being set back, and plans not yet passed by Council, or ever yet submitted, would it be consistent with the case and hold good if purchaser of land had built a portion of his wall and footings to so establish his frontage line, especially as it appears the owner of the land seems to be clearing a site for a house to be erected, so that he may establish a frontage line first?"

No sanitary authority could reasonably fix a building line so far back from the road as 100ft., and you need have no fear that your client will lose his rights of building upon the large area in front of his proposed new house. No doubt your solicitors refer to the powers conferred upon the sanitary authority by section 3 of the Public Health Act, 1888 (repealing section 156 of the 1875 Act): "It shall not be lawful in any urban district, without the written consent of the urban authority, to erect or bring forward any house or building in any street, or any part of such house or building, beyond the front main wall of the house or building on either side thereof in the same street, nor to build any addition to any house or building beyond the front main wall of the house or building in either side of the same." You will notice that the exercise of the powers conferred by this section is optional on the part of the sanitary authority, and not compulsory. I do not consider it is at all necessary to take the steps you suggest, but I should certainly advise you to show the vendor's building line upon the plans you deposit for the approval of the urban district council.

F. S. I.

Smoky Chimney.

LONDON.—X.Y.Z. writes: "When the fire is lighted in the dining-room, the smoke appears in the drawing-room. What remedy can you suggest?"

You do not give an elevation of the chimney stack, but no doubt the dining-room flue is in the same stack with that of the drawing-room. The cause of the phenomenon of which you speak may be (1) that a hole has been knocked out by the chimney sweep in the "withe" dividing the flues (probably at the "gathering over" near the top); or (2) it may be caused by actual downdraught causing the smoke to enter the drawing-room flue, immediately after quitting the other flue. In the first case the remedy is obvious, and in the second a chimney-pot on one flue and not on the other may remedy the nuisance.

F. S. I.

Reckoning Height of Wall.

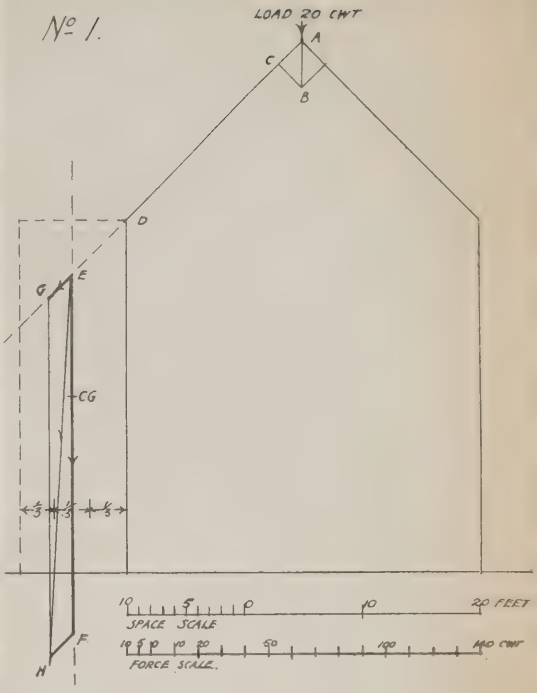
In a reply on the "Boundary Wall Problem," p. 501, in the issue of December 23rd, it is stated that the "height of such a wall is naturally reckoned from the ground line." Local authorities' building byelaws, however, generally read as follows: "The height of a wall shall be measured from the top of the footings to the highest part of the wall." This would seem to imply, from the top of the footings to the top of the coping—that is, the entire wall, exclusive of footings only, and would get over a possible difficulty where the levels of the gardens were different on the two sides of the wall.

JAS. W. GLEAVE.

R.I.B.A. Examination Questions.

LONDON, N.W.—G.B.C. writes: "The following are a few of the questions set in the construction paper, R.I.B.A. examination, November, 1908. I should be pleased if you would supply solution through your columns. Question 1.—The diagram shows two principal rafters with a single load of 20cwts. at their apex. Show graphically the thrust in each rafter, and also show how you would arrange buttresses to counteract the thrust. Question 2.—A soil-pipe is connected with a manhole, which has a cover at ground level, measuring 2ft. by 1ft. 6ins. If the outlet from the manhole be stopped and the soil-pipe be filled with water to a height of 15ft. above the ground, what will be the total pressure upon the manhole cover? Question. 3.—It is desired to overthrow a granite rectangular monolith 20ft. high by 3ft. square on plans, by means of a rope secured to its extreme top. The rope can be attached to a winch 40ft. away from the monolith and on a level with its base. What pull must the winch exert?"

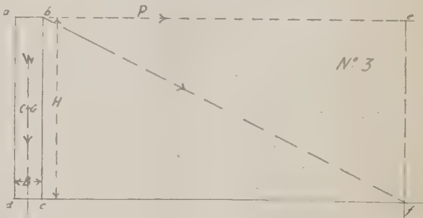
Answer 1.—Set up roof and abutments to scale, and, adopting a convenient force scale, set out A B equal to 20cwt. Draw B C parallel to pitch of roof; then A C represents thrust in each rafter to same scale. To determine graphically dimensions of buttress to resist thrust, produce direction of thrust indefinitely through D E G; assume a projection for buttress, draw perpendicular through centre of gravity of buttress assumed. From intersection of line of pressure of thrust with this assumed line of pressure of weight of buttress, set out E G equal to force of thrust, and draw E H, passing through base of buttress within middle third. From G drop perpendicular intersecting E H in H; complete the parallelogram; then E F represents weight of buttress in cwts. to same scale as other forces. Taking weight of brickwork at 112lbs. per cub. ft. we have no difficulty in arriving at remaining dimension (i.e., width) of buttress. In the diagram as drawn, this will be found absurdly narrow, as the projection has been assumed unnecessarily great in order to render the diagram compact for reproduction. The same method can, however, be applied to any case.



Answer 2.—The pressure on any surface of a closed vessel is that of a column of water with a base equal to the surface pressed, and a height equal to the head of water above the level at which pressure takes effect. In this case a column of water 15ft. high, with a base 2ft. by 1ft. 6ins., exercises a pressure equal to:—

$15 \times 2 \times 1\frac{1}{2} \times 62\frac{1}{2}$ lbs. $= 2812\frac{1}{2}$ lbs. pressure on manhole cover,

Answer 3.—When $W \times \frac{B}{2} = P \times H$ the monolith will be on the verge of movement.



$$\therefore \frac{W \times \frac{B}{2}}{H} = \text{P horizontal} =$$

cub. ft. lbs. per cub. ft.

$$\frac{180 \times 164 \times 3}{2 \times 20} = 2214 \text{ lbs. horizontal.}$$

To arrive at the diagonal equivalent (without the use of trigonometry), since the required result is represented by the hypotenuse of a right angled triangle, of which the proportions of the remaining sides, and the value of one of them are known:—

$\sqrt{2214^2 + 1107^2} = 2475.32$ lbs. inclined.

As soon as the pull exercised by the winch exceeds this, movement will commence. G.

Finishing Pitch Pine.

BANGOR.—T.A. writes: "Certain pitch-pine work is to have two coats of bright varnish and one coat of flat varnish. Will the latter get dirtier quicker than if the work were finished with bright varnish? Also, will it be less durable?"

The flat varnish would certainly retain the dirt more than the bright varnish, from the surface of which it could be wiped off. The durability of flat varnishes is by no means equal to that of ordinary gloss varnishes. Pitch-pine is not usually stained, but is given three to four coats of varnish, this number being necessary because the first coats sink in. To prevent this, two coats of sizing are often given, and then one or two coats of bright varnish will give a good job. There is a speciality on the market known as "proof priming varnish," made by Messrs. Smith and Rodgers, of Glasgow, which can be used instead of size as a first coat, and upon this a single coat of ordinary gloss varnish shows up splendidly. If desired, a coat of flat could be given over this.

J.

Responsibility for Fallen Fence.

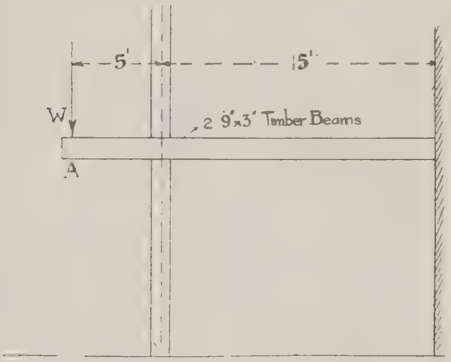
Essex.—G.B. writes: "The fence dividing the gardens at the back of two houses was blown down last March, and I have written to the adjoining landlord several times, but am unable to get him to rectify same. Can I bring any pressure on my own landlord?"

You have, of course, no claim upon the adjoining landowner (to whom, I conclude, the wall belongs), except that you have the right to remove so much of his debris as forms a trespass upon your garden, doing as little damage as possible in the removal, and not taking the materials into your own possession. As the wall is not his property, I fear you have also no claim upon your own landlord, even if you have repairing clauses in your lease calling for anv repairs upon his part to be performed. You may, however, strongly represent to him the inconvenience which you suffer, and get him to take up the matter with the neighbouring owner.

F. S. I.

Timber Cantilever.

Neasden.—"Country" writes: "What weight are the ends A of the two 9in. by 3in. timber beams, supported as shown in sketch, capable of carrying?"



If the safe load is W cwt., the maximum bending moment in inch cwt. will be $W \times 5 \times 12 = 60\ W$.

The section-modulus of each beam is $\frac{bd^2}{6} = \frac{3 \times 9 \times 9}{6} = 40.5$ inch units.

$\therefore$ Total section-modulus $= Z = 2 \times 40.5$ units $= 81$.

Taking the safe transverse stress as 10 cwt. per sq in., we have:—

Moment of resistance = stress × modulus.
$= 10 \times 81 = 810$ inch cwt.

$\therefore 60\ W = 810.$

$\therefore W = \frac{810}{60} = 13.5$ cwt.

Therefore, 13.5 cwt. is the safe load that the ends A of the beams are capable of carrying.

A.

Domestic Architecture of the Fifteenth and Sixteenth Centuries.

Rugby.—Ashby writes: "Please give the names of books dealing with architecture in the fifteenth and sixteenth centuries, as applied principally to country houses and manors."

Mr. B. T. Batsford, architectural publisher and bookseller, 94, High Holborn, kindly states that the best books he can recommend are as follows:—"Domestic Architecture of England during the Tudor Period," illustrated in a series of photographs and measured drawings of country mansions, manor houses, and smaller buildings, accompanied by historical and descriptive text, by Thomas Garner and Arthur Stratton; in three parts, price £2 2s. net per part; "Architecture of the Renaissance in England," illustrated by a series of views and details from buildings erected between the years 1560 and 1635, with historical and critical text, by J. Alfred Gotch, F.S.A., F.R.I.B.A., £7 7s. net; "Early Renaissance Architecture in England," an historical and descriptive account of the development of the Tudor Elizabethan, and Jacobean Periods, 1500-1625, by J. Alfred Gotch, 21s. net; four books (each 21s. net) on the "Old Cottages and Farmhouses" in various counties, would also shed considerable light on the subject. All these volumes can be obtained from Mr. Batsford.

Correction of Stress Diagram.

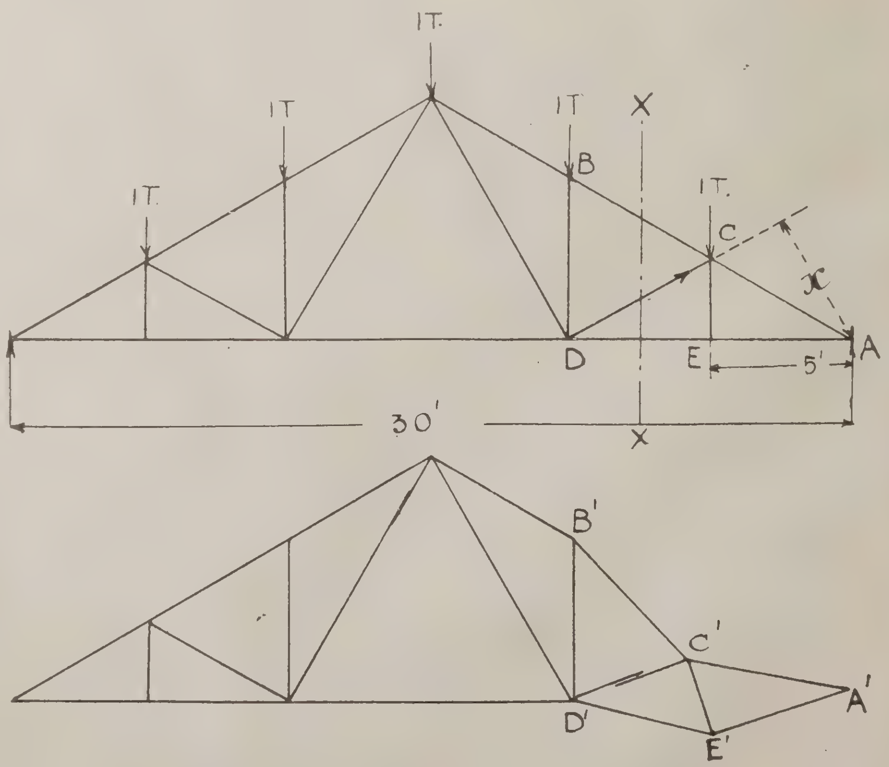
Glasgow.—T. McG. writes: "Referring to Inquiries Answered, p. 415, in your issue for November 25th, I observe an error has been made in the reply to O. J. D. The member D C is a strut under the given conditions, and not a tie, because although the cut tends to open, the effect of the member on the joints at either end of it is to push them outwards, and it is well known that when the forces in any member act 'towards' the joints, the member is in compression, and when they act 'away' from the joints the member is in tension. The truss given is mentioned as a 'somewhat usual' one, but the member C E is not usually put in, as the only stress in it is due to the portion of the weight of main tie D A, which it prevents from sagging, and in reality it is a mere suspender. The length D A is only 10ft., so that it is quite unnecessary. I think the reply on the whole is rather misleading, and would suggest the following method of finding the nature of the stress in the members. Taking D C as example. First, a section line is chosen, which cuts through this member and generally not more than two others, then the turning point A is taken at the point of intersection of the two latter members in this case B C and D E, as by this means the moments of the forces in these two members become zero, leaving only the unknown force in D C to be determined, whose normal distance from the fulcrum is known; in this case $Ax = 5$ ft. We have now only the force of 1 ton acting at C with a leverage of $\frac{30}{6} = 5$ft., and the stress in $D\ E =$ say, x, with a leverage of $Ax = 5$ ft., so that the stress in $DE = x = \frac{1 \times 5}{5} = 1$ ton. The moment of the force C is negative there, to balance this the moment of the force x must be positive, and its direction, therefore, is upwards at the upper end of member D C, showing that the member is a strut. If the moment of the force in D C had been negative, then its direction would be downwards at the upper end of the member, and, therefore, it would be a tie, or, in other words, when the direction of the force in the member considered acts towards the joint, the member is in compression, and when the direction of the force acts away from the joint, the member is in tension. Perhaps the foregoing will assist in clearing up O. J. D.'s difficulty."

There is, as two of your correspondents point out, a curious error in my reply on "Ascertaining stresses in roof trusses," in the issue named, which error I regret, and hasten to set aright. In endeavouring to explain by a very simple rule the method of distinguishing between ties and struts in the method of moments, I, by an oversight in making an incorrect drawing, stated that the bar D C is a tie, whereas it should be a strut. The present figure shows how the relative deformation should have been shown, from which it is clear that D C is a strut.

The simple method which I gave was not fallacious, but the drawing that I made somewhat too hurriedly was incorrect. If the left-hand portion be considered fixed, and the bar D C be cut through, the end A will tend to rise relatively to the rest of the truss, as the force at A is upwards, thus obtaining the relative deformation shown.

The ordinary method, which I thought would be less clear to your correspondent, is as follows: Take any section such as x x across three bars; to get this stress in one bar, say, D C, take moments round the point A where the other two bars meet. If this moment is counter-clockwise, as in the present case, the moment of the force in the bar D C will be clockwise and vice-versa. If the force in the bar acts towards the node C, as in the present case, the bar is a strut; if away, it is a tie. A printer's error in my reply has led to some comment; the reply states that the stress is "somewhat usual," whereas "somewhat unusual" was intended.

A.



ILLUSTRATING "CORRECTION OF STRESS DIAGRAM."

FIRE-RESISTING CONSTRUCTION SECTION.

(MONTHLY.)

FIRES IN 1908.

The year 1908 has afforded further evidence of the good effect of the fire protective policy that has been practised and developed during the last decade.

What with the London Building Act and other protective enactments that have been applied during that decade, and the remarkable improvement of everything relating to the organisation and management of the London Fire Brigade during the latter half of the period in question, not only is the number of fires in the Metropolis decreasing, but their character is becoming extremely mild, and it is quite an exception to meet with a really serious outbreak within the county area.

To a minor degree this also holds good in the provinces. Model by-laws, factory inspection, and insurance requirements have all gone to reduce the number of fires and the seriousness of their character, whilst there has also been a marked improvement in certain districts in the provincial fire services, especially where the fire brigades enjoy the influence of the National Fire Brigades Union.

Economically, this is a matter of congratulation for the United Kingdom; for, whilst we have been losing trade in many directions, whilst the value of property has materially decreased, and the prosperity of the country generally has suffered a set-back, there is at least one point in which the wastage in national possessions has not been so severe as it used to be, and that has been in the direction of annual fire loss. Whilst some ten years ago property to the value of some seventeen millions sterling was wasted by fire, the value of the property lost both last year and in 1907 was several millions sterling lower, and this in spite of the fact that there has naturally been an increase in the number of buildings during the decade, and thus also, in a certain sense, an increase in the number of possible fire risks.

Generally the ordinary householder has, however, scarcely felt this difference, except perhaps in the direction of his rates, which would have been higher if more money had been required for poor-law purposes to meet the demands so frequently brought upon the Guardians when a fire has turned a large number of people out of work. Only in a few directions has the householder, inasmuch as he may have been an occupier of shop or warehouse property, felt the improvement, and this in the direction of his reduced insurance rates; for a large number of the intelligent insurance officials have been, during the last few years, systematically organising non-tariff offices, seeing quite clearly that there is a very excellent profit to be made in well-organised insurance businesses which, quite rightly and fairly, take risks at a lower rate of premium than is generally charged by the so-called "tariff offices." This new competition in insurance business, combined with the lower losses and loss ratios in Great Britain, has helped to bring down some of the insurance charges, and, in fact, helped to reduce the cost of fire insurance throughout the kingdom. The cost of fire insurance in the kingdom could, however, be much less were it not for the fact that the British insurer has practically to pay for the negligence of the foreigner.

It is the fires of the United States in particular, and fires of other distant countries, that swell the insurance loss incurred by British companies; and, to put it quite plainly, it is to meet these foreign losses that the British insurance rates have to be kept at their present high level. One need only turn to the public records of any office doing British business only, or to the private records of those companies doing both British and foreign business, to see what a regrettable proportion of the British insurance premiums is absorbed in payments for fire losses outside Great Britain.

The more this becomes generally recognised, the more urgent will be the demand for new insurance companies taking the British risks only; and if these new companies would only carefully discriminate between the hazards of the different fire risks, and take special note of the important developments of late years in building construction, there is no doubt that the cost of British insurance would be materially reduced. One fact is remarkable in this direction, i.e., that none of the great fire managers of any of the older concerns has as yet had the courage to break away from the tariff association, for with the power and funds that an old company wields, and with the confidence it generally enjoys, business might well be done to a large scale on really modern lines. We think that such a development, however, is now a matter quite of the near future. One company in particular, which was noted for its amalgamation with a non-tariff office, may some day be seen as a great non-tariff institution, perhaps even as the *doyen* of a non-tariff alliance.

This insurance question is of great importance to architects and builders; for the client is daily asking why he should put in better construction into his building if he gets no substantial insurance advantage. As a matter of fact, the architect who knows his work in this direction can occasionally obtain advantages for his client; but as a general rule this is not the case, for but few architects are conversant with our insurance tariffs and conditions.

Turning now to the fire losses of the year we will again, as in previous years, refer to our contemporary the "Post Magazine," which gives its usual excellent annual record of notable fires, and on this occasion has also given some interesting facts as to the electrical fire hazards, as to the work of the Fire Prevention Committee, and the question of municipal fire insurance.

Notable Fires.

This insurance authority suggests, in effect, that the loss ratio for 1908 may be expected to be below the average as far as Great Britain is concerned.

The most serious fires of the year have been at some shoe factories in the North, of which that of Messrs. Roberts and Sons, at Leicester, was perhaps the most notable among the fires in boot factories.

The largest brewery fire appears to be that at Ipswich, which involved a loss of some £67,000.

There has been quite a large number of country-house fires, due mainly to negligence, and to the entire absence of rapid means of fire extinguishing. Notable among the fires involving losses over £10,000 was one at Scorrier, Cornwall; at Hazelwood, Herts; Monzie Castle, Perthshire (£20,000); Islay, Argyllshire; at Douglas Support, Lanarkshire (£21,000); at Normanhurst, Sussex; at Burley Hall, Rutlandshire (£44,000). These losses are of historical as well as of financial interest.

Turning to places of workship, our contemporary says that there have only been a few fires in churches.

Of theatre fires, the most notable one was that of the Drury Lane stage, which, as reported on in our Journal, involved a loss of £12,500, rather a different figure from the exaggerated ones that found their way into the daily press.

Of cotton mills there was a loss of £30,000 at Ashton-under-Lyne, and there were large fire losses at Preston, Stockport, and elsewhere.

The most notable warehouse fire occurred in London—that at the Old Bailey, involving a loss of £70,000; and one at Skipton, Yorkshire, involved a loss of £42,000.

There has been a decrease in fires in timber yards, tanneries, and the like.

There have been no great fires that have any resemblance to conflagrations in this country. In fact, the majority of fires recorded have been of quite a "one building" character, owing to the better construction of the buildings and hemming in of the area of the fire by the fire service.

If the position in Great Britain has been satisfactory, it is interesting to observe that our contemporary holds that the fire loss in the United States for 1908 is some five millions sterling above its already enormous annual average.

The fire at the City of Chelsea, near Boston, covering an area of some 275 acres, involved a loss of 2½ million sterling. A fire at New Orleans must have have cost some £300,000. A single warehouse at Kenora cost some £200,000. But it would be going too far to enter into detail. The examples cited, however, sufficiently emphasise the extraordinary loss incurred in the American Continent, and we must again express regret that so much of these losses should have to be paid for out of the pockets of the British householder.

When we consider our own Colonies, it is seen that the losses have been high, but not perhaps exceptionally so. The Australasian and the New Zealand losses, however, rank badly in the loss ratio. Christchurch, New Zealand, had a loss of half a million sterling. This is not as it should be.

Of continental fires, the most notable was that of the Paris Telephone Exchange, which was fully reported in this Journal. The loss in this one building may be estimated at one million sterling, if we take into account the enormous indirect loss involved by the building of this structure.

It is to be hoped that Great Britain will continue to lead the way in its fire protective policy, and systematically to reduce its fire loss, and that it will eventually serve as an example in this direction, not only to the Colonies, but also to some of the foreign countries.

FIRE PREVENTION IN 1908.

The British Fire Prevention Committee's Work for the Year.

The work of the British Fire Prevention Committee has been continued, if anything, more actively than in previous years, and their latest series of tests with various forms of doors and roller shutters form a very important contribution towards the technical knowledge of fire prevention.

A new departure in the committee's work during the year has been its extensive series of tests with extinguishing appliances, both proprietary and non-proprietary. The committee have dealt with the ordinary bucket and hand pump, which are both most useful for small fires, the ordinary cloth and sand for petrol fires, as also a varied assortment of patented extinguishers of different sizes, ranging from the capacity of one gallon to 125 gallons.

There is no doubt that there is a great demand at the present moment for first-aid fire-extinguishing appliances, and architects are constantly being called upon to specify them in connection with the equipment of their buildings. The work thus undertaken by the committee in this direction should also be a useful contribution to the subject, and it is to be hoped that all the various forms of appliances will eventually be examined and reported on. There is unfortunately much at present on the market in the form of fire-extinguishing powders, etc., which cannot claim the users' confidence.

The committee's work has been enjoying an even greater favour than heretofore from public authorities; and public departments, such as the Admiralty, War Office, H.M. Office of Works, are now on the committee's subscribers' list; whilst members of the Council, such as Sir Henry Tanner, I.S.O., Sir James Williamson, C.B., Mr. Riley, F.R.I.B.A., and others have been showing considerable activity in attending the Regent's Park tests, and interesting themselves in the committee's work.

The executive work of the year has been in the hands of Mr. Edwin O. Sachs and Mr. Ellis Marsland, and a very considerable amount of the testing work has been under the direction of Mr. Max Clarke, F.R.I.B.A., Mr. Percy Collins, J.P., and Mr. J. H. Dyer.

A serious loss has been sustained by the committee during the year by the death of Mr. James Sheppard, to whose work we have referred fully in our

LESSONS LEARNT

Doors.

Of lessons learnt from the committee and directly applied during the current year, we would mention, in the first place, the confidence created in roller-shutter doors. The pioneer door on the British market was the Gibson door, which has since been followed by the Wilson door, both of American origin, and now about to be manufactured in Great Britain. They will meet the new demand for larger openings in the party walls between buildings and in divisional walls.

The older forms of sliding door or hinge doors have been found to be unsatisfactory for openings over 10 ft., on account of their weight, the space they occupy, and the general cumbrous character of their gearing.

To be able to close the opening effectively, and yet be able to stow away the door overhead when the opening is in use, has been a requirement of practically every shopkeeper, and also of many manufacturers.

A weak spot of the roller-shutter door is that the door when closed is no longer easily opened for purposes of rapid exit. But this, we understand, is being overcome by placing a small door alongside, and giving it the ordinary hinged door as an exit door. The advent of the roller-shutter door means much for London buildings, and for the shopkeepers in particular, and it has been anticipated that they will soon find general adaptation, specially now that the London Building Act gives power to the Council to allow this form of door, and the Council on its part has satisfied itself, through the tests of the British Fire Prevention Committee, how very efficient this type of door can be. The permission accorded for the use of the roller-shutter door is a step towards its general introduction in the Metropolis, and it has been technically one of the features of the year, and this feature has been practically entirely due to the work of the British Fire Prevention Committee.

Fire Extinguishing Appliances.

Another lesson which, as indicated above, claims attention is that of the use of simple means for first-aid fire extinction. The committee have most clearly demonstrated the value of the ordinary household bucket, the hand pump, and the asbestos cloth, and, having regard to their comparative low cost, it is to be hoped that these every-day appliances will find greater application than heretofore, in both domestic and public buildings.

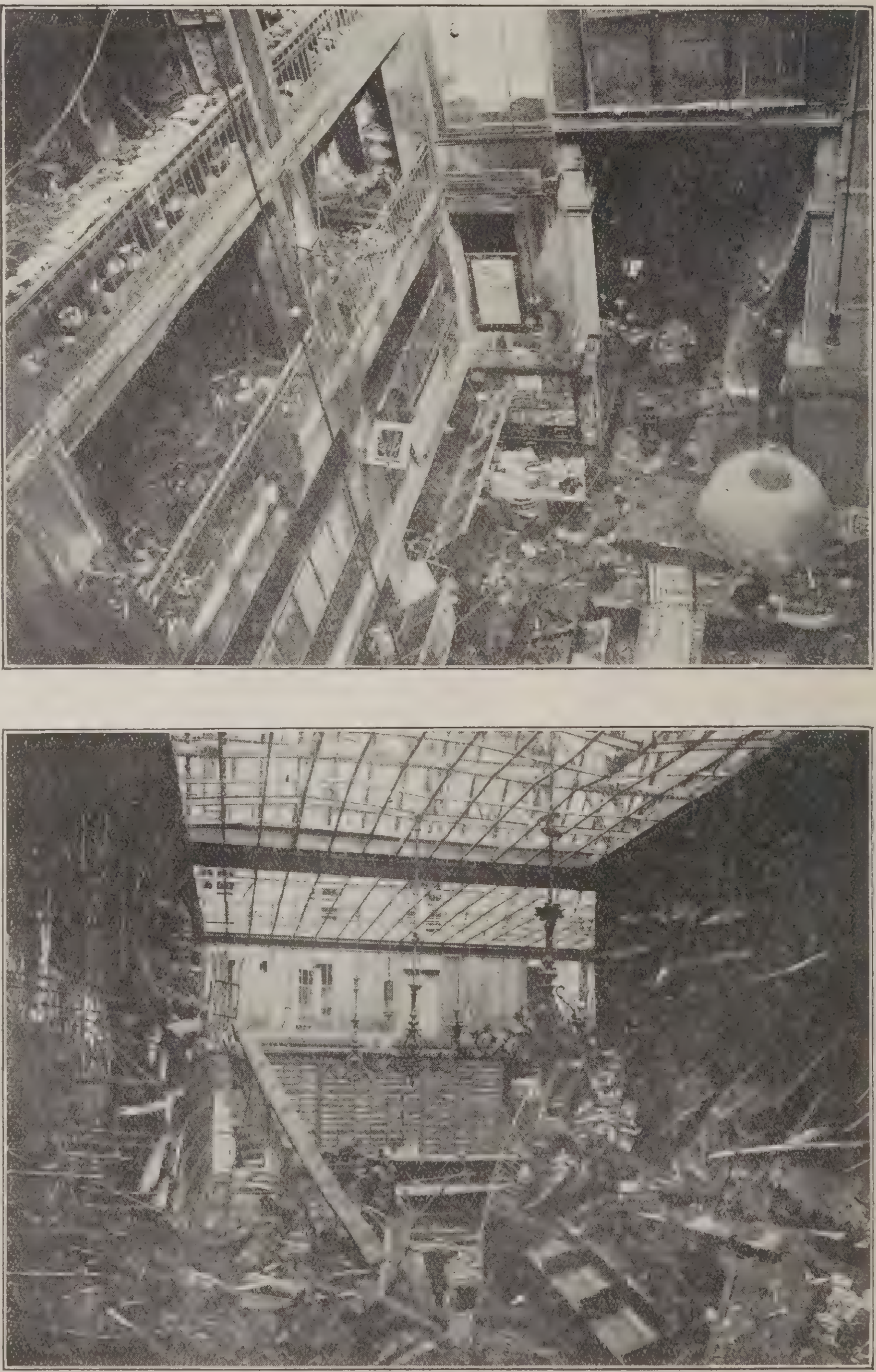
It is not always essential to spend large sums on chemical extinguishers or the like. Anyone comparing the reports of the British Fire Prevention Committee will soon realise how much efficiency can be obtained from first-aid appliances, and that the more expensive appliance does not necessarily mean the more efficient one; in fact, quite the reverse.

It is public property that at recent tests a few buckets of water have been shown to do in the extinction of ordinary small fires what a number of powder extinguishers failed to do. As a bucket costs about 2s. 6d., and the powder extinguishers are listed at 10s. each, the ratio of cost is not very encouraging to manufacturers of "powder"-appliances.

Future Work of the Committee.

We understand that the committee is now occupied with the important work of assembling the data obtained at its tests, with a view to issuing them in tabular form, and should this work be accomplished during the coming year, another step in the right direction will have been taken by the committee.

Speaking of the membership and subscription list of the committee, it is pleasing to observe that not only are our own Government Departments taking an interest in its work, but those of our distant Colonies are also now co-operating with the committee. Further colonial sections of members are being formed, the first of which is in New Zealand, which boasts of some 25 members. It would indeed be valuable if the committee became not merely British in the ordinary sense, but Imperial, in its influence.



ST. DENIS DRAPERY STORE FIRE, PARIS. GENERAL VIEW OF CENTRAL COVERED COURTS.

Of tests advised for the coming year, we understand there will be some further series of door and shutter tests, and also with reinforced concrete floors.

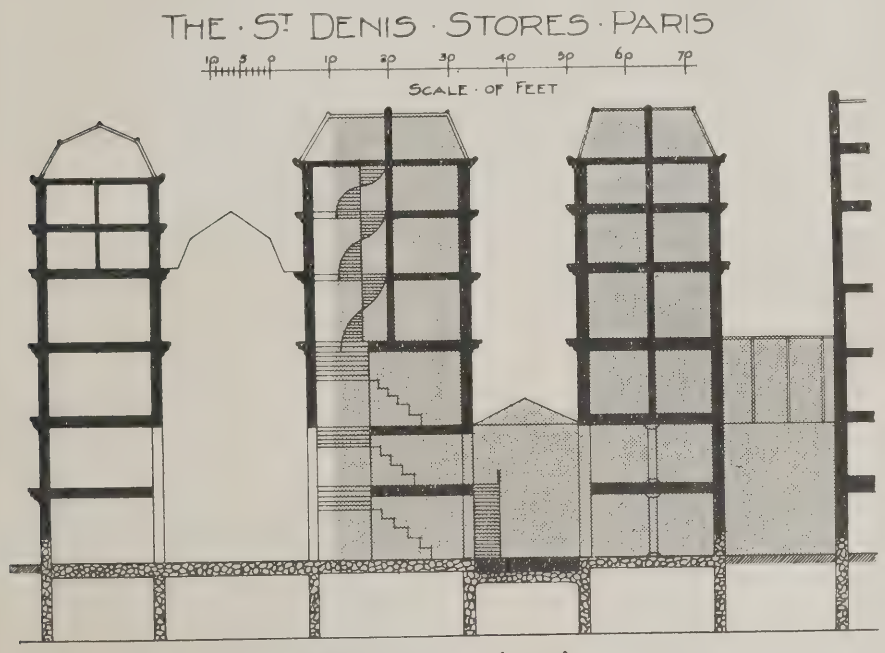
A NOTABLE FIRE AT A PARIS DRAPERY STORE.

It may be remembered that some little time back we published very full particulars of the fire at the Paris Telephone Exchange, which besides being a notable fire, curiously occurred on the same day as the fire at one of the great drapery stores for which Paris is noted.

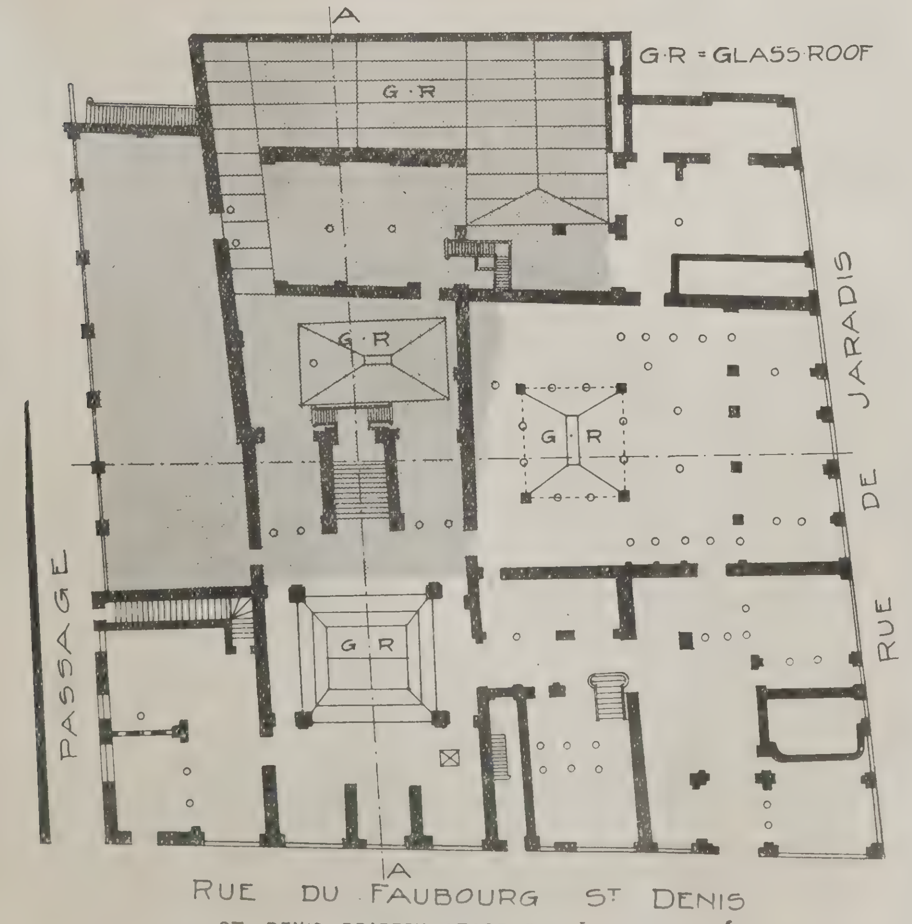
We are now presenting some photographs of this fire, which occurred at the St. Denis Stores, and we are also showing some plans and sections that will give some idea of the cubic extent involved. The chief reason for presenting these illustrations is found in their value as an object lesson in the necessity of not being too lax in the matter of cubic extent.

It may be remembered that the year 1908 is noted in the annals of building legislation for the passing of the amendments to the London Building Act that at length allow the metropolis to have buildings of greater cubic extent than heretofore, subject to the supervision of the London County Council, and particularly to its Superintending Architect and the Chief Officer of its Fire Brigade.

There can be no doubt that it is unwise to let any one compartment of a building be of an extraordinary cubic extent, and that it is of the utmost importance for the door openings leading from one compartment to the other to be protected by the very best steel roller shutter doors, which can be brought into operation promptly when required, and can be stowed away without interfering too much with the general conduct of the business in the buildings concerned. It is as an object lesson in this direction the illustrations are given.



SECTION A-A



ST. DENIS DRAPERY STORE FIRE. PARIS.
PLAN AND SECTION SHOWING PORTIONS AFFECTED BY THE FIRE.

CONCRETE AGGREGATES AND FIRE RESISTANCE.

An important interim report has been issued by the British Fire Prevention Committee, which may be looked at as a preliminary step towards standardising the question of concrete aggregates generally, but more particularly in respect to their fire resistance.

The Special Commission appointed by the Committee some time back, under the chairmanship of Sir William Preece, K.C.B., had the following reference to deal with:—

> "That having regard to the confusion existing as to concrete aggregates, and the absence of their exact specification, the British Fire Prevention Committee do hereby constitute from among its members and subscribers a Special Commission to report upon and define the aggregates suitable for concrete floors intended to be fire-resisting, having due regard to questions of strength, expansion, and the chemical constituents and changes of the aggregates."

The Commission that was entrusted with the consideration of this question had Mr. Edwin O. Sachs, F.R.S.Ed., as deputy-chairman; Mr. W. T. Hatch, M.Inst.C.E., and Mr. Max Clarke, F.R.I.B.A., as sectional chairmen of the sub-committees, entrusted with certain departments of the enquiry, whilst the membership included representatives from the Admiralty, such as Mr. C. H. Colson, M.Inst.C.E.; from the War Office, such as Col. A. H. Bagnold, R.E.; and such authorities as Mr. A. Ross, M.Inst.C.E. (Chief Engineer of the Great Northern Railway), Mr. W. H. Hunter (Chief Engineer of the Manchester Ship Canal), Mr. E. G. Rivers, M.Inst.C.E. (Chief Engineer H.M. Office of Works), Lieut.-Col. Winn, R.E., Mr. Restler, M.Inst.C.E. (of the Metropolitan Water Board), Mr. Frank Sumner (Chief Engineer to the City of London), and others, Mr. Matt. Garbutt, F.R.I.B.A., A.M.Inst.C.E., acting as honorary secretary to the Commission.

The report that has now appeared is precisely what it is intended to be, i.e., an interim report, and it tells us, in short, that nothing can really be done without a considerable amount of research work and test, that the reference to the Special Commission should be extended to cover concrete generally, and that funds and facilities must be found promptly to carry out the necessary investigations.

These necessary investigations, with the materials used for aggregates, comprise:—

1. Crushing tests;
2. Fire tests;
3. Tests as to the holding power of rods in concrete;
4. Deterioration tests;
5. Expansion tests, and certain chemical tests and analyses.

As to the precise materials for aggregates that the Commission holds should be under investigation, the following is the official list:—

ARTIFICIAL.

1. Coke breeze;
2. Clinker;
3. Blast furnace slag;
4. Broken brick;
5. (a) Gault clay burnt;
   (b) Ordinary burnt clay ballast;
   (c) Broken terra-cotta;
      (1) Porous;
      (2) Dense.

NATURAL.

6. Natural ballast (gravel);
7. Volcanic rocks;
   - (a) Basalts, traps, dense lavas, etc.;
   - (b) Lavas and rocks of similar character;
   - (c) Pumice, etc.
8. Crushed granite;
9. Sandstones, limestones, quartzites, and rocks of a similar character.

Continuing, the report indicates that, seeing there are at least fifteen materials to deal with, and that the tests, to be in any way reliable, will have to be conducted over a period of three years, the amount of work that is necessary is very considerable.

A programme of tests has been prepared by the Special Commission, and we see it indicated, for instance, that no less than 750 blocks of concrete are required for the crushing tests, 288 cylinders for the deterioration tests, 216 blocks for expansion tests, etc., and also 45 large slabs for the fire tests.

What, however, is of very great interest at the moment in connection with this interim report is a Schedule (A) attached thereto giving a clear specification for the various materials generally used for aggregates in this country, or, in other words, giving the professional man something authoritative to refer to when specifying aggregates, very much in the form of what might be termed a standard specification, and what may eventually be recognised as such. There are, of course, certain blanks still in the specification which will have to be filled in after due research, but even as it stands it is a most valuable guide, and should be of great value to all concerned.

The British Fire Prevention Committee is certainly to be congratulated on issuing the specification, even at this intermediate stage, instead of doing what so many societies do, locking away their work until all research and all queries have been settled up. The specification is not complete or final as it stands, but it serves immediate purposes.

Having regard to the importance of the question, we are printing the list of aggregates below:—

PROVISIONAL SPECIFICATIONS FOR CONCRETE AGGREGATES ISSUED BY THE SPECIAL COMMISSION ON CONCRETE AGGREGATES.

Artificial Materials for Aggregates.

1. COKE BREEZE.

Coke breeze for use as a concrete aggregate shall be entirely coke taken from the gas retort, coke oven, or special furnace. It shall be absolutely free from clinker, coal, and all substances that will not float in water, and from any admixture of material taken from the retort furnace or water-pan below it, and from cinder, ash, or other admixture. The proportion of sulphur in coke breeze shall not be more than.................per cent.

NOTE.—It was decided that the determination of the allowable amount of sulphur should be the subject of future consideration.

2. CLINKER.

Clinker for use as a concrete aggregate shall be the thoroughly burnt and hard waste product of furnaces, free from dust, shale, or free lime, and not having more than....................per cent. of sulphur.

NOTE.—Pan breeze is included in this definition.

NOTE.—In this case, as in that of coke breeze, it was decided that the determination of the allowable amount of sulphur should be the subject of further consideration.

3 BLAST FURNACE SLAG.

Blast furnace slag for use as a concrete aggregate to be obtained and selected from pig iron smelting furnaces (to the exclusion of basic slag), to be of porous quality, to be washed to remove dust and sulphur, to be without free lime, and not to contain more than...............per cent. of sulphur.

NOTE.—In this case also, it was decided that the allowable amount of sulphur should be the subject of further consideration.

4. BROKEN BRICK.

Broken brick for use as a concrete aggregate shall be from well-burnt and perfectly sound and hard clay bricks, such as London stock bricks, or bricks of equal quality, and shall be of the size specified and be free from old mortar, and from dust or particles that will pass through a sieve of ⅛-in. mesh.

5. (a) GAULT CLAY BURNT.

Burnt gault clay for use as a concrete aggregate shall be free from free lime and sulphur and from unburnt particles, and shall be thoroughly hard, so that pieces soaked in water for...........hours shall not disintegrate.

NOTE.—It was decided that the Tests Sub-Committee should be asked to determine the length of time to be inserted in the clause.

5. (b) ORDINARY BURNT CLAY BALLAST.

Ordinary burnt clay ballast for use as a concrete aggregate shall be free from free lime and sulphur and from unburnt particles, and shall be thoroughly hard, so that pieces soaked in water for.........hours shall not disintegrate.

NOTE.—It was decided that the Tests Sub-Committee should be asked to determine the length of time to be inserted in the clause.

5. (c) BROKEN TERRA-COTTA.

(1) *Porous.*—Broken porous terra-cotta for use as a concrete aggregate shall be (a) from clean and well-burnt earthenware, unglazed, which has been mixed before firing with some combustible material such as sawdust, so that after firing it is of a porous or cellular texture or (b) from clean and well-burnt unglazed earthenware which is capable of absorbing at least.................per cent. of its own weight of water.

(2) *Dense.*—Broken dense terra-cotta for use as a concrete aggregate shall be from clean and well-burnt earthen or stoneware, unglazed, and shall be incapable of absorbing more than.................per cent. of its own weight of water.

NOTE.—It was decided that the Tests Sub-Committee should be asked to determine the percentages to be inserted in these clauses.

Natural Material for Aggregates.

6. NATURAL BALLAST (GRAVEL).

Natural ballast for use as a concrete aggregate shall be gravel from river beds, sea coasts or glacial deposits, washed, if necessary, to remove dirt, loam, earthy or saline matter, clay, and other foreign substances.

7. VOLCANIC ROCKS.

All rock of volcanic origin for use as a concrete aggregate shall be entirely free from decomposed parts, and must show no signs of expansion, disintegration, or dissolution after having been immersed in water for 72 hours.

Rocks of this nature may be divided into the following classes:—

(a) Basalts, traps, dense lavas, etc., weighing not less than..............lbs per cubic foot. These shall be dense, thoroughly vitrified, not scoriaceous, show a clean fracture when broken, be homogeneous and free from marked cellular structure.

(b) Lavas and rocks of similar character, weighing not less than.......... lbs. per cubic foot. These shall be hard and free from all soft or organic matter, but they will not be so hard, and will be more cellular than those of section (a).

(c) Pumice weighing not more than ....lbs. per cubic foot. It shall be hard, free from all organic matter, soft dust or impurity, and show a bright silky structure when broken.

NOTE.—It was decided that the Tests Sub-Committee should be asked to determine the weights to be inserted in these clauses.

8. GRANITE.

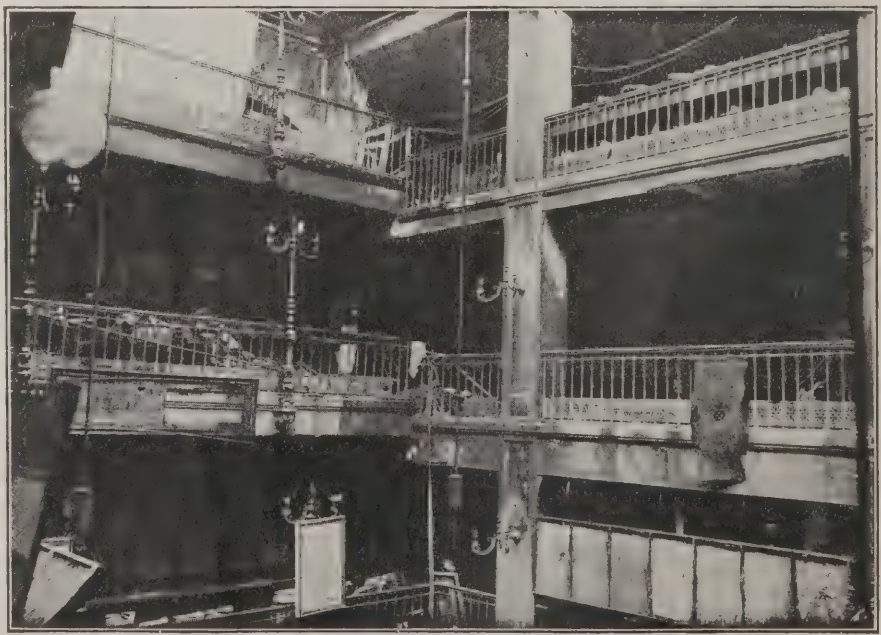
Granite for use as a concrete aggregate shall be obtained from..............(*here insert name of quarry*), and shall be reduced to the specified dimensions by crushing or breaking, and shall be close, hard, and of even texture; free from large crystals of felspar, dirt, argillaceous or organic materials, all decomposed particles, and from dust that will pass through a 1-16th inch mesh.

9. SANDSTONES, LIMESTONES, QUARTZITES, AND ROCKS OF SIMILAR CHARACTER.

Rocks of these characters for use as concrete aggregates shall be dense, uniform, and homogeneous in structure and composition. They shall have small, even grains and crystalline texture.* Frac-

---

*This is not intended to exclude Oolites otherwise suitable.



VIEW SHOWING CONSTRUCTION OF GALLERIES.
THE ST. DENIS DRAPERY STORE FIRE, PARIS.

tures shall be clean and free from large flaws. The weight of the material shall not be less than 130 lbs. per cubic foot, nor its crushing strength less than 200 tons per square foot, and it shall not absorb more water than 8 per cent. of its weight after immersion for 24 hours. The aggregate after preparation shall be free from all dirt, decomposed rock, argillaceous and organic material.

FIRE PROTECTION ON THE UNDERGROUND RAILWAYS.

We have frequently pointed out the danger of fire on our underground railways, particularly on the older ones, where a policy of false economy prevented the owners from doing what we consider their duty to the travelling public by reconstructing their railway stations on a fire-resisting system, and constructing their rolling stock of fire-resisting or non-inflammable materials.

Fires are occurring from time to time on the underground railways and tubes, and although these accidents are belittled, the danger is generally grave; and should they occur at an unfortunate moment, the result would certainly entail the most serious consequences.

We thus welcome the attitude of the London County Council in respect to this matter; and although their programme will impose additional work and responsibility upon the London Fire Brigade and its able officers, we hold that the new procedure is warranted by the better safeguards that the public will enjoy.

What, however, would be far more satisfactory would be a short Act of Parliament (of a retrospective character) making it compulsory for the underground railways and tubes to banish the whole of the inflammable material on the railway stations and rolling stock, within a certain given period, say within the next ten years. It is to be hoped that something will be done in this direction.

Report of the L.C.C.

"On 28-29th July, 1908, we stated that we had had before us a report by the chief officer of the Fire Brigade on the fire which occurred on 16th July, 1908, on the City and South London Railway, and that the report raised several questions of importance upon which representations should be made to the Board of Trade; and the Council authorised us to make, during the summer recess, any representations to the Board which we might consider necessary and urgent for the purpose of further reducing the danger from fire on the City and South London Railway and tube railways generally, subject to our reporting any action taken under such authority. We are now in a position to indicate the suggestions which, in our opinion, should be made to the Board.

"Dealing first with tube railways constructed since 1904, and built in accordance with the regulations laid down by the Board of Trade in that year, and with regard to which the chief officer has certified that efficient hydrants, hose, and fire appliances have been provided, we have two main suggestions to make. The first is that the fire appliances in question should be periodically inspected by the chief officer, with a view to seeing that they are efficiently maintained. This inspection is, in our opinion, essential, and it is desirable that in making this inspection the chief officer should deal with any points which may occur to him affecting the general question of protection from fire. He has already drawn our attention to some matters to which the Board's notice should undoubtedly be called. It is not anticipated that this work of inspection will involve additional expenditure. We further propose that, in order to save time, the chief officer should be authorised to communicate direct to the Board of Trade any suggestions which he may desire to make, reporting subsequently to us the action taken in each case. The other suggestion is that automatic signal lights, or preferably an illuminated sign, should be provided which would show on the platforms of the stations concerned, and also on the street level, when the current to the live rail is cut off in either direction. It is obviously very important that firemen and other persons working in the tunnel of a tube railway, as on the occasion of the fire on the City and South London Railway on 16th July, 1908, should have reliable information as to whether the current is on or not.

"As regards tube railways constructed before 1904, it is undoubtedly desirable from the point of view of public safety that they should be made to comply with the regulations of 1904 with as little delay as possible, although we realise that it may not be practicable to insist upon immediate compliance with the regulations in their entirety. We propose that the Board should be asked to consider this point, and, in the event of the Board not being prepared to insist upon all the regulations of 1904 being carried out, we suggest that the owners of such railways should at least be asked to carry out certain important provisions which we indicate below. These lines should of course be periodically inspected in the same manner as we proposed with regard to lines constructed since 1904. In the case of the City and South London Railway, we are informed that the company are carrying out certain works with a view of reducing the danger from fire on the railway, and that they are arranging to carry out further works, and to take other precautions which, while not bringing the line entirely up to the standard laid down in the Board of Trade regulations of 1904, go some considerable distance in that direction.

"Appended to the minimum requirements as regards fire-appliances made by the Board of Trade in 1904, at the Council's suggestions, was an observation to the effect that it should be borne in mind that in the event of a fire obtaining any hold in a tube railway the fire brigade would be practically of no avail, and that the railway authorities must therefore rely upon their own resources. In view, however, of the work the brigade were able to do at the fire on the City and South London Railway referred to above, we suggest that this observation should be altered so as to read that in the event of a fire on a tube railway not being readily extinguished by the railway employees, immediate notice should be given to the fire brigade by telephone and by the nearest fire-alarm. We recommend:—

"(a) That, in the opinion of the Council:

(i.) The fire-appliances on all tube railways, whether constructed before or since 1904, should be periodically inspected by the chief officer of the fire brigade with a view to seeing that they are efficiently maintained; and, in making such inspection, the chief officer should deal with any points which may occur to him affecting the general question of protection from fire, and should communicate direct to the Board of Trade any suggestions which he may desire to make.

"(ii.) There should be provided, on all tube railways, whether constructed before or since 1904, automatic signal lights, or preferably an illuminated sign, which would show on the platforms of the stations concerned, and also on the street level when the current to the live rail is cut off in either direction.

"(iii.) The owners of all tube railways constructed before 1904 should be called upon to comply, with as little delay as possible, with the requirements made in that year, or, if this is considered impracticable, such railways should at least be provided with—(a) fire-appliances as far as possible in conformity with the minimum requirements made in 1904; (b) a hydrant, with sufficient hose, fitted 100 yards down each tunnel from each end of each platform; and (c) an incombustible platform between and at the sides of the rails for persons to walk upon.

"(iv.) The minimum requirements, etc., as regards fire-appliances made in November, 1904, should be varied by the omission of the observation (d) as to the fire brigade being of practically no avail in the event of a fire obtaining a hold in a tube railway, and the substitution therefor of the following observation:—'In the event of a fire in a tube railway not being readily extinguished by the railway employees, notification should be immediately given to the fire brigade by telephone and by the nearest fire-alarm.'

"(b) That the foregoing resolution (a) be communicated to the Board of Trade."

RECENT OFFICIAL FIRE TESTS OF THE B.F.P.C.

Simple Means of Fire Extinction.[1]

In an age when everything is being patented, and when so many articles rank as proprietary, it is interesting to consider what we may term the simple applied means of fire-extinction, available to the man in the street and purchasable practically all over the country. We have previously mentioned that the British Fire Prevention Committee was undertaking a series of tests with buckets and hand-pumps, with a view of obtaining some data as to their relative efficiency as compared with the newer extinguishers now favoured in several directions. We also reported that, a great difficulty having been experienced in distinguishing petrol fires, even with the best of proprietary articles, the committee had undertaken a series of tests showing the efficiency of ordinary asbestos cloths, sand, and steam when petrol fires occur.

Two reports, dealing respectively with the bucket and hand-pumps, and with the asbestos cloths, sand, and steam as a means of fire-extinguishing, are now before us; and, having regard to the fact that architects and surveyors are frequently called upon to specify the fire-extinguishing equipment of buildings, both public and commercial, and to bring about improvements in our country houses, the reports (Nos. 128 and 133) may serve as a useful guide as to what can be obtained in the way of extinguishing gear at a very small output.

Buckets of Water, Hand-pumps, etc.

As to the tests with buckets of water, hand-pumps, etc., the preamble, which is signed by Mr. Edwin O. Sachs, F.R.S.Ed., chairman of the committee, is perhaps best indicative of what the tests were intended to teach. His note to report No. 128 runs as follows:—

> The tests here recorded were undertaken with a view of arriving at data which, if compared with those obtained in identical or similar tests in which hand chemical fire extinguishers are used, would allow of the relative value of the various types of first aid appliances being more properly realised than is generally the case.
>
> The chemical fire extinguisher (containing 2 to 3 gallons of liquid), if so constructed that it

can be readily and easily handled by parties not conversant with its action or peculiarities, has considerable advantages, assuming of course that it is in a proper workable and clean condition.

But it should not be forgotten that the ordinary bucket of water and hand-pump have a very high fire-extinguishing efficiency.

Thus, the advent of the hand chemical fire extinguisher should by no means imply neglect of the humbler and simpler extinguishing appliances.

We will not go into the detail of the report, but will present the summary, which reads as follows:—

Summary of Tests.

The following is a summary of the results of the tests by the Committee:—

The tests demonstrated that a small quantity of plain water energetically applied from vessels in common use, such as buckets and simple hand-pumps, is almost uniformly effective in extinguishing promptly small fires in their early stages, except in respect to burning spirit, such as petrol.

The efficiency of plain water so applied does not depend upon exceptional skill or dexterity in handling the vessels or appliances, but, given fair aim, is mainly effected by the amount of energy accorded to the operation of throwing or pumping respectively.

The following table summarises the number of buckets, etc., used, the time occupied in their application, the distance at which they were operated, and the effect noted:—

Test or Re-test.	Number Bucket, etc.	Time Occupied. min.	secs.	Remarks.
No. 1	2 tumblers, 1 jug, 1 pitcher, and 1 bucket of water, with a few splashes of second bucket.	0	50	Fire out in 50 secs.
1A	2 tumblers, 1 jug, 1 pitcher, and ½ bucket of water.	0	30	Fire out in 30 secs.
2	4 buckets, 1 hand pump, another bucket, then a bucket full in hand pump.	3	4	Fire checked, but smouldering continued.
3	2 buckets and 2 splashes out of a third.	0	20	Fire out in 20 secs.
4	8 buckets and 1 hand pump.	3	35	Fire out in 3 mins. 35 secs.
5	A little more than ½ hand pump.	2	1	Fire out in 2 mins. 1 sec.
6	1½ buckets.	0	22	Fire out in 22 secs.
7	3 buckets.	0	12	Fire out in 12 secs.
7A	¼ bucket of water from hand pump.	0	12	Fire out in 12 secs.
8	1 bucket, ½ hand pump	0	58	Fire out in 58 secs.
9	Half the contents of 1 hand pump, with the addition of 1 bucket played continuously.	1	0	Fire out, petrol all consumed.
9A	The contents of 1 hand pump and 5 buckets played continuously.	4	5	Fire out, petrol nearly all consumed.
10	—	not carr	ied out	
11	3 buckets.	3	5	Fire nearly out in 45 secs.; fire out in 3 mins. 5 secs.
12	4 buckets.	0	37	Fire out in 37 secs.

Note.—Each bucket contained about 14 pints of plain water on the average (buckets of 13 and 15 pints capacity were used), each pitcher 10 pints, each jug one quart, each tumbler ½ pint, hand pump 5 gallons.

Note.—No. 10 test omitted by order of the Committee.

We will only mention that amongst the small objects used, were tumblers, jugs, pitchers, buckets of water, and the every-day hand-pump, i.e., all the appliances that should be available in a well-managed establishment.

We also present an illustration showing the actual gear used, as it may be useful for specification purposes.

Regarding the description of the buckets and hand-pumps, the report gives the prices at which they are purchasable, also the range of efficiency. These details read as follows:—

Description of Buckets, Hand Pumps, etc.

Galvanised iron buckets, bought in the open market, were used. The two patterns used, with their dimensions, are shown in the illustration. The buckets, which contained 13 pints (7.353 l.) of water when filled to within 2 in. (051 m.) of the rim, cost 2s. 3d., and the buckets which contained 15 pints (8.519 l.), when similarly filled, cost 2s. 8d.

The hand pump was of the ordinary type, fitted in a large bucket, as shown in the illustration, purchaseable in the open market, at from £2 10s. to £4, according to quality and finish, and contained 5 gals. (22.717 l.) when filled to within 2 ins. of the top. The hose was of leather, copper riveted, and the nozzle had a diameter of 3-16 in. (4.762 mm.).

The pitcher was an ordinary earthenware bedroom pitcher of 10 pints (5.679 l.) capacity when filled to within 2 ins. (.051 m.) of the rim; the jug was an ordinary earthenware kitchen quart jug (1.136 l.), and the glass an ordinary ½ pint (.284 l.) kitchen tumbler.

Range of Buckets, Hand Pumps, etc.

The range, when handled by an able bodied man, selected ad hoc, and using the appliances without previous trial, was as follows:—

Hand pump 45 ft. (14.020 m.) at 10 secs.; 40 ft. (12.192 m.) at 30 secs., and 40 ft. (12.192 m.) at 60 secs., the appliance being exhausted in 1 min. 27 secs. (one man, one application).

The contents of the 13 pint buckets thrown 28 ft. (8.534 m.), (average of six throws by two men, three throws each).

The contents of the 15 pint buckets thrown 27 ft. 6 ins. (8.382 m.) (average of six throws by two men, three throws each).

The tests were the usual standard tests which the committee require for the small extinguishers of two or three gallons' contents, and comprised what might be termed the usual staple test, petrol test, heap-of-straw test, burning celluloid test, oily rag test, crate test, packing-case test, and the like.

As to the general arrangements, the directing member for these tests was Mr. Percy Collins, J.P., and among his sub-committee were Mr. Ellis Marsland (district surveyor) and two Fire Brigade officers, Mr. J. Herbert Dyer and Mr. R. W. Henderson, both vice-presidents of the National Fire Brigades Union. Sir J. Williamson, C.B., represented the Council, and Mr. Edwin O. Sachs represented the executive of the British Fire Prevention Committee.

Asbestos Cloths.

The test with asbestos cloths, sand, and steam was applied to burning petrol, and has been accorded very general public attention, no doubt having regard to the increasing number of petrol fires since the advent of motor traction.

The tests were of an extremely dangerous character, requiring considerable police and medical arrangements, and a very strong sub-committee.

The sub-committee had as its directing member again Mr. Percy Collins, and amongst those acting on it were Mr. J. Herbert Dyer and Mr. Henderson, referred to above; Mr. Horace Folker, the late hon. secretary to the Fire Brigades Union; Mr. Fulkes, insurance surveyor; and others conversant with the subject. Sir James Williamson and Mr. Edwin O. Sachs again did duty for the council and the executive, and among the very large attendance of members and visitors were included a number of eminent Government officials.

Here the tests were undertaken at the instigation of the Association of London Dyers and Cleaners, who have constantly to guard against fire hazards of a very serious kind.

The object of the tests is given as follows:

To ascertain the effect of the application of asbestos cloths, sand and steam upon petrol and various burning materials, but principally upon burning petrol, and more particularly under conditions which would be met in processes employed on the premises of dyers and cleaners.

The following is a summary of the results of the tests by the Committee:—

The tests demonstrated the complete efficiency of asbestos cloths in putting out burning spirit vapour.

In the case of burning materials it was demonstrated that asbestos cloths could be of use in confining the fire until other appliances were brought into play.

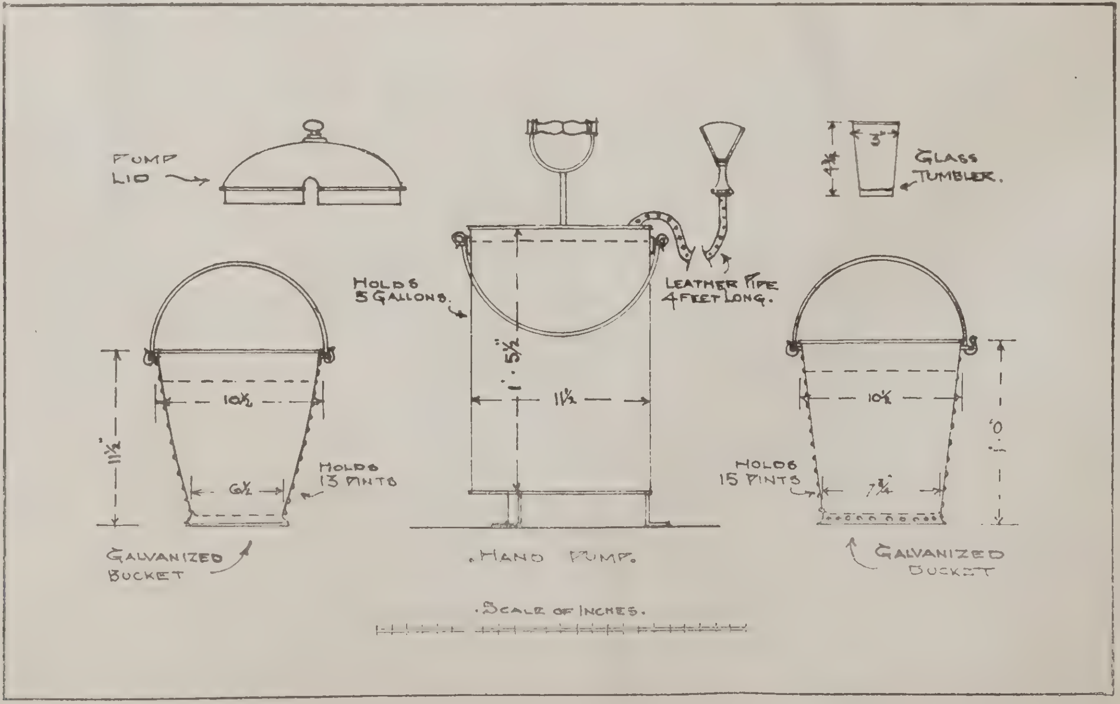
Note.—The efficiency of sand was demonstrated where it can be employed to soak up spirit, the vapour of which is ignited.

The efficiency of steam, as applied, was demonstrated where a building in which the fire is burning can be closed up, so as to exclude as much draught as possible.

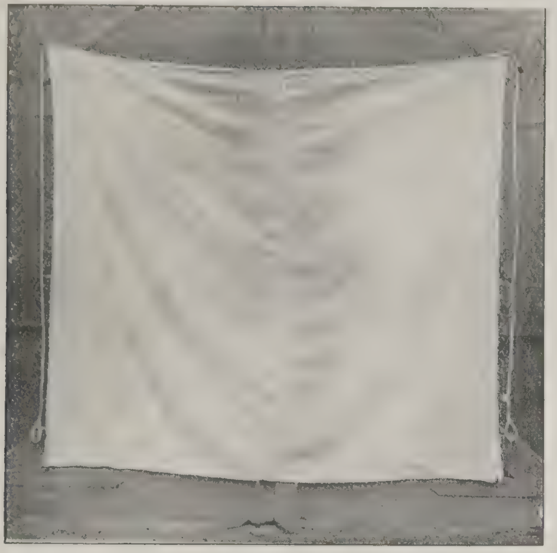
As to the lesson of the tests, Mr. Percy Collins writes in his preamble as follows:—

The application of the asbestos cloths was certainly effective, and fully demonstrated their great utility in subduing fires caused by spirit vapour. They showed that where trade processes need the employment of a volatile spirit, these asbestos cloths form a most valuable first-aid appliance.

As to the use of sand (which was applied in one case), its value was also shown, but further tests should be carried out.



THE HAND PUMP AND THE ORDINARY BUCKETS, ETC., USED.



AN ASBESTOS CLOTH WITH CORDS.
(*On right hand side*) A DYER'S VAT.
RECENT BRITISH FIRE PREVENTION TESTS.

With respect to the employment of steam—the effect of this was most marked. While there was plenty of ventilation in the upper part of the walls of the hut to correspond with what would be arranged for in buildings occupied for processes of manufacture requiring the use of volatile spirit, the steam, nevertheless, quickly diffused throughout the hut and quenched the fire. It is, however, important that the amount of steam available should bear a suitable relation to the cubic contents of the room or rooms to be protected.

The tests were certainly most instructive, and were taken by the committee, with what may be termed the minor fire appliances.

The reports are, as usual, very well printed and produced.

THE CONCRETE INSTITUTE.

At a meeting of the Council of the Concrete Institute, held on Thursday evening last, at which Sir Henry Tanner, I.S.O., presided, and at which there were present, among others, Sir William Preece, K.C.B., Mr. Edwin O. Sachs, F.R.S.Ed., Mr. A. Ross, M.Inst.C.E., Mr. William Dunn, F.R.I.B.A., Mr. A. F. Collins, M.Inst.C.E., Mr. Marsh, M.Inst.C.E., Mr. B. Hannon, B.A., Mr. L. Serraillier, and Mr. Frank May, J.P., it was decided that all new members resident in Great Britain, joining after the enrolment of the first five hundred members, should be subject to an annual subscription of two guineas, instead of the present subscription of one guinea, which latter subscription will, however, still be retained for new colonial and foreign members. The membership of the Institute already exceeds 400.

A number of appointments to the standing committees of the Instiute have now been held. The committees on science, on Parliamentary matters, on mass concrete, and on tests, have respectively as chairmen: — Mr. William Dunn, F.R.I.B.A., Mr. A. Ross, M.Inst.C.E., Mr. C. H. Colson, M.Inst.C.E., and Mr. W. T. Hatch, M.Inst.C.E., and the following are acting as honorary secretaries to various standing committees:—Mr. F. E. Wentworth-Shields, M.Inst.C.E. (science), Mr. J. E. Franch, A.R.I.B.A. (Parliamentary), Mr G. Kirkaldy, Assoc.Inst.C.E. (tests), and Mr. R. W. Vawdrey, B.A. (reinforced concrete practice).

The third general meeting of the Institute will take place at the Royal United Service Institute, Whitehall, on the evening of February 18th, when Mr. Serraillier will read a paper on certain aspects of reinforced concrete.

A cast of the Bacon statue, which is to be sculptured by Mr. F. W. Pomeroy, A.R.A., has just been erected on a wooden pedestal in the centre of South Court, Gray's Inn.

Works in Progress and Completed.

BEDMINSTER.—A new Council School in Parson Street was opened on the 12th inst. The new buildings, in two blocks, provide accommodation for 500 senior scholars and 530 junior scholars. The cost has amounted to £20,000. Mr. H. Williams was the architect, Messrs. E. Walters and Son the general contractors, while the plumbing and sanitary work was executed, under a direct separate contract, by Messrs. John Wilkins and Sons.

BEXHILL-ON-SEA.—The new Church of St. Barnabas is rapidly approaching completion, and is expected to be finished by April. The work comprises the completion of the original design by the late Sir Arthur Blomfield. Messrs. Dove Brothers, Ltd., of Islington, London, are the contractors.

BRIDLINGTON.—The Bridlington education authority has accepted the following tenders for the erection of new public elementary schools at Bridlington:—Building: Mr. A. A. Booth, contractor, Bridlington, £8,547. Heating: Messrs. Dinning and Cooke, Newcastle-on-Tyne, £272. Furnishing: Messrs. Illingworth, Ingham, and Co., Leeds, £576.

BROMLEY, KENT.—The Lyric Theatre here is being altered and improved, at an estimated cost of £700. Mr. Frank T. Verity, F.R.I.B.A., London, is the architect.

EDINBURGH.—The new science rooms at the University were opened by Mr. Haldane, the Secretary of State for War, on the 12th inst. The buildings, which we have previously described, were designed by Messrs. MacGibbon and Ross.

FLINT.—New Council Schools have been opened here. Mr. Samuel Evans, County Surveyor, was the architect, and the cost was £6,000.

HALIFAX.—Mr. C. Hodgson Fowler has prepared plans for the new Parish Church of St. Hilda, estimated to cost £6,000.

HULL.—A new block of offices in Lowgate, known as Middleton Chambers, was opened recently. The architect was Mr. B. S. Jacobs, F.R.I.B.A., Hull, and the general contractors were Messrs. Quibell, Son, and Greenwood, Ltd. The sub-contractors were: Carpenter and joiner, Mr. F. Singleton; plumber, Mr. F. Abba; slater and tiler, Messrs. Hunter and Son; painter, Mr. J. W. Maples; electrician, Mr. A. Shaw. The grates, chimney pieces, and tiles were supplied by Messrs. King and Co., Ltd.; the mosaic flooring in entrance and hall was laid by Messrs. Diespeker, of London; and the wall tiling by Messrs. Pilkington, of Manchester.

LONDON, DENMARK HILL, S.E.—The foundation work for the new King's College Hospital buildings has been commenced. Mr. William A. Pile, F.R.I.B.A., is the architect.

LONDON, W.C.—The Strand Palace Hotel, which is being erected for Messrs. J. Lyons and Co., Ltd., on the site of Exeter Hall, in the Strand, is approaching completion, and is intended to be ready for the public by June next. The exterior of the building, which has only a narrow frontage to the Strand, is faced with Carrara ware in French Renaissance style, and the interior decoration is to be carried out in that style and also in that of the English Georgian period. The main entrance is from the Strand, and leads to a lounge and thence to the winter garden, 130ft. long. The main dining hall is 94ft. by 59ft., accomodating 250 people; the drawing-room, 40ft. by 31ft., both opening from the winter garden. The grill room, smoking-room, and billiard-room are in the basement, reached by a double stair from the main hall. There are 450 bedrooms. The total cost of construction and equipment is estimated at £230,000.

POLLOKSHAWS, SCOTLAND.—The Sir John Maxwell School has been rebuilt on the site of the old school. The architectural treatment adopted is a bold and simple phase of the Renaissance, and red stone was used from the quarry at Locharbriggs, Dumfriesshire. The cost, including the fittings and furnishings, is estimated at £15,660, and the number of children for whom places are provided is 1,260. The architect is Mr. John Hamilton, F.R.I.B.A., while Mr. George B. Walker, I.M., is the measurer.

ROBERTSBRIDGE, SUSSEX.—The village institute, just completed, was designed by Mr. George Hornblower, F.R.I.B.A., London, and opened on Wednesday, the 6th inst. The building comprises a large hall arranged for theatrical performances, and capable of seating two hundred persons comfortably, a large billiard-room, games-room, library, and other accommodation. The building conforms with the style of the bulk of the houses in Robertsbridge, and the roof is covered with hand-made local tiles. Mr. S. Harvey, of Rye, was the builder, and Mr. James Gray, of Chelsea, provided the heating installation.

ROCHDALE.—The Town Council has accepted the tender of Messrs. Thompson and Brierley, Bury, at £8,285, for the erection of the Castleton branch baths.

SKELMANTHORPE.—A new Liberal Club is in course of erection at a cost of £1,000.

THE BUILDERS' FOREMEN'S ASSOCIATION.

The fifteenth annual dinner of the Builders' Foremen's Association was held on Saturday evening last in the King's Hall of the Holborn Restaurant, where about 250 gentlemen sat down under the chairmanship of Mr. W. Millar Higgs (Messrs. Higgs and Hill). Among those also present were: Messrs. A. D. Ford (president of the association), B. Rees (secretary), Edmund Wimperis, F.R.I.B.A. (Messrs. Wimperis and Best), F. G. Rice (Messrs. Rice and Son), W. Matthews Hill (Messrs. Higgs and Hill), J. W. Sawyer (vice-president), T. Sturge Cotterill, J.P., etc. After the usual loyal toasts, the chairman submitted "The Builders' Foremen's Association." As the name implied, he said, this was an association composed mostly of builders' foremen, although they had amongst their members many leading men of the allied trades, and also many clerks of works, who were gladly welcomed as members of the association, for they looked upon them in their business life, for the most part, not as men who were placed upon their buildings to prevent scamping and work of an inferior nature, but as men who were there as their helpers and friends, and who were of infinite value in settling many minor points in the course of the building's construction, that would necessarily be otherwise delayed. They would all agree with him that the builders' foreman was, generally speaking, a jolly good, all round man—(hear, hear); his position was by no means an easy one, his responsibilities were great, and in these days of competitions, when prices were cut to the lowest farthing, and then a percentage taken off the lump sum in order to secure the work (or, at least, to get somewhere in the running), the builders' foreman, or foreman of the allied trades, had all his ingenuity taxed to be able to bring his job out in a proper manner in justice to the architect and client, and to the good name of the builder, or firm by whom he is employed, at a profit, or, at least, without a loss. Again, in times of depression and slackness of trade like they had been passing through of late, the life of the man who took on and discharged the men was a distressing one, for if he had a heart at all, to see men whom he knew to be honest workmen in want, it must be hard indeed for him to act justly to his employer, and, at the same time, with feeling towards his fellow men. An association of this kind, properly conducted, as this association was, could not be anything but a real help to the foreman. As architects and surveyors and builders had their separate institutions and benevolent associations, and the working men had their various trade unions for mutual help, so it was essential for the leading men of every trade to be bonded together in a society of this kind, whereby they could derive help and instruction in their business life, and some practical assistance when they were in need. He was glad to say that the Builders' Foremen's Association was all this to its members. Since it was founded, in June, 1894, it had steadily increased both as regards membership and usefulness. Lectures on trade matters were from time to time arranged, visits to buildings in course of erection, and various works frequently took place, when the members of the association had the opportunity of exchanging views with one another upon matters connected with their daily work, thus quickening their interest in what they had to do day by day. Although last year had been a most trying one, the Builders' Foremen's Association had held its own, and he would strongly urge any young foremen who might be with them that night, and who were not at present members, to join at once. Unity is strength, and young blood was gladly welcomed, and would receive much help by belonging to an association of this kind. The association had a contingent fund for the purpose of assisting to a limited degree members that had got in a position of distress, and the insurance fund of the association provided the sum of £10 to the widow of a deceased member. Another fund had lately been inaugurated, that known as "The Pension Fund." (Cheers). This came into operation for the first time this year, and he having the honour to preside at that dinner, had made a special appeal to most of those with whom his firm had business relationship, in view of being able to hand over a good amount which should give this fund a good send off. (Hear, hear.) Many who would have gladly subscribed to so good a cause had written to him saying that, owing to the great depression in their trade, they felt that they could not give, and he knew the cause of their writing this was all too true. On the other hand, he had received many kind letters, enclosing cheques, and he felt most grateful to those gentlemen, many of whom he was glad to see with them that night, for so generously responding to his appeal, notwithstanding these depressing times. He would not detain them by reading the list through, but the full list would appear in the next quarterly report. He had much pleasure in being able to hand their hard-working and most energetic secretary a cheque for £125 4s. He might say that the pension fund, as it now stood, provided for an allowance of 5s. per week to a member of the association of 15 years' standing, of 60 years of age, if not at work, and he was glad to tell them that this benefit was extended to the widows of deceased members. The fund was the only object for which the association sought outside pecuniary assistance, and to establish this fund upon a firm basis must be the object of every member. He should like to see sufficient funds to justify a grant of 7s. 6d. per week to members of the Builders' Foremen's Association, who had spent so much of their lives in superintending the erection of the beautiful buildings they had in this great city of theirs. (Cheers.)

MR. W. MILLAR HIGGS (MESSRS. HIGGS & HILL).

The toast was enthusiastically received, and Mr. A. D. Ford, the president of the association, with whose name it was coupled, in responding, said the Association welcomed the specialist in the various departments of their work, knowing, as they did, that it was only by specialisation that improvement could be secured and perfection approximated. They knew something of the great qualities possessed by their leading men in the building industry, and these qualities only needed closer union, they believed, to revive trade and improve the material interests of all concerned. The high culture and integrity that distinguished their architects and surveyors, the great business ability and sense of justice and fair play that characterised their employers, the skill and experience which were their pride and boast no less than their fidelity of contract, were qualities the co-operation of which should dispel the cloud of depression that had wrought such havoc to the material interests of so many, and should give place to a future brighter and more prosperous, they believed, than had ever been in the past.

Mr. Edmund Wimperis, F.R.I.B.A., in proposing the toast of "The Building Trades," said that it had come to be required of an after-dinner speaker that he should not be destitute of humour. He found himself somewhat at a loss, because while other great industries, such as golf and fishing had their own stories and their own humour, so far as his experience went, the great building trades were without any special humour that he was aware of. But there was a more serious side to the toast which he had to give them. The great building trades and the great allied trades represented to this country something more than an industry. They represented very largely the history of this country. It was not a modern growth, this building trade; it was as old as man himself, and it was not a stationary growth. It was as new as the Japanese Empire, and it was a scientific growth. He noticed in the paper that day that the Japanese had a cure for earthquakes and were building in ferro-concrete. That meant a very big thing, and, speaking as an architect, he felt that the subject was too big for him, with all his big ideas, to handle successfully. Of course, politics at such a gathering as that were naturally and properly tabooed, but he could only say that, apart from politics, they would be cravens, and worse than cravens, if they hesitated to take any step which might be a cure for the great depression which this great industry had undoubtedly been going through. Let them think for a moment of the way in which this industry spread the money which was earned in it. Let them take any great building that they liked and think how far the ramifications spread and the numberless channels into which the prosperity of that building had been split, and the numberless homes into which some of the money which that building cost had gone. That meant that the prosperity of the building trades was a matter not only of happiness, but of life and death in thousands of homes in this country.

Mr. F. G. Rice, whose name was coupled with the toast, expressed his thanks on behalf of the building trades for the way in which the toast had been received. They were, he said, certainly living in times of very great depression and anxiety. Some considered that the new patent law would require more factories to be built, and said there was no doubt there would be a change in building. He thought it was known to most of them that the London County Council had before them a Bill to permit structures of the iron skeleton type and ferro-concrete to be erected with thinner walls, and as reference had been made to the specialist, he would like to suggest to them all to become specialists in that form of construction. In his opinion it would be a type of building largely used in the future, and he thought it behoved every one of them to make themselves acquainted with its principles, so that when their employer had a job of that kind to do, instead of having recourse to the specialist, he might give it to Bill, Tom, Harry, or Joe, whom he had known for many years, and in whom he had every confidence. This was the first time he had come to one of their dinners, and he expected to have heard the vexed question as to who put up a building satisfactorily settled. Three people claimed to erect a building—the builder's foreman, the builder, and the architect. He would remind them of the Prince of Troy, who was asked to adjudicate between three fair ladies, and to give the golden apple to either Venus, Juno, or Minerva. He was unwise to give it to Venus, with the result that Minerva and Juno pursued him all the days of his life. In regard to the erection of a building, he would like to say that all three were responsible, and that without all three the beautiful buildings they had in London could not be erected. He had been struck sometimes with the manly and straightforward manner in which the foreman met the architects, and he felt sure the architects appreciated it. Emerson said: "Nothing astonishes man so much as common sense and plain dealing." He read the other day of a Babylonian building law, which enacted that if a builder had built a house and had not made his work firm, and if the house had fallen down and killed its owner, the builder should be put to death. That was a forerunner of their present Building Act. Builders never knew what was going to happen with the Building Act. It required a lawyer, architect, and builder combined to understand it, and then they had to go to someone at the County Council to explain it after all. In conclusion, he hoped they would all have a prosperous year and find plenty of work.

The toast of "The Architects and Surveyors" was submitted by Mr. W. Matthews Hill, who said that the architect represented the theory and the general foreman the practice, and each admired in the other that quality without which no work could be brought to true perfection. In regard to the surveyor, they could only call him the general foreman's guide and comforter, for were not his quantities the best guide a foreman could have, and was he not a true comforter when he came to take up the general foreman's list of extra works?

In replying to the toast, Lieutenant-Col. G. E. Holman asked who was it who could make a bag of cement go farther than anyone else in this world? It was the foreman. Who was it who could get rid of all the batts which came to a building? The foreman, of course. And who was it who, when the building was completed, and the poem which the architect had seen in his mind and put on paper, was crystallised into bricks and stone, who was it who took all the credit for the work The foreman? No; the master, the builder. He owed a great deal to the builders' foreman. Might he say that he thought the builders owed a great deal to the foreman too, far more sometimes than they knew, and, he was sorry to say, far more sometimes than was recognised by the builders.

Mr. J. W. Sayer submitted the toast of the "Visitors," and Mr. T. Sturge Cotterill, J.P., briefly responded.

Mr. W. Faldo proposed the health of "The Chairman." There were, he said, many thousands of hearts and many hundreds of homes that had been made very much happier by the work which their Chairman had done outside his ordinary business. The toast was warmly received, and the Chairman, in response, briefly expressed his thanks for the reception of the toast and the pleasure it gave him to be present. In conclusion, he said he had pleasure in announcing that his list for the Pension Fund now amounted to £135 14s.

During the dinner selections were played by the band of the 103rd London Company Boys' Brigade, and the toasts were interspersed with songs and other items.

Federation News.

MONTHLY REPORTS.

YORKSHIRE FEDERATION.
Secretary: J. Davidson.

The annual general meeting was held at the Town Hall, Wakefield, on Thursday, December 17th. Mr. J. Biggin, President, was in the chair, and 53 delegates recorded their names in the attendance book.

The annual report and balance sheet of the Executive Council for the year ended November 30th, 1908, was presented and considered. Proof copies had previously been supplied to the members, and, on the motion of the president, seconded by Mr. W. T. Ledgard, the report and statement were taken as read.

On the motion of the president, seconded by Mr. W. R. Thompson, the report and balance sheet were approved and adopted; and it was decided to print 1,500 copies for circulation among the members, the final printing to be left over to January, until the new representatives are appointed.

The Federation passed with acclamation a resolution submitted by Mr. W. R. Thompson, seconded by Councillor W. G. England, J.P., tendering to Mr. A. J. Forsdike the deep gratitude and high appreciation of the Federation for the most valuable services he had rendered as treasurer during the past four years. Notwithstanding the prevailing depression during this period, Mr. Forsdike had, by genial and persistent efforts, maintained the finances in a comparatively satisfactory condition.

Mr. J. Biggin, the retiring president, stated that he had the greatest pleasure in proposing Mr. W. R. Thompson, of Dewsbury, as president of the Federation during the ensuing year. Mr. Thompson had been unanimously nominated for the office, and his ability and qualifications were well known to the members. It was therefore not necessary to say anything further, as Mr. Thompson's splendid record of the past, coupled with his willingness to carry out the work, had already received signal recognition from his fellow-members. The motion was seconded by Mr. W. T. Ledgard, who briefly referred to the services rendered by Mr. Thompson to the Federation since its formation.

The motion was carried with acclamation.

Mr. Biggin thereupon invested Mr. Thompson with the insignia of office, and tendered his hearty congratulations on his appointment. He pointed out that the satisfactory discharge of the duties would involve a great sacrifice of time, and the careful consideration of many and varied subjects. He estimated that during his year of office he had travelled about 6,824 miles on Federation business. Mr. Thompson then took the chair, and thanked the members for the honour which they had conferred upon him. He made a strong appeal for a deeper interest in the work of the local associations, as both the County and National Federations to a large extent depended upon these being maintained in a strong and healthy condition. He sincerely hoped that the optimistic views which had been expressed in many quarters of signs of a revival in the building trade would soon begin to fructify, and that members might at an early date find encouragement and congratulation in an increased volume of work. He moved that the best thanks of the Federation be officially tendered to Mr. Biggin for his most valuable services as president during the past year, and that his name be added to the list of ex-officio members of the Council.

Ald. W. H. Jessop, J.P., seconded the resolution. Mr. Biggins' services, he said, were undoubtedly deserving of the fullest acknowledgment which the Federation could bestow. He hoped that his health would be maintained and that he would continue to give the Federation his counsel and advice for many years to come. Mr. Biggin expressed his thanks to the mover and seconder of the resolution for their kind references, and to the Federation for their hearty response.

On the motion of the President, seconded by Mr. A. W. Sinclair, Councillor W. G. England, J.P., of Barnsley, was appointed senior vice-president for the ensuing year; and on the motion of the president, seconded by Mr. W. Irwin, Mr. A. J. Forsdike was appointed junior vice-president. This concluded the business of the annual meeting, which was followed by the monthly meeting of the Council.

BRADFORD ASSOCIATION.
Secretary: J. Davidson.

The annual meeting of the Bradford Association was held on December 23rd. Mr. T. E. Taylor, president, was in the chair, and, in addition, 13 members were present. A short resume of the work of the association was given by the secretary, and the treasurer submitted a statement of receipts and payments, which was duly approved and adopted. The thanks of the association were tendered to Mr. J. Moulson for his valuable services as treasurer, and to Messrs. T. Obank and C. W. Booth for auditing the accounts during the year. The following officers were appointed for the ensuing year:—President, Mr. T. E. Taylor; vice-presidents, Messrs. R. Raper and C. W. Booth; treasurer, Mr. J. Moulson; auditors, Messrs. T. Obank and C. W. Booth. The General Committee was also appointed, together with representatives of the Local Conciliation Board and to the Yorkshire Federation. The best thanks of ,the association were tendered to the president, and to the representatives to the Yorkshire Federation, for their valuable services during the year.

Messrs. C. W. Booth and W. H. Holroyd were appointed to represent the association at the National Federation meeting in January. It was resolved to invite the Yorkshire Federation to hold the February meeting in Bradford. The president afterwards entertained the members to tea.

LEEDS ASSOCIATION.
Secretary: J. Davidson.

A meeting of the Leeds Association was held on December 8th, Mr. W. Irwin in the chair. The chairman and secretary were requested to see the highways surveyor with respect to the recent practice of charging for paving repairs by time instead of by measurement.

The General Committee reported that they had investigated a difference which had occurred between two members, and which, as a result of the meeting, had been adjusted to mutual satisfaction.

The question of tenders for repairs for the Education Committee was considered, and it was resolved to send a letter with respect to the same.

A discussion took place as to payment of apprentices on completion of indentures, and also as to arrangements for the more prompt inspection of drains by the corporation staff.

LEICESTER ASSOCIATION.
Secretary: S. A. Dove.

Business in the building trade seems to be improving somewhat in the Leicester district.

A meeting of the General Council was held on December 22nd, when it was decided to hold the annual meeting of the association on February 4th, to be followed by a dinner.

Since the demolition of the Floral Hall (on which site, now stands the Palace Theatre), there has been a lack of accommodation for concerts, etc., and as a result of this the Leicester Town Council have lately been discussing the advisability of erecting a public hall. A committee was appointed to secure a site, and they proposed that a hall should be erected on land belonging to the corporation in Regent Road, close to the Victoria Park. The committee were restricted to a limit of £15,000, which sum seemed very inadequate for the purpose of a public hall. However, the committee secured an estimate from a Norwich firm of contractors for the sum of £13,650, and guaranteed not to exceed this amount. A deputation from the Amalgamated Society of Carpenters and Jointers waited upon the chairman of this committee informing him that the firm it was proposed should put up this building was not considered a fair house

The report of this committee was brought before a full meeting of the Town Council, and after considerable discussion for and against the adoption of the report of the committee, the proposal was defeated by a small majority.

This matter caused a great deal of correspondence in the local papers, as the proposed site is quite a mile from the centre of the town, and it has been naturally contended that a public hall should be in the centre of the town.

PRESTON ASSOCIATION.
Secretary: John Tomlison.

The fifteenth annual dinner of the Preston Building Trades Employers' Association was held at the New Association Rooms, Mount Street, Preston, on Wednesday evening, December 16th, when the president (Mr. Thomas B. Garnett) occupied the chair. There were about 50 members and friends present. After the usual loyal toasts, the president proposed "The Preston Building Trades Employers' Association." Mr. R. H. Catterall, in responding, expressed his opinion that they had done a very good thing in opening the new premises, which would offer opportunities for the members to meet each other at any time to discuss trade questions or for social intercourse. With regard to relations with the operatives, he was pleased to say that in the whole of his experience he never remembered anything in the form of a tyrannical action with the operatives of Preston.

Mr. E. Shorrock proposed "The Town and Trade of Preston." Mr. J. Cartmell, in responding, said there was no doubt that the cost of food, etc., was cheap in Preston as compared with many other manufacturing towns, it being so centrally situated, and he thought that fact should be taken more into consideration with regard to the wages of the men. Referring to trade matters generally, he attributed the bad times to the heavy rates that were being imposed by corporations, and to the fact that, rather than speculate in building, people preferred to accept the small interest on bank deposits.

Mr. W. Croasdale proposed the toast of "The President and Officers," to which Mr. T. B. Garnett responded. Mr. W. Cooke, junr., also replied.

SHEFFIELD ASSOCIATION.
Secretary: Thos. Smith.

The following paragraphs were held over from the report of the Sheffield Association given on p. 43 of our issue of January 13th:—

A letter was read from the secretary of the Antwerp M.B.A., thanking the association for its expressions of sympathy in connection with the lamented death of the Burgomestre of Antwerp, who was an honory president of the Antwerp Association.

A further letter was read from the secretary to the Builders' Merchants' Association, asking the M.B. Association for their suggestions as to the establishment of a preferential tariff for builders.

A letter was read from Mr. A. Mastin resigning his position as treasurer of the association. Mr. Mastin pointed out that it was mostly on account of ill-health that he felt compelled to tender his resignation of the post he had held for ten years. He should still take the same interest in the work of the association. The letter was received with sincere regret. Much sympathy was expressed for Mr. Mastin in his recent illness, and congratulations on his convalescence were tendered. Mr. Forsdike and Mr. Cook voiced the general feeling in remarking that the loss of Mr. Mastin as treasurer would break a link with the happy relations of the past, and they had got to look to him as treasurer for such a long period that they positively could not imagine anyone else occupying the position. As an Association they could not afford to lose him, much as they regretted the circumstances which had led to his decision. They felt sure that, on the unanimous request of the association, he would be prepared to reconsider his decision. Mr. Forsdike moved, and Mr. Cook seconded, a resolution instructing the secretary to convey the feel-

At the monthly meeting of the Executive Council, Mr. W. R. Thompson, president, occupied the ing of this meeting to Mr. Mastin, and on the motion of Mr. Longden, seconded by Mr. Roper, the president, Mr. Forsdike and Mr. J. Biggin were appointed as a deputation to see Mr. Mastin and use their influence in persuading him to withdraw his resignation.

The treasurer's statement showed the usual progress in comparison with previous years, the amount collected to date for subscriptions and levies being £77 19s. 10d. in excess of 1906, and £41 7s. 10d. in excess of 1907. This satisfactory result, it was pointed out, was due in some measure to the success of the new method of assessment, whereby members, with scarcely any important exception, made a return of annual wages and number of men employed to the secretary, such returns being entered in a locked ledger, and not being disclosed under any circumstances whatever to any other official of the association. By this means members paid on the same basis as that on which they paid their insurance, and the objectionable and unsatisfactory assessment, which at best represented but the guesswork of a committee, was avoided. The instalment of this system had involved an enormous amount of extra clerical labour, and the committee appointed at last meeting had come to the unanimous decision that the much-improved position of the association warranted an increase in the secretary's remuneration. Mr. Forsdike, speaking on behalf of the committee, moved that the secretary's salary be increased to £50 per annum, and Mr. Cook, in seconding, suggested that the increase should be made retrospective, and apply to the current year. The president and Mr. Powell supported, and the resolution was unanimously carried. Mr. Forsdike then called attention to the very satisfactory manner in which the secretary had carried out the arrangements for the trip to Belgium, and moved that a sum of ten pounds be paid to the secretary, as compensation for the loss of time, etc., involved. Mr. A. T. Biggin seconded, and said that the organisation of the trip was a credit to the secretary and the association. The resolution was supported by Messrs. Longden, Boot, and Jones, and unanimously carried

The Secretary thanked the association for the generous manner in which they had met him. It was his ambition when appointed, over two years ago, and was his ambition still, that the association should prosper. He had put a large amount of work into it, and although there were disappointments, the net result of two years was that the membership was about double. He hoped that the association was still only on the threshold of its success, and that he would always be able to justify their confidence.

The next item of the agenda established a record, almost a dual record. In the first place, there was a resignation, which was a rara avis, and in the next place there were twenty new applications for membership of the association, this being the largest number of applications presented at one meeting.

Some discussion took place as to the amount of contribution to the Yorkshire Federation, it being pointed out that Sheffield had contributed in respect of associate members on an ordinary members' basis, and in its total of £59 odd had contributed the largest amount of any association in the Federation.

In the absence of the members who raised the question of the status of membership and the use of the national crest, the matter was left to next meeting.

The committee appointed to consider the advisability of the adoption of day-work prices stated that they were not yet prepared to present their report. They had decided to obtain further information from other towns.

SHIPLEY AND DISTRICT ASSOCIATION.

Secretary: J. Davidson.

The annual meeting was held on December 9th. The secretary's report and statement of income and payments was submitted and approved. Representatives were appointed to attend the annual general meeting of the National Federation in January. The following officers were appointed for the ensuing year:—President, Mr. Walker Cryer; vice-presidents, Messrs. H. Dawson, S. Pitts, and A,. Parker; treasurer, Mr. F. Pitts. Messrs. A. Kendall and J. Midgley were reappointed as representatives to the Yorkshire Federation. An interesting discussion on several matters of trade importance followed.

SOUTH SHIELDS ASSOCIATION.

Secretary: J. G. Robertson.

The monthly meeting of the South Shields Association was held in the Victoria Hall on Friday evening, January 8th, the president (Councillor J. T. Armstrong) in the chair. Despite the most inclement weather, there was a large number of members present. On the National secretary's circular being read respecting the number of members and number of men and apprentices employed, a long discussion ensued on the apprentice aspect of the question. All seemed to be agreed that for some time it has been practically impossible to get lads to become apprentices. It was related as a fact that more than one firm had advertised over three weeks and had not received a single application for apprenticeship. On the other hand, in this district the engineering employers have constant applications from lads wanting to become apprentice engineers. The hope was expressed that the matter would be on the agenda for the National meeting to be held in London on January 27th, and that an effort would be made there, if not to solve the question, at any rate to throw out suggestions that might help to lead to the desired solution.

Attention was drawn to the recommendations that had been made by the committee inquiring into the operation of the working of the "Fair wages clause" in all Government work. It was strongly felt that serious attention would have to be given to this question, so that the trade unionist idea of incorporating the "Fair wages clause" into all Government contracts and work might be opposed.

The president, on the motion of Mr. J. Moore, seconded by Councillor W. J. Robertson, was unanimously deputed to attend the National annual meeting. Councillor J. T. Armstrong also promised to attend.

Messrs. J. T. Armstrong, A. Ross, T. Anderson, and W. V. Jary were elected our representatives on the Tyne and Blyth Federation of Building Trades Employers. The telephone card was finally approved for distribution.

Trade and Craft.

Uralite Asbestone.

The announcement that large contracts from the Admiralty and from the London County Council have been recently placed with the British Uralite Company (1908), Ltd., 16, St. Helen's Place, London, E.C., will doubtless stimulate enquiry for the firm's products. Notable among these is Asbestone, which is an improved make of the well-known asbestos cement slate. Asbestone has many uses. Light in weight, yet dense in texture, it effects a considerable saving in roof-timber, upon which it imposes comparatively little weight, and is an excellent non-conductor. Being tough and durable, it is but little liable to breakage, either in transit by land or sea, or when being washed, or when established in position. These qualities render it of particular value for the tropics, transport being rendered easy and unusually free from risk of damage, while the non-conductivity of the material is, in climates that are subject to fiercely hot sunshine, a consideration of great importance. Its immunity from attack by the devastating white ants and other destructive vermin is another strong recommendation. The material is also incombustible, and resists acid and sulphur fumes. For roofing, it may be used in sheets 6ft. by 3ft., or in the form of tiles 18ins. square, or in slate style, 20ins. by 10ins. The larger sizes, of course, lessen the labour of fixing. In sheet form it is largely used for lining ceilings, for partition work, and particularly for the construction of bungalows. Its value as an insulator has been recognised in its extensive adoption in electrical work—for cable casings, switchboards, etc. Asbestone is manufactured in any size up to 6ft. by 3ft., and in thickness from ⅛in. to 1in. The thickness most in demand is 3-16ths inch, for which the price is 1s. 10½d. per square yard; other thickness being charged for at a proportionate rate. It can be had white or grey at the price mentioned, or red at ten per cent. higher cost. It can, of course, be decoratively treated, and is much in use for panelling. It is damp-proof as well as fireproof, and, altogether, is a material that the architect is likely to find increasingly useful in a wide range of adaptability. That it is of British make is a guarantee of uniform excellence in the product.

Revolving Shutters and Collapsible Gates.

Messrs. Dennison, Kett and Co., engineers and contractors to the War Office, H.M. Office of Works, London County Council, etc., have issued a catalogue of their revolving shutters, collapsible gates, etc., in which the illustrations are uncommonly clear and elucidatory. This characteristic is especially notable in the full-size sections of revolving shutters. These shutters are made either with pinewood laths or with laths of iron or steel; the wood laths being connected with steel hinges, or with steel or copper bands. Various types and patterns are described, many of them made on the self-coiling principle for openings up to 6ft. wide, while for more extensive openings worm-wheel gearing is recommended. In some instances the noise caused by coiling is reduced to a minimum by leather strips placed on the edges. Various plans of arranging coils of revolving shutters, and various positions for sunblinds are indicated in a series of sectional illustrations. Shutters for dividing large schoolrooms, etc., are included Improved non-slipping stair-treads of rolled steel, with lead filling, are for fixing to iron, stone, or wood steps that have become worn. They are stocked in various convenient widths, and are supplied either with or without nosing. The patent improved collapsible gates (Dennison's patent) are made in various sizes, in one piece to collapse to one side, or in halves to collapse to both sides. It is explained that in these gates the diagonals are fixed in a solid cross-head, dispensing with the usual loose slippers, and making a thoroughly rigid gate. Semi-prism and lens pavement and vertical lights are also shown, and several pages are devoted to various patterns of motors. Messrs. Dennison, Kett and Co.'s City office is at 11, Queen Victoria Street, E.C.

Mainly About Mantel Registers.

Two catalogues received from the Carron Company, of Carron, Stirlingshire, who have London showrooms at 15, Upper Thames Street, E.C., and at 23, Princes Street, Cavendish Square, W., show, respectively, a general list of the firm's goods and a special list of mantel registers of select designs. In the former various kinds of stoves and ranges are included, besides baths and lavatory fittings, and a large number of general castings for house, farm, or garden. In the latter, more than sixty designs are shown of Carron mantel register grates, mantels and overmantels, and mantelpieces. Many of these designs are undeniably handsome, and the collection offers an embarrassment of choice. Chasteness and restraint are observable throughout.

Coming Events.

Thursday, January 21.

Yorkshire Federation of Building Trades Employers.—January meeting, followed by the annual dinner. 6 p.m.

Leicester and Leicestershire Society of Architects.—Address by Mr. W. B. Keites.

Friday, January 22.

Birmingham Architectural Association. — Mr. Arthur S. Dixon, M.A., on "Early Roman Churches."

Royal Sanitary Institute.—Provincial Sessional meeting. Visit to the Manchester Royal Infirmary, 2.30 p.m.; Discussion on "The Manchester Royal Infirmary from the Hygienic, Sanitary and Aesthetic Points of View," to be opened by Mr. Edwin T. Hall, V.P.R.I.B.A., followed by Mr. John Brooke, F.R.I.B.A. 7 p.m.

Architectural Association.—Special general meeting, 7.30 p.m., to consider proposed alterations in the by-laws; also ordinary general meeting, with paper by Mr. J. H. Markham, on "Reinforced Concrete."

Monday, January 25.

University of London.—Mr. Banister Fletcher, F.R.I.B.A., on "Belgian and Dutch Renaissance (and Modern) Architecture." 8 p.m.

Tuesday, January 26.

National Federation of Building Trades Employers.—Meeting of 1908 Council, 10.30 a.m. Meeting of 1909 Council, 2.30 p.m. Both in the Balmoral Room of the Trocadero Restaurant, Piccadilly Circus.

Wednesday, January 27.

National Federation of Building Trade Employers.—Annual general meeting, Trocadero Restaurant, Piccadilly Circus, 10.30 a.m.

Thursday, January 28.

Institute Members' Club.—Meeting in R.I.B.A. Smoking Room, 5 p.m.

Monday, February 1.

Royal Institute of British Architects.—President's Address to Students, and Presentation of Prizes.

Liverpool Architectural Society.—Mr. Mervyn E. Macartney, F.R.I.B.A., on "The Three Churches of St. Paul."

Wednesday, February 3.

Northern Architectural Association.—Ordinary meeting. Paper by Mr. H. Barnes, A.R.I.B.A., 7.30 p.m.

PRACTICAL NOTES
FOR
ARCHITECTURAL DRAUGHTSMEN

BY

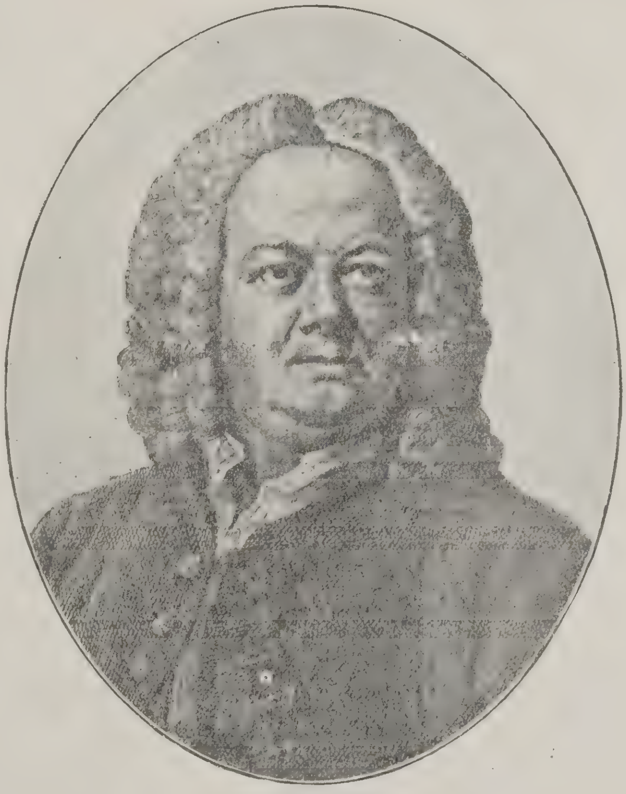
A. W. S. CROSS, M.A., F.R.I.B.A. and A. E. MUNBY, M.A., A.R.I.B.A.

Part I. The Orders and their Application.

Plate 1. Introduction.
„ 2. The Four Orders.
„ 3. The Tuscan and Doric Orders in detail.
„ 4. The Ionic and Corinthian Orders in detail.
„ 5. Details of Imposts and Arch Moulds.
„ 6. Order upon Order and Intercolumniation.
„ 7. Doorways and Pediments.
„ 8. Windows and Entablatures.
„ 9. Windows, rusticated treatment.
„ 10. Venetian and other Windows.
„ 11. Niches and their Treatment.
„ 12. Block Cornices, Balusters, Entablatures and Entasis.

Part II. Details of the Orders.

Plate 13. Rules for Setting out the Volutes of the Ionic Capital by (1) Gibbs. and (2) Vignola and Palladio.
Plate 14. Details of Ionic and Corinthian Capitals.
„ 15. Examples of Arcading (Ionic and Doric).
„ 16. Examples of Arcading (Tuscan and Corinthian).



JAMES GIBBS.

Part III. Constructional Details.

Plate 17. Domes.
„ 18. Pendentives, Circular Staircases and Wreathed Columns.
„ 19. Gothic Tracery and Vaulting.

Part IV. Perspective.

Plate 20. Notes on Architectural Perspective.
„ 21. Setting up a Perspective.

Part V. Shadows.

Plate 22. Explanatory matter regarding the projection of Shadows.
„ 23 to 27. Examples illustrating Shadows on various architectural details.

"PRACTICAL NOTES" contains a mass of valuable information which it is essential that the Architect should know to enable him to give that harmony, grace and proportion which exemplified the works of Ancient Greek and Roman Artists, many of which are still the admiration of the whole world. It is invaluable to students preparing for the examinations of the R.I.B.A., showing how to draw The Orders correctly with the smallest possible amount of work and study.

Price for Complete Work, 12/-, including Portfolio.

We shall be pleased to forward a copy of this work on approval to any of our subscribers.

PUBLISHED BY . . .

TECHNICAL JOURNALS, LTD.,
Caxton House, Westminster, London, S.W.

Descriptive Leaflet sent Post Free upon application.

Publisher's Notices.

Offices: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address: "Buildable, London."

Telephones: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls	8	8
By post in the United Kingdom	10	10
By post to Canada	13	0
By post elsewhere abroad	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application.

Situations Wanted-

4 lines (about 28 words), one insertion	1s. 6d.
Each additional line	6d.
Three insertions*	3s. 0d.

*This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bargoed (Glam.).—Accepted for the erection of a higher elementary school for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., County architect, Cardiff:—

T. F. Howells, Caerphilly	£7,819	1	2

Birmingham.—For additions and alterations to Messrs. S. C. Larkins and Sons' premises, Livery Street and Barwick Street. Messrs. W. H. Ward, architects, 30, Paradise Street, Birmingham:—

First Contract.			
J. Barnsley and Sons	£458	0	0
G. Webb and Son	427	0	0
G. Robinson	397	0	
W. George and Co.	335	0	
W. Sapcote and Sons*	334	0	0
Second Contract.			
J. Barnsley and Sons	433	15	0
G. Webb and Son	389	0	0
G. Robinson	358	10	0
W. George and Co.	315	0	0
W. Sapcote and Sons*	310	0	0
Third Contract.			
J. Barnsley and Sons	405	0	0
G. Webb and Son	399	0	0
G. Robinson	364	0	0
W. Sapcote and Sons*	302	0	0
W. George and Co.	290	0	0
Fourth Contract.			
G. Webb and Son	345	0	0
J. Barnsley and Sons	343	0	0
G. Robinson	325	0	0
W. George and Co.	265	0	0
W. Sapcote and Co.*	263	0	0

*Accepted.

Berrywood (Northants).—For isolation hospital at the asylum, Berrywood, for the Committee of Visitors of the Northamptonshire County Council. Mr. W. B. Partington, surveyor, Berrywood:—

R. Carlyle, Manchester	£2,903	0	0
T. Higgs, Northampton	2,897	0	0
R. Cosford, Northampton	2,849	0	0
W. Higgins, Northampton	2,718	0	0
E. D. Sharman and Son, Northampton	2,700	0	0
G. F. Sharman, Northampton	2,698	0	0
A. P. Hawtin, Northampton	2,674	0	0
A. J. Chown, Northampton	2,663	0	0
E. Green, Northampton	2,637	0	0
J. Martin, Northampton	2,570	0	0
T. Hickman, Market Harboro'	2,560	0	0
W. Heap, Northampton	2,497	0	0
W. W. Webster, Guilsborough	2,487	15	0
G. L. Fisher, Northampton	2,342	0	0
W. W. Roberts and Co., Ltd.,* Weedon	2,285	10	0

*Accepted.

Caldecote (Bedfordshire).—For erection of a Wesleyan chapel and schools. Mr. T. Cockrill, A.M.I.C.E., architect, Biggleswade:—

G. Redhouse and Son, Stotfold	£1,684	15	0
J. W. Bailey and Sons, Ashwell	1,592	10	0
W. Haynes, Sandy	1,532	0	0
G. Wrycroft and Son, St. Neots	1,399	0	0
C. Wright,* Langford	1,363	10	0

*Accepted.

Dunton (Leics.).—For enlargement of Bassett School, for the Leicestershire County Council Education Committee:—

G. L. Martin	£916	0	0
E. Haycock and Sons	900	0	0
King and Ridley	885	0	0
H. H. Garlick	885	0	0
J. Cole and Sons	875	5	0
P. Rourke	865	0	0
E. Fox	859	19	0
E. W. Garlick	854	10	0
E. Lord	840	0	0
C. Cooke	828	6	0
J. Rudkin and Sons	808	10	0
F. Oldershaw	781	10	0
W. Potter,* Blaby	780	9	6

*Accepted.

Gellygaer (Glam.).—Accepted for addition to the Council School, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, architect, Cardiff:—

Davies and Lloyd, Senghenydd	£1795

(*Tenders continued on page viii.*)

ROOFING SLATES.
Velinheli, Penrhyn and Westmorland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

'SCHOLA' HOOK
(Regd.)
200 Schools
200,000 Hooks.
Lists & Estimate Free.
Sole Maker
Brookes & Co. (LTD.),
4, CATEATON ST. MANCHESTER.

"THE" LIFT & HOIST Co.,
Also Revolving Shutters,
Iron Doors and Iron Fire-Escape Stairs,
Premier Ironworks,
DEPTFORD, S.E.

BLINDS?
Yes! Every kind, and Casement Curtains.
HOWELL & CO.,
100, Albion Street, LEEDS.
Telephone 2070. Telegrams—"BLINDS, LEEDS."

WRITE TO THE MANUFACTURERS.
BAYLISS, JONES & BAYLISS, LTD.
FENCING GATES, ETC.
WOLVERHAMPTON & LONDON.
LOW PRICES. CATALOGUES FREE. (NAME THIS JOURNAL.)

NOSTELL BRICK AND TILE WORKS,
MANUFACTURERS OF NR. WAKEFIELD.
TERRA COTTA in BUFF, RED, &c.
ROOFING AND FLOORING TILES.
Tel. Address: "WINN NOSTELL"
Tel. No. 66, WAKEFIELD.
Representative: FRANK TALBOT, West Leigh, Walton, near Wakefield.

CLARK & CO., 32a, Westminster Palace Gardens, S.W.
The Most Perfect Substitute for Keene's at almost the price of Lime
ONE material only required for both render and finish
A Perfectly Sanitary Fireproof Cement
PLASTER Telegrams: "CLARCOLITE, LONDON." Telephone: 5321 WESTMINSTER. Works: Newark-on-Trent, G.N.R.

FOLDING PARTITIONS. REVOLVING SHUTTERS.
Hartley Bros., 2/- ft. Super.
1/- ft. Super.
GORTON, MANCHESTER.

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork.

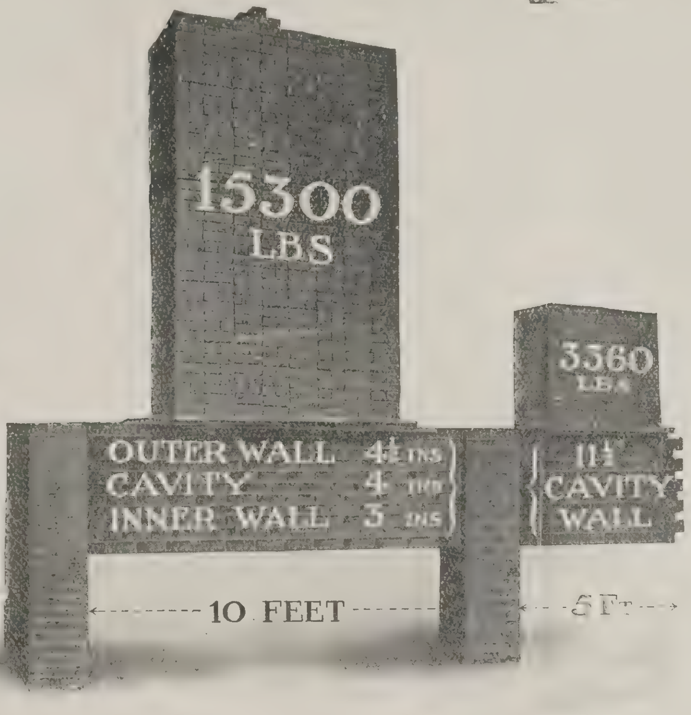
H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

RD. JOHNSON CLAPHAM, & MORRIS, Ltd.,



Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered
Soundproof,
Fireproof
Dampproof,

Architects, Builders, and Contractors

Write for Descriptive Catalogue.

Engineering Department,
24, Lever Street,
MANCHESTER.

Telegrams; "Metallicus, Manchester."

Hollow Wall and Cantilever constructed of 4½-in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

Telephone: 6437 Manchester.

The BUTTERMERE GREEN SLATE CO., LTD.

KESWICK, Cumberland.

Supply the finest *Cumberland & Westmorland GREEN SLATES* from their Celebrated—

Honister and Yew Crags Quarries, Cumberland.
Original Elterwater Green Quarries, Elterwater.
Coniston Green Slate Quarries, Tilberthwaite.
Lingmoor Quarries and Highfellside Quarries.

in the following colours:—

LIGHT SEA GREEN,
DARK SEA GREEN,
OLIVE GREEN,

and other Shades.

WESTMORLAND GREEN SLATES.

Manufacturers of Green Stonework for Flooring Tiles, Flagging, Heads, Sills, Mullions, Steps, Memorials, and other Architectural specifications.

Write for Prices, Samples and other particulars with List of Roofs covered to

Head Office—
KESWICK,
CUMBERLAND.

Telegrams—"Buttermere Slate, Keswick."

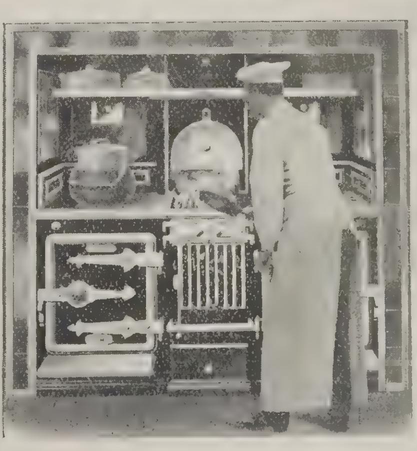
— or to —

52, QUEEN VICTORIA ST., LONDON, E.C.

Telegrams—"Khoro, London." Telephone—8206 Bank.

CARRON

Cooking Ranges



THE WORLD'S STANDARD FOR STYLE, STRENGTH AND SERVICE

Will help to build and maintain your reputation. They are the outcome of **150 years' experience** in range construction, and possess every possible improvement for the saving of fuel, time and labour.

CARRON COMPANY have received the highest award—
A Diploma for Grand Prix at the Franco-British Exhibition.

Write for No. 8 Range Catalogue.

CARRON COMPANY INCORPORATED BY ROYAL CHARTER 1773

CARRON, STIRLINGSHIRE.

(*Tenders continued from page vi.*)

Ashfordby (Leics.).—For Council school, for Leicestershire County Council Education Committee :—

J. R. Deacon	£4,695	0	0
W. Burnett	4,634	0	0
Hockley and Co.	4,566	0	0
C. E. Frisby	4,547	0	0
Griffin Bros.	4,436	0	0
W. Robinson	4,431	14	0
J. Cole and Sons	4,397	0	0
A. B. Moss	4,380	12	0
Scurr, Jowett and Co.	4,376	0	0
E. Haycock and Sons	4,340	0	0
E. Fox	4,325	0	0
E. Clarke	4,262	0	0
T. and H. Denman	4,170	0	0
W. Corah and Son,* Loughborough	4,123	0	0

*Accepted.

Hanley (Staffs.).—For erection of new shop premises, Market Square, Hanley, and for alterations to the existing premises, for Messrs. M. Huntbach and Co., Ltd. Messrs. R. Scrivener and Sons, architects, etc., Hanley :—

Tompkinson and Betteley	£3,391
C. Cornes and Son	3,317
W. Grant and Sons	3,315
G. Ellis	3,285
T. Godwin,* Hanley	3,037

*Accepted.

Bridlington.—For the erection of the Burlington Schools, for the Bridlington Education Committee :—

Dews and Co., Leeds	£9,679	17	6
F. Spink	9,579	5	0
W. Airey and Son, Leeds	9,550	0	0
Quibell, Son and Greenwood, Hull	9,500	0	0
E. Wilson	9,149	4	0
R. Musk and Son	8,995	0	0
Smallwood and Shaw	8,919	1	3
W. A. Storr	8,873	4	4
F. W. Martindale	8,870	0	0
C. Gant	8,741	19	7
Sampson and Tiddall	8,738	19	0
F. Postill	8,768	11	7
T. A. Moore*	8,615	10	0

*Accepted. Rest of Bridlington.

Trelewis (Glam.).—Accepted for addition to the Council School, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, architect, Cardiff :—

S. Shail, Llandaff	£1,155

Newbury.—For girls' school new buildings, for Berkshire Education Committee :—

Bosher and Sons	£10,558	12	4
Silver and Sons	9,994	0	0
Collier and Catley	9,699	0	0
Hoskings Bros.	9,400	0	0
A. J. Chivers	9,350	0	0
W. Creed	9,324	0	0
E. C. Hughes	9,095	0	0
H. Elms	9,009	0	0
G. Elms	8,989	15	6
C. W. Cox and Sons	8,988	0	0
Houghton and Hitchman	8,974	0	0
J. B. Steward,* Wokingham	8,928	0	0

*Accepted.

London.—For the erection of a police-station at Highbury Vale. Mr. J. Dixon Butler, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son and Chidgey, 8, Adelphi Terrace, Strand, W.C. :—

Dove Bros., Ltd.	£13,587
C. Ansell	13,500
Treasure and Son, Ltd.	13,351
Cubitt and Co.	12,950
Shurmur and Son, Ltd.	12,650
Higgs and Hill, Ltd.	12,430
Willmott and Sons	12,381
Leslie and Co., Ltd.	12,223
Mowlem and Co., Ltd.	11,990
McCormick and Son	11,987
Lovatt, Ltd.	11,967
F. and H. F. Higgs	11,927
Patman and Fotheringham	11,923
Prestige and Co., Ltd.	11,900
Godson and Sons	11,725
Sabey and Son, Ltd.	11,690

London.—For carrying out alterations and additions to the meeting hall of the West End Baptist Chapel, King Street, Hammersmith, W. Messrs. Gordon Wilson and Co., architects, 667, Fulham Road, S.W. :—

J. Myring and Co.	£1,475	0	0
C. Gray	1,280	18	2
S. Beaven	1,189	0	0
H. T. Bishop	1,168	0	0
G. H. Bailey	1,098	0	0
Dorey and Co.	1,079	0	0
A. J. Hicks	1,077	10	2
T. W. Acock	1,060	7	11
W. Lowe*	1,015	0	0

*Accepted.

Fenton.—For new infants' school, Manor Street, Fenton, for the Fenton Education Committee. Mr. S. B. Ashworth, architect, Old Bank Offices, Stoke-upon-Trent :—

J. Walters, jun.	£3,840	0	0
J. Grant	3,757	0	0
Young and Son	3,655	0	0
T. R. Yoxall	3,620	0	0
W. Mould	3,571	0	0
Tomkinson and Betteley	3,557	0	0
F. Godwin	3,541	0	0
S. Wilton, jun.	3,499	0	0
P. H. Bennion	3,459	5	0
Bennett Bros.	3,440	0	0
A. E. Chatfield	3,420	0	0
Ball and Robinson	3,400	0	0
H. Goodwin	3,390	0	0
C. Cornes and Son,* Hanley	3,195	0	0

*Accepted

Shinfield (Berks.).—For erection of a new school to accommodate 250 scholars at Hyde End, Shinfield, Berks., for the Berkshire Education Committee :—

Spear and King, Crowthorne	£4,076	0	0
Bosher and Sons, Cholsey	4,073	3	6
J. B. Steward, Wokingham	4,031	0	0
Hunt and Son, High Wycombe	3,961	0	0
H. Flint, High Wycombe	3,943	0	0
McC. E. Fitt, Reading	3,923	0	0
R. Love, Sunningdale	3,858	0	0
Caesar Bros., Hale, Farnham	3,844	16	0
H. W. Godwin, Reading	3,839	3	7
G. S. Lewis Bros., Reading	3,804	0	0
C. Aldridge,* Spencer's Wood	3,477	12	8

Extra for Tiled Dado.

C. Spear and King	128	0	0
Bosher and Sons	167	17	10
J. B. Steward	116	0	0
Hunt and Son	96	19	0
H. Flint	113	0	0
McC. E. Fitt	114	0	0
R. Love	125	0	0
Caesar Bros.	137	0	0
H. W. Godwin	103	0	0
E. C. Hughes	142	4	7
G. S. Lewis Bros.	115	0	0
C. Aldridge	94	5	4

*Accepted.

Tunbridge Wells.—For house and shop in St. John's Road, for Messrs. E. and H. Kelsey :—

Strange and Sons	£1,875
H. Roberts and Co.	1,780
J. Jarvis	1,765
Goodwin Bros.	1,735
Soper and Jones	1,685

LIFTS, CRANES, CRABS
REVOLVING SHUTTERS,
COLLAPSIBLE GATES,
SLIDING PARTITIONS.
DENNISON, KETT & CO.,
11, Queen Victoria Street, LONDON, E.C.
Iron Staircases, Doors and Sashes.
CATALOGUE FREE ON APPLICATION.
Telegrams: "Hoisters, London." Telephone, Bank 8356. A B C Code.

Reduce your Wages by using
BROOM & WADE'S
PATENT HOIST.
This is the most Efficient Hoist on the market for hoisting barrows of bricks, concrete, &c., without Gearing.
BROOM & WADE, LTD.,
Engineers, HIGH WYCOMBE.

FIREPROOF
A Word to conjure with
TUTAPORT
T U T A P O R T
REGISTERED TRADE MARK
Tr. Mk. No 303049 Patent No 14117.
TUTAPORT DOOR
Unique in Every detail.
Thoroughly Reliable.
Answers its purpose.
Protects against Fire.
On scientific principles.
Right in price.
There you are.
The CHECKFIRE DOOR Co.,
2, Lonsdale Road,
Kilburn, N.W.

The "Centenary" Petrol Gas Turbine Generator,
For Supply to a City or a Cottage.
THE CENTENARY GAS CO., 11, QUEEN VICTORIA STREET, LONDON, E.C., and 109, Hope Street, Glasgow.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must contorm to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Jan. 22. STONEHAVEN, ABERDEEN. — Mason, carpenter, and slater works, in making alterations on the buildings, at Mill of Catterline, Stonehaven Station, for the Arbuthnott Estate. Plans, specifications, and general conditions of contract can be seen with the tenant, or Davidson and Garden, 12, Dee Street, Aberdeen, with whom offers have to be lodged by Jan. 22.

Jan. 22. DESS, Aberdeen.—Mason, carpenter and slater works to be carried out in connection with the restoration of farm offices at Mill of Dess. Plans, specifications, and general conditions of contract can be seen with the tenant, or Davidson and Garden, 12, Dee Street, Aberdeen, with whom offers have to be lodged by Jan. 22.

Jan. 22. POULTON.—Erection of new buildings in connection with the intended extension of refuse destructor, Gorsey Lane, Poulton, for the health committee of the Wallasey U.D.C., in accordance with plans, etc., prepared by W. H. Travers, A.M.Inst.C.E., district engineer and surveyor, public offices, Egremont, Cheshire. Plans, etc., may be seen, and specification, etc., obtained, at the district engineer's office, on payment of £2.

Jan. 23. ABERDARE.—Erection of 28 workmen's dwellings at Cwmbach, also 22 at Godreaman, for the U.D.C. Plans and specifications may be inspected at the surveyor's office, town hall, Aberdare, between 10 a.m. and 5 p.m., Saturdays 10 a.m. to 1 p.m. Tenders, endorsed "Workmen's Dwellings," are to be delivered by Jan. 23, to Thos. Phillips, clerk, town hall, Aberdare.

Jan. 23. PENKRIDGE (near Stafford).—Erection and completion of a new Council school for about 150 children, and also a cookery room at Penkridge (near Stafford), for the Education Committee. Builders desirous of tendering should apply by January 23, to Graham Balfour, director of education, county education offices, Stafford. Quantities will be supplied on deposit of £1 1s., which should accompany the application to tender.

Jan. 23. MANCHESTER.—Erection of the new municipal secondary school for girls in Chorlton Street, for the Education Committee. Plans may be seen and a copy of the bills of quantities (including specification) obtained at the elementary education office, Deansgate, Manchester, on deposit of three guineas (cheques to be made payable to the accountant). Tenders on the forms provided, addressed to "The Chairman of the Education Committee," must be delivered at the school of technology before noon on Jan. 23.

Jan. 23. FAIRMILE, CHRISTCHURCH.—Erectoin of an infirmary at the workhouse, Fairmile, Christchurch, for the guardians of Christchurch Union. Full particulars, with plans, specifications, and conditions, and a copy of the contract, may be seen at the board room at the workhouse. Persons desirous of tendering may obtain copies of the bills of quantities and forms of tender of the clerk. Tenders, with the names and addresses of sureties proposed, and references as to their sufficiency, with the priced bills of quantities in sealed envelopes, provided, must be delivered by noon on Jan. 29, to A. Druitt, clerk to the guardians. A deposit of £5 is required.

Jan. 25. LITHERLAND.—Erection of a cookery and laundry centre at Lander Road Council School, Litherland, near Liverpool, for the Lancashire Education Committee. Plans may be seen and bills of quantities obtained, at the office of the county architect, Henry Littler, 16, Ribblesdale Place, Preston, by deposit of £2.

Jan. 25. SACRISTON.—Erection and completion of new workmen's club at Sacriston, co. Durham, for the committee of Sacriston workmen's club. Drawings, etc., and conditions of contract may be seen, and forms of tender obtained at the architect's office, 22, Durham Road, Blackhill, co. Durham.

Jan. 25. OMAGH (Co. Tyrone).—Erection of new bank premises at Omagh, County Tyrone, for the directors of the Ulster Bank, Limited. Plans and specification may be seen at the office of the architects. Schedules of quantities may be obtained from W. H. Stephens and Sons, 13, Donegall Square North, Belfast, on deposit of two guineas. Sealed and endorsed tenders to be lodged before 10 a.m. on Jan. 25, with Blackwood and Jury, Ms.R.I.A.I., architects, 41, Donegall Place, Belfast.

Jan. 26. DUKESTOWN, Tredegar.—Erection of a new church at Dukestown, Tredegar. Plans and specifications may be seen at the office of the architect, A. F. Webb, High Street, Blackwood. All tenders to be sent to the architect by Jan. 26.

Jan. 26. BOLGOED, Pontardulais.—Erection of a large villa residence, Bolgoed, Pontardulais. Full particulars may be had from W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff. Plans and specification may also be seen at Pontardulais. Tenders to be delivered by Jan. 26.

Jan. 26. BELFAST.—Erection of an addition to the municipal technical institute, for the corporation. Drawings, etc., may be seen, and schedule of quantities (prepared by S. C. Hunter) and form of tender can be obtained at the office of the architect, Samuel Stevenson, 83, Royal Avenue, Belfast, on payment of £2 2s.

Jan. 26. WIGAN.—Erection of 50 cottages on land adjoining the car sheds, Melverley Street, for the corporation. Plans, sections, specifications, etc., and any other particulars may be obtained on application at the office of the borough engineer, King Street West, Wigan. Sealed tenders, endorsed "Tramway Cottages," must be delivered by 10 a.m. on Jan. 26, to Harold Jevons, town clerk, town clerk's office, Wigan.

Jan. 26. BELFAST.—Erection of an addition to the municipal technical institute, for the Corporation. Drawings and specifications may be seen, and schedule of quantities (prepared by S. C. Hunter), and form of tender, obtained at the office of the architect, Samuel Stevenson, 83, Royal Avenue, Belfast, on payment of two guineas. Tenders, endorsed "Tender for the Erection of the Addition to the Municipal Technical Institute," to be delivered by 11 a.m. on Jan. 26, to Samuel Black, town clerk.

Jan. 27....OTFORD, Sevenoaks.—Execution of certain works at the North Isolation Hospital at Otford, including repairing and re-erection of various temporary buildings, the conversion of one into a discharging block, tar paving and repairs to the hospital, for the R.D.C. Drawings and specifications may be inspected and forms of tender obtained at the office of the clerk. Tenders must be on forms supplied and delivered, sealed and endorsed "Tender for Hospital Work," by Jan. 27, to George F. Carnell, clerk of the council, 130, High Street, Sevenoaks.

Jan. 27. REDNAL.—Erection of a public reading room at Rednal, for the King's Norton and Northfield U.D.C. Bills of quantities and forms of tender may be obtained upon application to the engineer and surveyor to the council, Ambrose W. Cross, A.M.I.C.E., 23, Valentine Road, King's Heath, on deposit of one guinea. Applications for the bills of quantities and forms of tender must be received by Jan. 21, and sealed tenders, endorsed "Tender for Erection of Public Reading Room at Rednal," must reach Edwin Docker, clerk to the council, 10, Newhall Street, Birmingham, by noon on Jan. 27.

Jan. 28. HAMBLEDON, SURREY.—Alterations and additions to an old building in order to provide additional accommodation for aged women at the union workhouse, Hambledon, Surrey, for the board of guardians. Plans and specification of the proposed work can be seen on application to the board's architect, Edward L. Lunn, 36, High Street, Guildford. Sealed and endorsed tenders are to be sent by 9.30 a.m. on Jan. 28, to Ferdinand Smallpeice, clerk to the guardians, 138, High Street, Guildford.

Jan. 29. LONDON, S.W.—Removing the plaster from the ceilings of the men's and women's swimming baths in Manor Street, and substituting therefor 7-8th in. yellow deal or pitch-pine matchboarding for the Metropolitan B.C. of Chelsea, in accordance with the specification, which may be seen at the office of T. Holland, town clerk, town hall, King's Road, Chelsea, S.W., between the hours of 10 and 5 daily (Saturdays 10 to 1). Persons tendering must state separately in their tenders the difference in the cost of the work if carried out in pitch-pine instead of yellow deal. Tenders to be delivered in sealed envelopes, endorsed "Tender for repairs, Public Baths," at the town clerk's office, at the town hall, not later than noon on Jan. 29.

Jan. 30. YORK.—Construction of a temporary timber grand stand (to seat about 5,000 persons) in the gardens of the Yorkshire Philosophical Society, at York, for the Executive Committee of the York Historic Pageant. Drawings may be seen and specifications and quantities obtained from F. W. Spurr, city engineer, Guildhall, Yorks., to whom sealed tenders, endorsed "Grand Stand," must be delivered by Jan. 30. Two guineas to be deposited for specification and quantities.

Feb. 1. CRICKLEWOOD.—Construction of coal bays, fitting and other workshops, stores, lodge, cottages, etc., at Cricklewood, and cottages, etc., at Kempton Park, in the county of Middlesex, for the Metropolitan Water Board. Forms of tender, conditions of contract, specification and bills of quantities may be obtained from the engineer, Staines Reservoirs Communication Works, The Firs, Southern Road, Fortis Green, East Finchley, N., on the production of an official receipt for the sum of £10, deposited with the accountant to the board, Savoy Court, Strand, W.C. Such payments and applications can be made any week day (except Thursdays and Saturdays) between 10 a.m. and 4 p.m. Tenders, addressed to the clerk, Metropolitan Water Board, Savoy Court, Strand, W.C., and endorsed "Tender for Coal Bays, etc., Cricklewood and Kempton Park," must be delivered in sealed envelopes at the offices of the Board, by 10 a.m. on Feb. 1.

Feb. 1. TIDWORTH.—Erection of army ordnance receiving shed, general stores, offices, etc., also clothing, camp and mobilisation stores, at Tidworth. Plans, specification and conditions of contract may be inspected at the office of the director of barrack construction, 80, Pall Mall, London, S.W., or at the barrack construction office, Tidworth, on Jan. 20. Those desiring to tender and to receive a copy of the bills of quantities, must apply to the director of barrack construction not later than Jan. 22. The application must be accompanied by a deposit of 10s. Cheques or orders to be made payable to the assistant financial secretary, and crossed "Bank of England for Credit to Army Funds." Tenders, on the form supplied with the bills of quantities, must be delivered in sealed envelopes, marked "Tender for A.O.D. Stores, etc., Tidworth," not later than 12 noon on Feb. 1, addressed to the director of Army Contracts, War Office, Whitehall, London, S.W. The bills of quantities should accompany tender in a separate sealed envelope, similarly addressed, and marked "Bills of Quantities, A.O.D. Stores, Tidworth," with the contractor's name and address thereon.

Feb. 2. LOWESTOFT.—Enlargement of Lowestoft post-office, for the Commissioners of H.M. Works and Public Buildings. Drawings, specifications, and a copy of the conditions and form of contract may be seen on application to the postmaster. Bills of quantities and forms of tender may be obtained at H.M. Office of Works, Storey's Gate, London, S.W., on payment of £1 1s. Tenders must be delivered before noon on Feb. 2, to the secretary, H.M. Office of Works, etc. Storey's Gate, London, S.W., and endorsed "Tender for Lowestoft Post-Office Enlargement."

Feb. 3. BARNSLEY.—Additions to the Barnsley Post Office, for the Commissioners of H.M. Office of Works and Public Buildings. Drawings, specification, and a copy of the conditions and form of contract, may be seen on application to the postmaster between the hours of 10 a.m. and 4 p.m. Bills of quantities and forms of tender may be obtained at the under-mentioned address on payment of £1 1s. Tenders must be delivered before 12 o'clock noon on Feb. 3, addressed to the secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., and endorsed "Tender for Barnsley Post-Office Additions."

Feb. 3. LAINDON, Essex.—Erecting iron buildings and making additions and alterations to existing buildings, and other works at the Laindon branch workhouse, Essex, for the Poplar Borough Board of Guardians, in accordance with drawings and specification prepared by the architects, J. and W. Clarkson, 136, High Street, Poplar, E. Drawings and conditions of contract may be seen at the offices of the architects and copy of the specification and form of tender obtained upon deposit to the architects of three guineas. Persons desirous of tendering must send their names to the architects by Jan. 25. Tenders, sealed and endorsed "Tender for Additions and Alterations at the Laindon Branch Workhouse," must be delivered by 6.30 p.m. on Feb. 3, to G. Herbert Lough, clerk to the guardians, 45, Upper North Street, Poplar, London, E. The successful contractor will be required to only employ the men whose names are on a list which will be supplied to him from time to time by the Poplar distress committee, or the Poplar employment exchange. The contractor is at liberty to choose and employ a foreman independently. Fair wages clause. Two sureties required.

Feb. 3. PONTYPRIDD.—Erection of a new building in accordance with drawings and specification prepared by the architect, Vernon Hodge, London, for the building committee of the Pontypridd Y.M.C.A. Drawings, specification, and conditions of contract may be inspected at the present Y.M.C.A. rooms on the site, Taff Street, Pontypridd, on and after ten a.m. on Jan. 21. Copies of the quantities (prepared by the surveyors, C. Pearson Shaw, Son, and Hemingway, Nottingham) can be obtained from the secretary upon deposit of two guineas. Sealed and endorsed tenders, on forms supplied, must be received by Geo. W. Rankin, new buildings secretary, "Bronheulog," Church Place, Penarth, Glam., by noon on Feb. 3.

Feb. 6. TONYREFAIL.—Erection of 60 houses and 6 shops on the Pnysyplwm estate, Tonyrefail, for the Ty'ynycoed building club. Plans and specifications can be seen with Philip J. Jones, architect, Cilfynydd, Pontypridd, and Tonyrefail. Sealed and endorsed tenders to be sent to David Jones, secretary to the Ty'ynycoed Club, Handel House, Cilfynydd, Pontypridd, by Feb. 6.

Feb. 8. PENDLETON.—Erection of a school to accommodate about 388 boys in Wellington Street, Pendleton, for the Salford C.B. Education Committee. Builders desirous of tendering must send in applications for quantities on or before Jan. 20, accompanied by a deposit of £1 1s., to J. B. Broadbent, A.R.I.B.A., architect, 15, Cooper Street, Manchester, at whose office the plans may be seen. Sealed tenders, endorsed "Tender for Wellington Street Boys' School," and addressed to the chairman of the education committee, must be delivered to L. C. Evans, town clerk, town hall, Salford, not later than noon on Feb. 8.

Feb. 8. ARMATHWAITE.—Erection and completion of a mixed school and master's house at Armathwaite, for the Cumberland Education Committee. Contractors desirous of tendering for the whole or any of the several trades are requested to submit names, stating trades, upon deposit of one guinea for a full set of quantities, or half-a-guinea for each separate trade. Quantities and all particulars for tendering will be supplied. Tenders to be delivered to C. Courtenay Hodgson, The Courts, Carlisle, by 10 a.m. on Feb. 8.

Feb. 9. WALTHAMSTOW. — Erection of the proposed higher elementary school (boys' and girls' department) on the Greenleaf Road site, for the Education Committee. Builders desirous of tendering are invited to send their names to H. Prosser, M.S.A., architect to the committee. Drawings and specifications can be seen on and after Jan. 26, between 10 a.m. and 4 p.m. (Saturdays 10 to 12). Applications for bills of quantities must be sent to the architect by 5 p.m. on Jan. 22. A £5 note must be sent with the application as deposit for the bills of quantities. Tenders to be endorsed "Higher Elementary School," addressed to T. W. Liddiard, secretary to the committee, offices, High Street, Walthamstow, and delivered (through the post only), by 3 p.m. on Feb. 9.

ENGINEERING.

Jan. 25. KIDSGROVE.—Supplying and fixing engine, boiler, and pumping plant, for the waterworks at Mow Cop, for the U.D.C.. Further particulars can be obtained from the council's surveyor, F. C. Crimes, Kidsgrove. Tenders to be sent endorsed "Tender for Engine, etc.," by Jan. 25, to John J. Nelson, clerk to the council, Kidsgrove.

Jan. 25. ASTON MANOR.—Fixing of an air compressor, water and air pipes, at the public baths, Victoria Road, Aston Manor, for the Corporation. Bills of quantities and all information can be obtained from F. W. Richardson, borough engineer and surveyor, council house, Aston Manor, on payment of one guinea. Sealed tenders, endorsed "Air Lift Plant," and addressed to the chairman of the baths sub-committee, must be delivered at the council house, Aston Manor, by Jan. 25. Fair wages clause.

Jan. 27-Feb. 6. ORMSIDE, East Westmoreland.—Erection of a bridge and retaining walls, and filling up and formation of road approaches, at Helm Beck, in the parish of Ormside, for the highways committee of the R.D.C. Plans and specifications may be seen at the office of John Kilner, surveyor, Kirkby Stephen, who will attend at the site of the proposed new bridge on Jan. 27, from 11 a.m. to 12 noon, and will give all necessary information. Sealed tenders, endorsed "Helm Beck Bridge," must be delivered at the office of Wm. Hewitson, Appleby, clerk to the council (where also plans and specifications may be seen), by noon on Feb. 6.

Jan. 28. LEWES.—Boring at the workhouse of the Lewes Union, in the parish of East Chiltington. Specifications and form of tender may be obtained on payment of two guineas, from W. Vaux Graham, M.Inst.C.E., 5, Queen Anne's Gate, Westminster, S.W. Tenders, marked "New Boring at the Workhouse," must be sent by first post on Jan. 28, to Charles Patrick, clerk to the guardians, Lewes, Sussex.

Jan. 28. EGG BUCKLAND.—Laying a 1-inch water main and constructing a tank in connection with a water supply at Riverford, in the parish of Egg Buckland, for the Plympton St. Mary R.D.C. Schedules and further particulars may be obtained on application to the council's engineer, F. A. Clark, 83, Old Town Street, Plymouth. Sealed tenders, marked "Riverford Water," must be sent by Jan. 28, to John W. Bickle, solicitor, Temple Chambers, Westwell Street, Plymouth.

Jan. 29. GLASGOW.—Construction of a steel footbridge, across the river Kelvin, within the botanic gardens, for the corporation. Plans, sections and detailed drawings may be seen and specifications and forms of tender obtained on application to the city engineer, city chambers, 64, Cochrane Street. Sealed offers, marked outside "Tender for Steel Bridge, Botanic Gardens," must be lodged by 10 a.m. on Jan. 29, to A. W. Myles, town clerk, City Chambers, Glasgow.

Feb. 1. MIDDLESBROUGH.—Construction of a footbridge over the railway at Cargo Fleet Road crossing, Middlesbrough, for the directors of the North-Eastern Railway. The work comprises about three tons of new steelwork, altering and erecting a pair of girders to be provided by the company, weight about 9 tons, masonry piers and timber steps. Plan and specification may be seen, and detailed quantities and form of tender obtained, on personal application at the office of W. J. Cudworth, the company's engineer, at York. Sealed tenders, marked "Tender for Footbridge at Cargo Fleet Road Crossing, Middlesbrough," must be sent by 9 a.m. on Feb. 1, to R. F. Dunnell, secretary, York.

Feb. 1. WILMINGTON.—Construction and erection of a footbridge over the Hull and Hornsea branch, near Wilmington, for the directors of the North-Eastern Railway. The work comprises about three-and-a-half tons of new steelwork, brick piers, and timber steps. Plan and specification may be seen, and detailed quantities and form of tender obtained, on personal application at the office of W. J. Cudworth, the company's engineer at York. Sealed tenders, marked "Tender for Footbridge over Hull and Hornsea Branch near Wilmington," must be sent by 9 a.m. on Feb. 1, to R. F. Dunnell, secretary, York.

Feb. 4. WOODFOOT, DUMFRIES.—Taking down the existing timber bridge over the river Annan, at Woodfoot, about two miles from Beattock Station, and supplying and erecting a new steel girder bridge of three spans, for the Lockerbie District Committee. Plans may be seen at the office of the engineers, Crouch and Hogg, C.E., 14, Blythswood Square, Glasgow, from whom copies of the specification, schedule of quantities, and form of tender may be obtained on payment of one guinea. Sealed tenders, marked "Woodfoot Bridge," must be lodged by 10 a.m. on Feb. 4, to John F. Cormack, district clerk, Lockerbie District Committee.

IRON AND STEEL.

Jan. 21. LONDON (for Assam).—Supplying steel rails and fishplates, for the Assam-Bengal Railway Co. Specification and tender forms may be obtained from the offices of the Company, Bishopsgate House, 56, Bishopsgate Street Within, London, E.C. A fee of one guinea is charged for each specification, which cannot be returned. Tenders must be delivered at the company's offices by noon on Jan. 21, to F. A. Lyall, secretary.

Jan. 21. PLYMOUTH. — Supplying for the period of one year:—Fire hydrants, lead pipe and pig lead, stopcocks, ferrules, etc., cast-iron work, sluice valves, for the Corporation. Particulars and forms of tender can be obtained at the office of the water engineer. Tenders enclosed in envelopes provided to be delivered by noon on Jan. 21, to Frank Howarth, M.Inst.C.E., water engineer, municipal buildings, Plymouth.

Jan. 22. ROTHERHAM.—Supply and delivery of cast-iron pipes and irregularly-shaped pipes and castings, as may be required during the year ending December 31, 1909, for the Corporation. Specifications, forms of tender and drawings may be obtained at the office of Ernest B. Martin, A.M.I.C.E., waterworks engineer, town hall, Rotherham, on deposit of £1 1s. Tenders, endorsed "Tenders for Cast-Iron Pipes," must be forwarded by 10 a.m. on Jan. 22, to W. J. Board, town clerk, town hall, Rotherham.

Jan. 23. SWINTON AND PENDLEBURY. — Supply and erection of swings, and the supply and erection of wrought-iron fencing at the Moorside recreation ground within the district, for the U.D.C. Plan may be seen and specification and forms of tenders obtained on application to Henry Entwistle, council offices, Swinton, Manchester, between 9.30 and 11 o'clock a.m., on deposit of a cheque for 10s. 6d., payable to W. T. Postlethwaite, clerk to the council, council offices, Swinton, Manchester. Sealed tenders to be returned in envelopes provided by Jan. 23.

Jan. 23. SOWERBY BRIDGE.—Supplying 20 tons of 6 in. cast iron spigot and socket pipes, tested, coated and delivered at Sowerby Bridge, as required for the U.D.C. Specification, forms of tender and any other information can be obtained on application to John Hopkinson, waterworks engineer, at his office, Town Buildings, Sowerby Bridge, up to Jan. 20, between 9 a.m. and 10 a.m. Sealed tenders, endorsed "Tender for Water Pipes," to be delivered by Jan. 23, to R. W. Evans, Commercial solicitor and clerk to the council, Commercial Bank Chambers, Halifax. (See also "Miscellaneous.")

Jan. 26. YNYSCYNHAIARN. — Supplying (1) about 150 tons 3in. to 8in. cast or steel gas main and fittings; (2) about 90 lanterns and incandescent burners. Specifications and forms of tender can be obtained from Jno. Jones, clerk to the council, town hall, Portmadoc, on payment of £1 1s. for each copy. Tenders, endorsed "Tender for ——," to be delivered by Jan. 26.

Feb. 1. NEATH.—Supplying cast-iron pipes of 18 in., 16 in., and 15 in. diameter respectively, with special castings, of similar sizes, valves, and fittings, for the waterworks committee of the R.D.C., to be delivered to Hirwain Station consigned to Ystradfellte Waterworks. Detail drawings, specification, schedule of quantities, and form of tender may be obtained upon application to D. M. Davies, engineer, council offices, Neath, upon receipt of cheque for three guineas. Sealed tenders, endorsed "Tenders for Pipes, Valves, etc., Ystradfellte Waterworks," must be addressed to the chairman of the waterworks committee, and delivered by Feb. 1, to Cuthbertson and Powell, clerks to the council, 58, Water Street, Neath.

PAINTING.

Jan. 25. ASTON MANOR.—Painting, and decorating the public swimming baths, Victoria Road, Aston Manor, for the corporation. Specification and all information can be obtained from F. W. Richardson, borough engineer and surveyor, council house, Aston Manor, on payment of one guinea. Sealed tenders, endorsed "Baths Painting," and addressed to the chairman of the baths sub-committee, must be delivered at the council house, Aston Manor, by noon on Jan. 25. Fair wages clause.

PLUMBING & SANITARY

Jan. 21. TYNEMOUTH.—Laying about 2,000 yds. of 9 and 12 inch pipe sewers, together with the construction of necesssary manholes, etc., flush tank, and outfall arrangements, at Bigges Main, near Long Benton, for the Tynemouth R.D.C. Plans and specifications may be seen at the office of A. S. Dinning, 21, Ellison Place, Newcastle. Tenders, sealed and endorsed "Bigges Main Sewers," to be sent by noon on Jan. 21, to A. Whitehorn, clerk to the R.D.C., 60, Saville Street, North Shields.

Jan. 22. MANCHESTER.—Execution of the work named in the undermentioned streets, for the paving, sewering and highways committee: Sewering, draining, paving, etc., Buckley Street, from Fairfield Road to Edward Street, and from Rock Street to Wheler Street, Openshaw. Sewering and part draining Cooper Street, from Schofield Street to Fargher Street, Clayton. Draining, paving and flagging Birch Hall Lane, from Dickenson Road to a point 122 yards distant in a south-westerly direction, Rusholme. Forms of tender may be obtained on application to the paving, etc. department (surveyor's office), and must be returned to the chief clerk, paving, etc. department, town hall, Manchester, by 10 a.m. on Jan. 22.

Jan. 27. HAMPSTEAD HEATH, N.W.—Supply and delivery of agricultural drain-pipes at Hampstead Heath, for the L.C.C. Persons desiring to submit tenders may obtain the specification, form of tender, and other particulars at the Parks Department, 11, Regent Street, S.W. Tenders must be upon the official forms, and the printed instructions contained therein must be strictly complied with. Fair wages clause. Each tender is to be delivered at the County Hall, in a sealed cover, addressed to the Clerk of the London County Council, Spring Gardens, S.W., and marked "Tender for drain pipes, Hampstead Heath." No tender received after eleven a.m. on Jan. 27 will be considered.

Jan. 27. LLANTRISANT AND LLANTWIT FARDRE.—Execution of the following works, for the R.D.C. (a) For widening and improving a portion of the district road between Efail Isaf and Pont Lydan, including excavations, filing, forming, banking, and fencing, ballasting, metalling, etc. Length about 57 lineal yds. (b) Widening and improving a portion of the district road between the electric power station and upper boat bridge, including excavations, filling, forming, banking and wire fencing, ballasting, metalling, etc. Length about 390 lineal yds. (c) Sewer extension at Trebanog, including the provision and laying of about 110 lineal yds. of 6 in. dia. stoneware pipes, the construction of manholes, and other incidental works. (d) Construction of sewerage and sewage disposal works for the village of Efail Isaf. The sewerage works include the provision and laying of about 250 lineal yds. of 9 in. dia. and 1,395 lineal yds. of 6 in. dia. stoneware and cast iron pipes, together with the construction and erection of all manholes, lampholes, ventilating columns, etc. The sewage disposal works consist of the construction of grit chamber, feed, septic and measuring tanks, percolating filter, and effluent irrigation drains and effluent outlet chambers. Specifications may be seen, and bills of quantities and forms of tender obtained from Gomer S. Morgan, surveyor, School Street, Pontyclun, upon deposit of £1 for each contract. Sealed tenders must be deposited at the office of the clerk to the council, W. Spickett, solicitor, Pontypridd, before 10 a.m. on Jan. 27.

January 27, 1909 Volume 29. No. 4.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: A British School of Architecture in Italy; Psychological Phenomena; Architectural Gardening - - - - - - - 67
Architectural Societies - - - - - - - 69
Proposed New Works - - - - - - - 70
Our Plate - - - - - - - - - 70
Works in Progress and Completed - - - 71
Architectural Treatment of Reinforced Concrete. By John H. Markham, A.R.I.B.A. - 72
The Common-sense Use of Materials - - 75
Notes on Competitions: Carnegie Library, New Mills; Tynemouth Palace Competition; Concerning Competitions; Berkshire County Council Offices, Reading; New Schools, Ilkeston - - - - - - - 76
The Function of Colour in Street Architecture. By P. M. Stratton, A.R.I.B.A. - - 77
Enquiries Answered - - - 78
Trade and Craft - - - - - - - - 83
Matters of Opinion: The Increased Employment of Specialist Contractors - - - - 83
Federation Notes - - - - - - - 84
Tenders - - - - - - - - vi., viii.
Coming Events - - - - - - - viii.
Insurance - - - - - - - - viii.
Complete List of Contracts - - - xviii.-xx.

ILLUSTRATIONS.

Girls' New High School, Gloucester (Walter B. Wood, A.R.I.B.A., Architect): Main Corridor, 69; The Assembly Hall, 71; Second Floor Plan, 72; First Floor and Ground Floor Plans, 73; see also Centre Plate.
Design for Braced Collar-beam Roof - - 78
Walls for Swimming Pond - - - - - 79

A British School of Architecture in Italy.

In the opening address delivered by the President of the R.I.B.A. in November last, reference was made to the desirability of enabling art students of this country to join a school, at Rome or elsewhere in Italy, in which "young painters, sculptors, and architects could fraternise, help one another, and receive some guiding direction in the profitable study of great works." So far as the interests of the art of architecture in this country are concerned, nought but good could result from the formation of a school of the nature indicated, provided the course of study were placed under the control of a thoroughly suitable man. But nothing short of the adoption of the methodical and systematic course of training to be obtained at the Beaux Arts in Paris will suffice to meet the growing wants of the large number of English students who are now devoting their time and energy to the acquisition of knowledge connected with an art which is, at the present time, all but a lost one. Unfortunately, owing entirely to their lack of efficient training, few architects of to-day are able to realise how supremely important it is to the welfare of the profession in general that our students of architecture should be afforded the means of obtaining a course of artistic study as thorough and definite in its characteristics and aims as that enjoyed by young architects in other countries. Were it otherwise, a National College of Architecture, subsidised by and encouraged by the Government, would long ago have been founded, with the object of enabling English architects to become thorough masters of their art. So-called "schools of architecture" (in which young men may obtain a sufficient knowledge of building construction and the elements of design to enable them to earn a more or less precarious livelihood in the subsequent practice of architecture) abound in profusion, but it is, to say the least, extremely doubtful whether they do much, or are intended to do much, for the advancement of the *art*. Indeed, in our judgment, the utility of many of the existing educational centres may be gauged by the fact that they sometimes succeed in imparting to the shrewd man of affairs that modicum of architectural learning and architectural skill which is often, in these days, sufficient to enable him to acquire a profitable architectural practice in which *architecture* usually plays a very subordinate part. The ideal school of architecture would be one conducted under the auspices of the architects in *actual practice*, whose experience and artistic attainments are of a nature to entitle them to speak with authority on what Mr. Blomfield calls "The Mistress Art." That these directors of architectural education should themselves be in all cases sufficiently well trained in the essentials of their profession to enable them to inculcate, in the minds of students, the *true* principles of the art of design—including the fundamental rules of monumental planning and a due appreciation of the value of proportion, symmetry and refinement—goes without saying, for otherwise they would prove unsafe guides for the embryo architects whose artistic education they may be called upon to direct and control. We look forward with a considerable amount of interest to the day when the Council of the Royal Institute of British Architects will be in a position to give reality to a suggestion which, *prima facie*, appears to us to be one of great value to the cause of architectural education in this country.

Psychological Phenomena.

Haunted houses are only too common; and, given an historical mansion, a properly constituted ghost is a valuable asset when the property comes into the market. The wealthy parvenu purchaser—especially if he comes from the other side of the Atlantic—expects that the upset price will include the family ghost, if not the family ancestors. But a ghost in an architect's office is "not so estimable, profitable neither," especially when it begins to play pranks with the goods and chattels; and some such supernatural agency is perhaps intended to be inferred from the circumstances recorded in the following paragraph, which appears in a Manchester newspaper: "[Blanktown] police have a rather curious matter in hand. The staff in a local architect's office is considerably puzzled by the fact that on several occasions the furniture and other things have been piled in a heap in the centre of one of the rooms during the night. A special watch was kept, but the same thing occurred." Motives of delicacy have prompted us to disguise the name of the town. Not but what such things are likely to occur in the best-regulated office; and where the staff is large, the opportunities for mischief and the chances of the "spook" escaping detection are greatly multiplied. The architect—of whose identity we have not the remotest idea—was doubtless wise in appealing to the police rather than to the Psychical Research Society. A spook whereof we had experience in our salad days showed almost diabolical and quite inexhaustible ingenuity in varying the means of annoying everybody in the office. One day the red ink would be emptied into the gum-pot; the next, this interesting but unhelpful process would be exactly reversed. Another time, every office coat would have its sleeves stitched up. Anon, numberless carefully-assorted documents would be hopelessly mixed and disarranged, driving everybody to distraction. This kind of thing went on for years, until the most grave and sedate of the senior assistants, who was always conspicuously one of the chief sufferers from these booby tricks, left the office to start on his own account. Then the annoyance suddenly and completely ceased. It is seldom or never the youth of irrepressible high spirits who practices these despicable subtleties. In houses where the crockery jumps and rattles without visible human agency, chains clank, and doors fly open, the "spook" is often discovered in the most demure, timorous, and least suspected member of the household—some "smug" with a mean and morbid passion for slyness and mystification. That is the kind of youth who should be most closely watched when similar manifestations occur in an architect's office. But the statement that "a special watch was kept, but the same thing occurred," does not increase the credibility of the paragraph.

Architectural Gardening.

The other day, Mr. Joseph Cheal, of Crawley, delivered, at a meeting of the Italian Circle of the Lyceum Club, a fascinating lecture on "The Old Gardens of Italy." He showed that the Italian love of gardening is traditional. Roman generals brought home glowing accounts of the gardens of Assyria, Babylonia, and Egypt, and it was their accounts, probably, that fired the emulation of Lucullus, whose magnificent garden at Naples is described by Pompey. Early in the second century, the Emperor Hadrian showed a nice taste in horticulture; and Pliny the Younger, at about the same period, not only designed gardens, but left descriptions of them. Lorenzo de Medici did much in the creation of beautiful villas and gardens round Rome and Florence; and, at the Renaissance, senators and church dignitaries vied with each other in the making of gardens, many of which have survived to the present time. Gardening, it may be added, has been cultivated from the most ancient times in India and China. It was, of course, the Romans who introduced gardening into Britain. On their retirement it fell into decay, and was revived by the monks. Later, the laying out of the monastic grounds was imitated around the principal castles; and it may be supposed that these early gardens, with their arbours, fountains, trim hedges, and grassy seats, were not wholly deficient in architectural character. About the fifteenth century, it was customary to introduce raised mounds, which were sometimes elaborately constructed of stone or brick. By the seventeenth century, pleasure-gardening had reached a high level of cultivation; but the formal gardening that had been prevalent up to the time of Queen Anne was ridiculed by the wits—Pope and Addison, for instance—and was superseded by the landscape gardening of which Bridgeman, Kent, Batty Langley, and "Capability" Brown became notable exponents, when stately avenues and terraces were abolished in favour of a rather ridiculous so-called "imitation of nature." Even sham ruins were erected by disciples of this school. The most notorious example of the gardener turned architect is, of course, that huge conservatory the Crystal Palace; but this, after all, is but an inconsiderable revenge for the innumerable instances in which architects have devised gardens. The general lay-out and the structural features are surely well within the province of architects, who, to judge from sundry indications, are beginning to pay increasing attention to the subject. Not long ago, an entire issue of one of the American architectural magazines was devoted to architectural gardening; and one or two English architects are delivering lectures on the subject. The spread of the garden city movement has probably given an impetus in this direction; and it seems to us to be perfectly obvious that, the garden being an adjunct to the building, the architect is indisputably the proper person to plan it, and that he can do this without in any degree trespassing on the functions of the gardener, who, in these days, has become a very respectably scientific specialist in his own line, and who, to his credit, usually recognises that all that pertains to architecture should be left to the architect.

* * *

Leeds Workhouse Extension—A Knotty Question. The Leeds Guardians have had a rather difficult problem to solve. They are about to build a new workhouse block, and their workhouse committee recommended that, as the late Mr. Thomas Winn had conceived the extension scheme, the work should be given to his firm. To this proposition an amendment was moved, to the effect that competitive plans should be invited. To this amendment it was objected that the Guardians were under a moral obligation to give the work to Mr. Winn's firm, and that, since the Board knew exactly what was required, it would be a waste of effort to invite competitive plans—that, in fact, Messrs. Winn's sons, having been in touch with the scheme from its inception, and having been already consulted with respect to the ground plan, were in the best possible position to meet the requirements of the Board of Guardians and of the Local Government Board. These were strong arguments, but they did not prevail. The opponents of the proposition admitted that the firm in question had always done their work exceedingly well, and that there was nothing to be said against them; but some of the Guardians thought that the Board's work ought to be distributed—that other architects ought not to be excluded from a chance of doing the work. One speaker said that he would like the Board to follow the example set by the Government when they wanted to extend the British Museum. For that work the R.I.B.A. were invited to submit the names of half-a-dozen architects. Could not the Board follow this example, and ask the Leeds Architectural Society to submit six names? This suggestion was ridiculed. "Why should not the Board make its own appointments?" The answer to this naïve question would be more easy than complimentary; but it may perhaps be asked, without offence, "If the Government did not disdain expert advice, why should the Leeds Board of Guardians show less modesty?" In the end, it was decided by fifteen votes to nine, that local architects who were desirous of doing the work should be invited to send in their names. Taking all the circumstances into consideration, so far as they are revealed in the newspaper report upon which we are dependent for the particulars that are here impartially summarised, this decision seems to bear somewhat hardly on the firm that had apparently been led to entertain a reasonable expectation of getting the work; but if they obtain it in competition, their position will be far more satisfactory all round.

* * *

The Apprenticeship Problem. The apprenticeship question is assuming considerable importance, both in this country and in France. Our National Federation of Building Trades Employers is giving it very earnest consideration; and we now learn that the permanent mixed commission of the building industries of France has decided upon taking certain definite steps towards placing the matter on a truly national basis. Last August it was agreed to confer with various trade organisations as to the desirability of holding a national congress on the subject—the "crisis," it is called in the French newspapers—and the response has warranted a definite arrangement. Nearly 400 organisations, of employers and of employees, Parisian and provincial, have signified their interest in such a congress, and it has been therefore decided to hold a "National and General Congress of Industry, Commerce, and Labour," which will take place at the Salle d'Horticulture, 84, Rue de Grenelle, on April 19th, 20th, and 21st next, and it may be useful to note that all communications on the subject should be addressed to MM. Bertin and Vergoz, general secretaries of the Congress, 30, Rue Beaubourg, Paris; and that the treasurer is M. Soulé, president of the French National Federation of Builders, 13, Rue de Thorigny. The proceedings of this congress will certainly be watched with sympathetic interest from this side of the channel; and if the sanguine anticipations of the organisers that the congress will be able to solve the problem once for all, are not realised, it is at least probable that a congress so liberally constituted will be able to contribute something material to our knowledge of industrial economy.

THE R.I.B.A. PRIZES AND STUDENTSHIP AWARDS.

The collection of drawings submitted in competition for the R.I.B.A. prizes and studentships for the current year, and now on view at the gallery of the Alpine Club, will well repay a visit. Although as, unfortunately, is too often the case, the quality of the draughtsmanship is, in the majority of instances, much superior to that of the designs, yet it must be conceded that on this occasion one or two very fair examples of the real art of the architect have been received.

The Institute silver medal and the sum of ten guineas for the best set of measured drawings of any important building, Classical or Mediæval, in the United Kingdom or abroad, have been awarded to Mr. Ernest W. Wray, of York, who exhibits some carefully prepared geometrical drawings of the Church of the Madonna di San Biagio, Montepulciano, a well-known building designed by Antonio San Gallo the elder, in 1518. The half-inch scale drawings and the sheet of full-size mouldings, are good examples of painstaking draughtsmanship, and the section is particularly interesting on account of the somewhat unusual character of the internal treatment of the church, which includes a single massive Doric order and entablature, terminating at the springing of the vaulted roof.

Mr. Alan G. Brace, of Lapworth, Warwickshire, receives a medal of merit for an excellent set of drawings of Lavenham Church, Suffolk. Although we intended to limit our remarks to the works submitted by the successful competitors, yet we feel bound to call attention to the particularly fine drawings of Greenwich Hospital, exhibited under the motto *Metopemania*. The Soane medallion and the sum of one hundred pounds, for the best design for a casino on the borders of a lake, are taken by Mr. Anthony R. Barker, of Harrow, whose well-planned, but rather florid, design is shown to advantage in a good set of drawings, the weakest of which is the half-inch scale detail. An attractive perspective, in water colour, accompanies the geometrical drawings. The design submitted by Mr. Adrian Berrington, of London, which receives honourable mention and the sum of £21, is an exceedingly able one, and its architectural treatment appears to us to be far more suitable and appropriate to the subject than that to which the first place has been awarded. The cleverly rendered perspective sketch shows that its author possesses much artistic power.

The Pugin Travelling Studentship, founded for the promotion of the study of the Mediæval architecture of Great Britain and Ireland, has been secured by Mr. Sydney H. Miller, to whom a silver medal and the sum of £40 have been awarded. Mr. Miller submits some of the very best drawings which have been received in competition for the Pugin studentship for many years past, and all of his examples, in addition to being well drawn, are well chosen.

Among other beautiful works we noticed a fine pencil rendering of a bay from the Presbytery, Ely—a measured sketch, accompanied by quarter scale details, of the Sedilia at Hawton Church, and perspective views from the Chapter House, Southwell, Leverington Church, Pershore Abbey, Magdalen College, Oxford, and drawings of the charming sanctus bell-cot at Walpole St. Peter's, Norwich.

Mr. H. Hubert Fraser, who has been awarded the sum of £10 10s., has also submitted an excellent set of drawings, among which we noticed a particularly good work, in pencil, illustrating the sepulchre at All Saints' Church, Hawton, Notts., and many other interesting examples, including a large scale detail drawing, in colour, of the Church of SS. Peter and Paul, at Knapton, Norfolk, measured drawings of the porch of Southwold Church, a coloured view of Heckington Church, Lincoln, and drawings of the stained glass from one of the windows in All Saints' Church, York.

The Owen Jones studentship for the encouragement of the study of architecture (more particularly in respect to ornament and coloured decoration), has not been awarded, there being only one set of drawings submitted, for which Mr. S. Herbert Maw receives the sum of twenty guineas in recognition of the merit they display. The works are interesting evidence of their author's industry, which, however, does not appear to have been altogether well applied. The subjects selected for illustration include the elaborately decorative ceilings of the Scala D'Oro and the Scala di Collegio of the Ducal Palace, Venice, and large scale coloured drawings of the Corsini Chapel of S. Giovanni in Laterane, Rome.

The Tite prize, consisting of a certificate and thirty pounds, for the best design (according to the principles of Palladio, Vignola, Wren, or Chambers), for a covered arcade of shops, is carried off by Mr. Richard W. M. Gunn, of Glasgow, and in the same competition the designs of Mr. Bertram Edwin Lisle, of Wandsworth, and Mr. S. Herbert Maw, of Hull, receive special prizes of £15 15s. and £10 10s. respectively.

Mr. Gunn submits some charming drawings delicately rendered in pencil. The internal treatment of the scheme is excellent, but the facade to the streets can scarcely be regarded as a successful effort of design. The perspective view is beautifully drawn, and the half-inch scale detail is another fine example of good draughtsmanship.

Mr. Lisle's very able and practical design runs the selected one very closely in everything but draughtsmanship. Its internal treatment is simple and appropriate, whilst externally his elevation is superior to that awarded the first place, although the small blocked columns of the entrance are out of scale with the main order. Mr. Maw's drawings are wonderfully well executed, but his planning is rather weak.

The Grissell prize, consisting of a gold medal and a sum of ten guineas, for the encouragement of the study of construction, has been awarded to Mr. Douglas William Day, of Leicester, for his design for a landing stage forming the principal approach to a royal palace.

The successful competitor submits a good constructional drawing of the inner and outer dome of his excellent scheme, which, though perhaps worked out on a far more ambitious scale than the conditions suggested, is, in point of merit, far superior to any of the very poor designs submitted by his rivals.

The Arthur Cates prize is taken by Mr. Leslie Wilkinson, who sends a fine collection of masterly works, some of which, as, for example, a design for a British Embassy, have done duty elsewhere. Among the exhibits are some good measured drawings from St. James' Church, Piccadilly—a tinted sketch of the doorway of St. John's College, Oxford, a measured sketch of the Gran Guardia Vecchia, a charming water-colour of the Campanile de la Palazzo, Verona, a sheet of diagrams of constructional masonry, and sketches of St. Mark's, Venice, the Radcliffe Library, Oxford, and other well-known buildings.

The Godwin Bursary and Wimperis bequest, consisting of a silver medal and the sum of sixty-five pounds, founded for the promotion of the study of works of modern architecture abroad, has been awarded to Mr. J. A. Allan, who submits a portfolio of working drawings of Ruthrieston School, Aberdeen, and five sheets of detail and other drawings, and photographs of school buildings at home and abroad.

The Institute silver medal and twenty-five guineas for an essay on "The Influence of Architecture of Modern Methods of Construction" have been awarded to Mr. Henry A. Hill, B.A., of Bayswater, W., the sum of ten guineas to Mr. Horace Cubitt, and honourable mention to Mr. J. MacLaren Ross.

The successful essayist touches upon the development of architecture during the last hundred years, which he regards as the result of "Utilitarian æsthetic and structural influences," and refers, as illustrations, to many recently-completed London buildings, such as Dewar's, Mappin and Webb's; and with reference to the latter, the author remarks, "one may or may not like this very original fantasia upon Classic motives so totally regardless of Classic forms."

Architectural Societies.

R.I.B.A.

In the discussion on the paper on "Public Abattoirs," read by Mr. R. Stephen Ayling, F.R.I.B.A., before the Institute, on January 18th (see p. 53 of our issue of January 20th),

Mr. SYDNEY PERKS said he had understood Mr. Ayling to observe that London did not possess a single public abattoir, but he (Mr. Perks) would like to remind him that there was one such at Islington, opened a little over a year ago, and upon which the Corporation of London had expended from £30,000 to £40,000. Here there were a fully-qualified veterinary surgeon, and a staff of assistants. A large party of municipal authorities had visited many of the chief foreign abattoirs, and, upon comparing them with the one at Islington, had pronounced emphatically in favour of the latter.

Mr. J. C. NICHOL said that from impressions gained while visiting the important continental slaughter-houses, some ten years ago, he rather sympathised with the remarks of Mr. Perks. Nevertheless, the lecturer was to be congratulated upon putting together intelligibly a large amount of information that must have been difficult to obtain. In his (the speaker's) opinion, the great point in slaughter-houses was the design; but it would be ill-advised policy to follow the French system of planning. Most of the abattoirs at Paris were built upon precisely the same plan, and this method could not possibly apply to London, or to our provincial towns. The Birmingham Corporation had erected a slaughterhouse upon a restricted area of ground, and had tried the experiment of placing the stables on top of the house, a method of construction that had proved very satisfactory. Turning to another aspect of Mr. Ayling's paper, he had failed to observe any expression of offence in the eye of an animal, upon witnessing the death of a fellow. He knew that blue spectacles placed over the animals' eyes, and many other devices, had been variously adopted, but had constituted a hindrance rather than a help to the slaughterer in the execution of his work. He strongly advocated the con-

GIRLS' NEW HIGH SCHOOL, GLOUCESTER: MAIN CORRIDOR. WALTER B. WOOD, A.R.I.B.A., ARCHITECT.

struction of slaughter-houses under one continuous roof.

Mr. NIXON HORSFIELD proposed a cordial vote of thanks to the lecturer for his exceedingly meritorious and instructive paper.

Mr. ERNEST GEORGE briefly commented upon the discussion.

Mr. STEPHEN AYLING, replying to the vote of thanks, said, with respect to Mr. Perks's remarks on the Islington building, that that was not what he understood to be a public abattoir. It was built by the City Corporation, and the expense was not defrayed out of the rates. He did not advocate the building of abattoirs in central London, but rather in the suburbs, where there was plenty of room. He had not mentioned the provincial abattoir, this being a side issue, but he believed that were a line to be drawn from the Wash to the South of Wales, fully nine-tenths of the abattoirs would be found above, and the remaining one-tenth below that line.

The designs and drawings submitted for the Institute prizes and studentships have been placed on exhibition in the gallery of the Alpine Club (entrance in Mill Street, Conduit Street, W.). The awards, as read at the Council's meeting on January 18th, were published in our issue of January 20th. It should be added that. for his five strainers of Lavenham parish church Mr. Alan G. Brace received a certificate of hon. mention and books to the value of five pounds.

The Council, on the recommendation of the Board of Examiners (architecture), have awarded the Ashpitel prize (books value £10) to Mr. Horace James Ash, of Nuneaton, who was registered probationer in 1893, student in 1902, and passed the Final examination in November, 1908.

The Council have approved the drawings executed by Mr. Harold Cooper, the Soane medallist of 1907, who travelled in Italy, Switzerland, and France; also the work of Mr. Arthur R. H. Jackson, the Owen Jones student of 1907, who travelled in Northern Italy, Greece, and Turkey; also the work of Mr. G. Salway Nicol, the Tite prizeman of 1907, who travelled in Italy; and the drawings of Mr. Sydney G. Follett, the Pugin student of 1908, who travelled in Northamptonshire, Lincolnshire, Oxfordshire, Worcestershire, Gloucestershire, Wiltshire, and Somersetshire.

Manchester Degrees in Architecture.

A prospectus of the Manchester School of Architecture, which has been established pursuant to arrangement between the University of Manchester, the Manchester Education Committee, and the Manchester Society of Architects, shows that the director is Professor Capper. M.A., A.R.I.B.A., who has for coadjutors. Mr. J. Lindsay Grant as lecturer in architecture, Mr. R. Glazier, A.R.I.B.A., headmaster of the Municipal School of Art, and other members of the staff of that school, of the Municipal School of Technology, and of the University; while Mr. W. Leicester, M.S.A., is lecturer in building construction. Members of the advisory committee, as representing the Manchester Society of Architects, are Mr. Paul Ogden, F.R.I.B.A., and Mr. J. H. Woodhouse, F.R.I.B.A. The visitors nominated by the R.I.B.A. are Mr. Mervyn Macartney, M.A., F.R.I.B.A., and Mr. J. Slater, B.A., F.R.I.B.A. The University offers two degrees to students of architecture—(1) In the faculty of arts, the degree of Bachelor of Arts with honours in architecture; (2) in the faculty of technology, the degree of Bachelor of Technical Science.

The subjects of the matriculation examination are —(1) English language or literature; (2) English history; (3) mathematics; (4) three of the following (one of which must be a language): i. Greek, ii. Latin, iii. French, iv. German, v. some other language approved by the Board, vi. mechanics or physics, vii. chemistry, viii. geography (physical, political, and commercial), ix. natural history (plants and animals).

The intermediate examination includes the following subjects:—A.—For the degree of B.A.: (a) Greek, Latin, French, German; (b) ancient history, modern history, English literature; (c) physics, pure mathematics, applied mathematics. B.—For the degree of B.Sc.Tech.: (a) Mathematics, (b) physics, (c) a language (other than English).

The final course for the degree of B.A. or B.Sc.Tech. includes the following subjects: A.—For the degree of B.A. and B.Sc.Tech.: 1, History of architecture: (a) general architectural history; (b) Renaissance and modern architecture. 2, Architectural construction: (a) Building construction and sanitation (surveying may be taken as an additional subject); (b) graphic statics, theory of structures, strength and testing of materials. 3, Architectural design: (a) Freehand and architectural drawing; (b) thesis with memoir; (c) oral examination (if required). 4, Architecture (special). Additional subjects for the B.A. are:—Two of the following, one of which must be (a) or (b):—(a) general history of art; (b) history of classic art; (c) advanced freehand drawing; (d) measured drawing of a building, with memoir; (e) modelling; (f) decorative design. Additional subjects for the degree of B.Sc.Tech. are:—Applied mechanics and graphic statics, special architectural construction, surveying, chemistry. The final examination is arranged in two parts, both of which, however, may be taken together at the end of the final year. Candidates who have obtained the University degree in architecture are exempted by the R.I.B.A. from all but the final examination qualifying for A.R.I.B.A.

Further particulars may be obtained from Messrs. Sherratt and Hughes, publishers to the University, 27, St. Ann's Street, Manchester.

Proposed New Works.

BARNES, SURREY.—The District Council has approved plans for the following:—Five shops, Sheen Lane, Mr. W. Connock; alterations to 161, Castelnau, Messrs. Boon and Porter; and alterations to 206, Upper Richmond Road, Mr. T. Jones.

BRIDLINGTON.—The Town Council are applying to the L.G.B. for a loan of £10,670 for the new Burlington schools. The subcontractors are:—For excavating, bricklaying, and plastering, Mr. John Sawdon, builder; mason, Mr. Preston; slater, Messrs. Dawber and Co.; carpenter, Mr. Moore; ironmonger, Messrs Everingham; plumber and electrician, Mr Jarvis; painter, Mr. Siddall; heating, Mr. W. A. Nettleship.

CARDIFF.—The Board of Education have approved the plans for a new intermediate school, and the building committee will invite tenders for its erection without delay.

LEIGH-ON-SEA.—The Urban Council have passed plans for the erection of new Council Offices, and are to apply to the L.G. Board for a loan of £4,500 to carry out the works.

LONDON: KENSINGTON GORE.—A fund has been opened for the erection of a reredos in Holy Trinity Church as a memorial to the late G. F. Bodley, R.A. Holy Trinity Church was one of the last churches designed by Mr. Bodley, and the reredos proposed to be erected was designed by the late distinguished architect, but not carried out for want of funds.

LONDON, W.—An extensive building proposal, estimated to cost £250,000, is in contemplation by William Whiteley, Ltd., who have offered the Paddington Council £60,000 for the freehold of the Queen's Park baths and wash-houses.

RICHMOND, SURREY.—The Town Council have approved the following:—Mr. Edwin Evans, ten dwelling houses in Burlington Avenue; Messrs. Watney, Combe, Reid, and Co., rebuilding of the "Beehive" public-house, Lower Richmond Road.

STONE, KENT.—It is proposed to ask the County Council to erect a new school here

SOUTHEND-ON-SEA.—The Town Council have approved plans for the following:—Four houses, Crowstone Road and South Avenue, Westcliff, J. Bane; one house, Bournemouth Park Road, William Steel; house, stable, etc., rear of Southchurch Road, corner of Milton Street, H. J. Kelly, M.R.C.V.S.; one house, Imperial Avenue, J. Rothschild; two houses, Chalkwell Gardens, corner of Sandleigh Road, Charles May; two houses, Westborough Road, G. H. Griffiths; two houses, Hill Road, A. W. Knights; one house, Undercliff Gardens, J. Crossland; one house, Cliff Road and Sea View Road, F. Bradford; one house. Westborough Road, T. Lawford; six houses, Surbiton Road, J. Goldsworthy; one house, Southchurch Beach Parade, T. Cooper; two houses, Whitefriars Crescent, A. S. Barley; one house, Whitefriars Crescent, J. Batchelor; bungalow, Southbourne Grove, D. E. Kerridge; bungalow, Fairmead Avenue, D. E. Kerridge; two houses and shops, Hamlet Court Road, corner of St. John's Road, John Jones; one house, North Avenue, C. Cade; additions, 29, Dowsett Avenue, Dr. J. B. Maxwell; house and shop Leigh Road East, B. Flory; two houses, Eastwood Road, J. Sears.

WALLSEND.—A new parochial hall for St. Luke's Church is to be built, and funds are now being collected.

WINCHESTER.—A new County school for girls is to erected here at a cost of £8,475. A site has already been secured from the Ecclesiastical Commissioners.

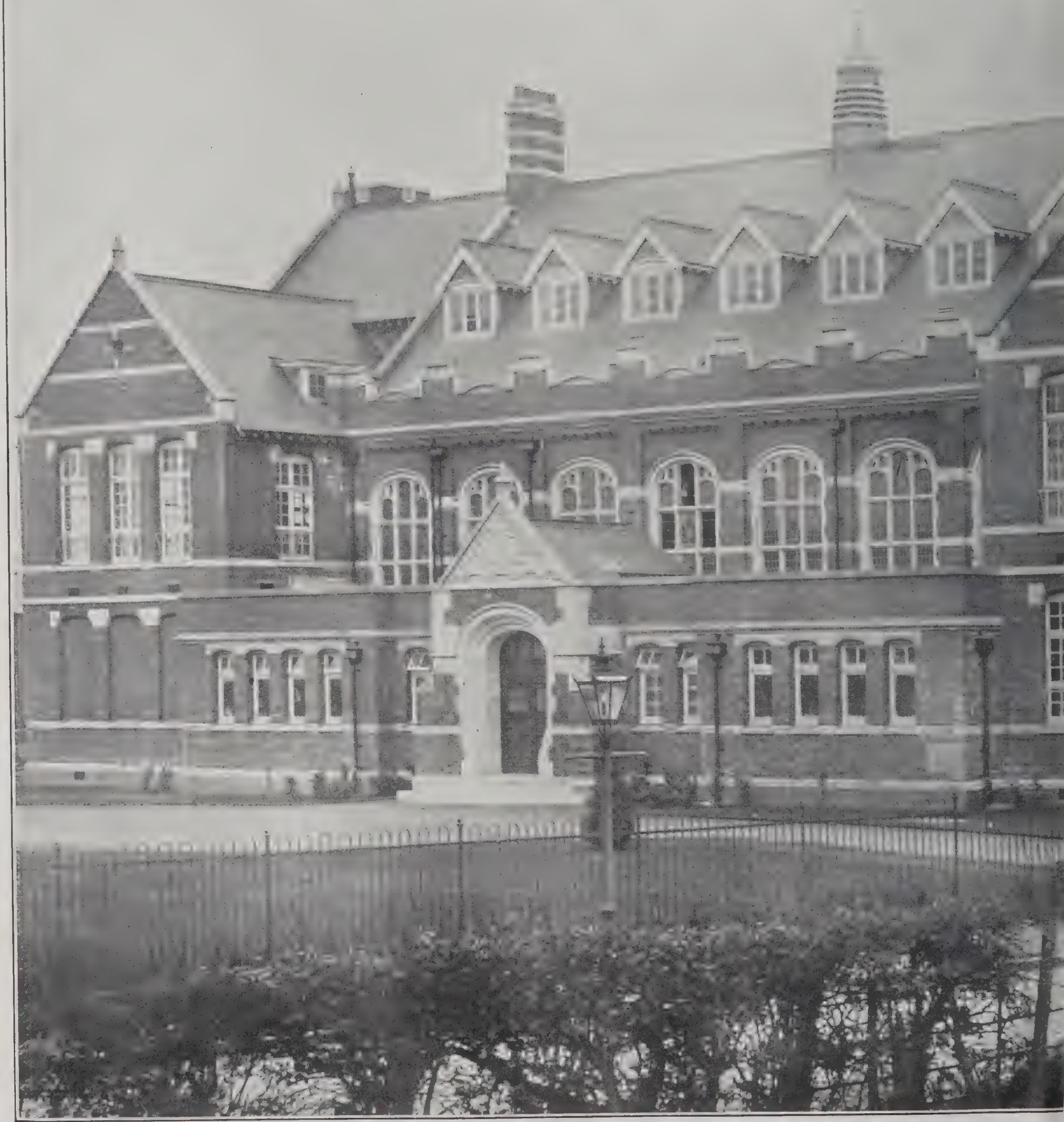
WOLSINGHAM.—Plans submitted by the Surveyor to the Weardale R.D. Council for a new secondary school here have been approved.

Our Plate.

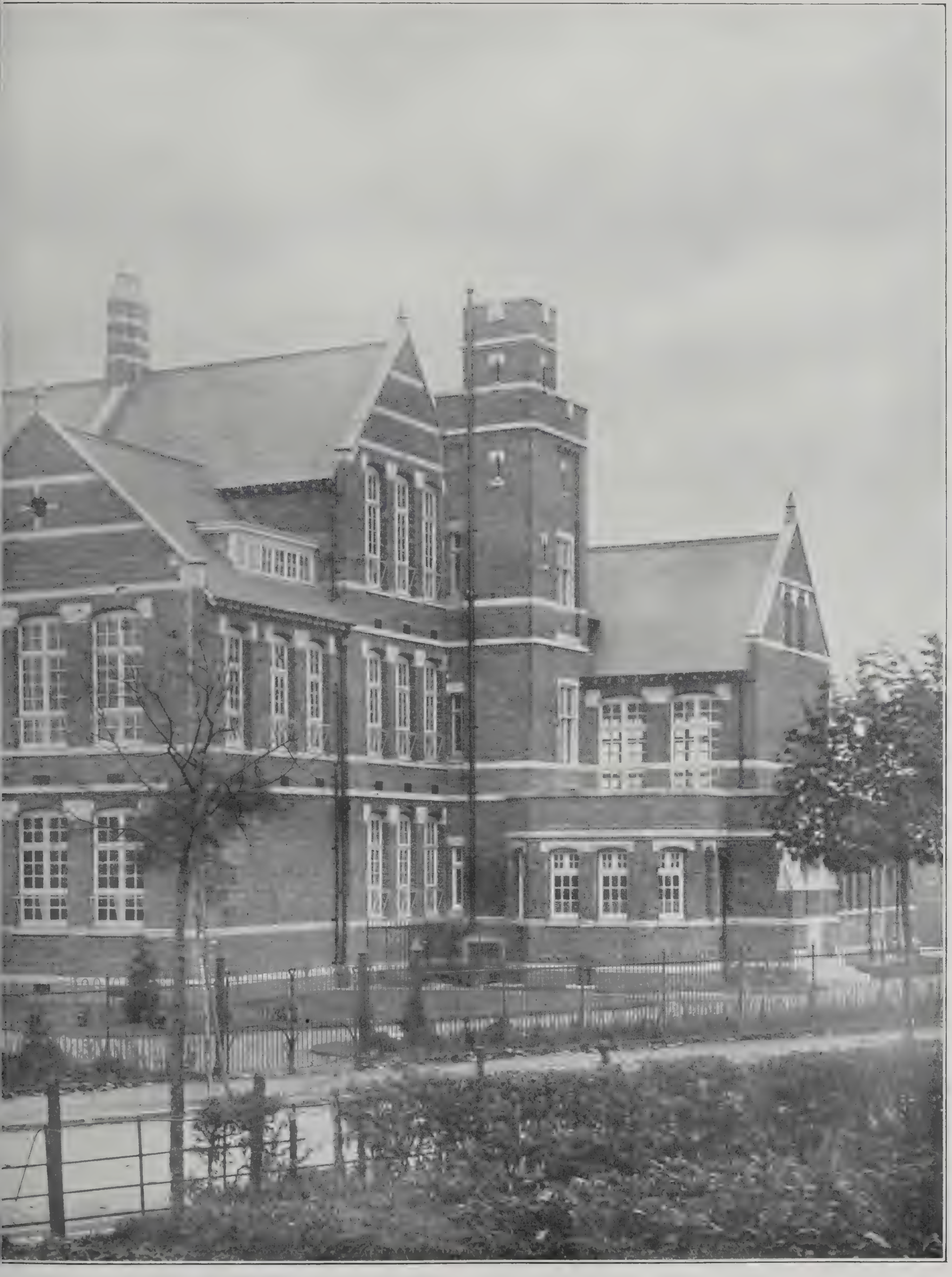
Girls' New High School, Gloucester.

The school of which the elevation is shown in our plate gives accommodation for 350 girls. The buildings are erected of local bricks, with Bath stone dressings, and the roofs are covered with Staffordshire tiles. The floors and staircases are of Hennebique reinforced concrete, executed by Messrs. Hobrough and Co., of Gloucester, and the floors are covered with maple-wood blocks. The main hall is 72ft. long by 34ft. wide and 27ft. high. The fifteen class-rooms are arranged to accommodate twenty-five desks each, but the rooms are made large enough to accommodate thirty desks without any increase of floor-space. The dining-room gives accommodation for 127 pupils. A roof terrace is provided over the second-floor corridor, and there are store-rooms in the roofs. The school is lighted throughout by electricity, and warmed with pipes and radiators on the low-pressure system. The builders' work has been carried out by Messrs. J. C. Wheeler and Sons, of Gloucester, from the designs and under the superintendence of Mr. Walter B. Wood, A.R.I.B.A., of Gloucester.

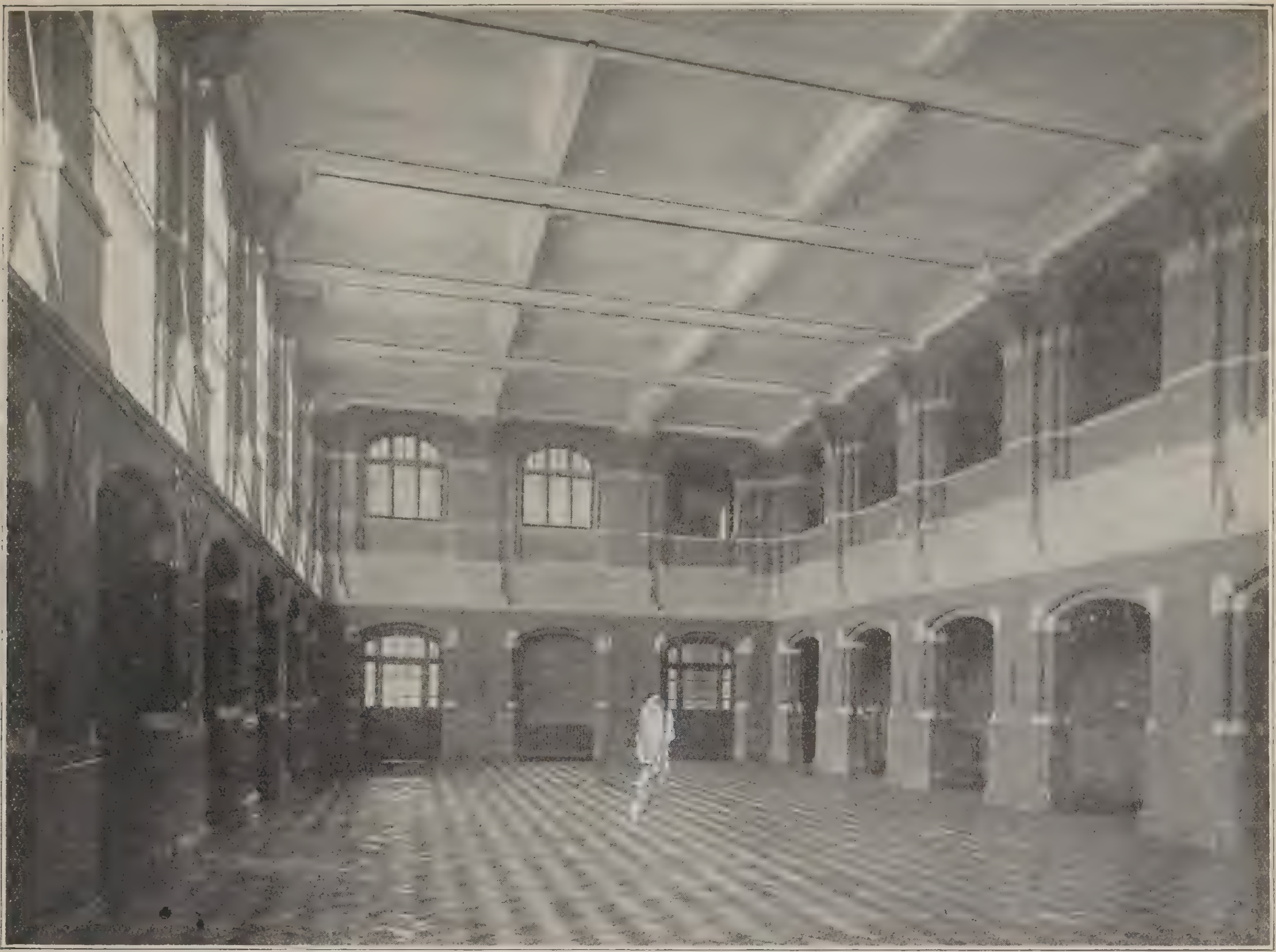
The reporter general of the Paris Municipal Budget, who already upon three occasions has endeavoured to enlist the interest of his colleagues in the Municipal Council in his plans for the improvement of the principal thoroughfares and public places of the city, has now drawn up a fourth scheme, which contemplates an expenditure of £16,000,000 for this purpose. Among the more important items which figure in the programme are votes for the completion of the Boulevard Haussmann at a cost of £2,000,000, and of the Central Markets, at a cost of £1,500,000. Votes on a similar scale are set down for the extension and widening of a number of other streets, and special attention is drawn to the fact that the scheme has been planned in such a way that all the principal wards of the metropolis would benefit uniformly by the proposed improvements. In addition, a sum of £4,600,000 is demanded for a reorganisation of the water supply, £3,680,000 for an education loan, and £1,450,000 to combat tuberculosis, etc.



GIRLS' NEW HIGH SCHOOL, GLOUCESTER. VIEW FROM



SOUTH-WEST. WALTER B. WOOD, A.R.I.B.A., ARCHITECT.



GIRLS' NEW HIGH SCHOOL, GLOUCESTER: THE ASSEMBLY HALL. WALTER B. WOOD, A.R.I.B.A., ARCHITECT.

Works in Progress and Completed.

ALTRINCHAM.—The District Council have accepted the tender of a local firm for the erection of a new hospital. Amount of tender, £8,700. The architect is Mr. William Owen, of Manchester.

ASHTON-UNDER-LYNE. — New textile offices for the South-East Lancashire Card and Blowing Room Association are to be erected. Mr. H. Lindley is the architect.

ANSDELL.—An Institute is in course of erection at a cost of £5,000, from plans by Mr. G. H. Willoughby, of Manchester.

BOTHWELL.—The Donald Institute is to be proceeded with. The architects are Messrs. Alexander Cullen, Lochhead and Brown, of Hamilton.

BRIDGE-OF-WEIR. — The foundation stone of St. Mary the Virgin Episcopal Church has been laid. The architects are Messrs. Dykes and Dale, and the contractor Mr. Jas. Keanie, of Johnstone.

COALVILLE.—A new secondary school is in course of erection by Messrs. W. Corah and Son, of Loughborough, at a cost of £7,250, the architects being Messrs. Barrowcliff and Alcock, of Loughborough.

FORMBY.—On January 12th, Holy Trinity Church New Parish Hall was opened. The building, which cost about £2,200, was designed by Messrs. Havelock-Sutton and Son, Liverpool. The contractors were Messrs. J. and G. Chappell, Walton, Liverpool.

HONG KONG, CHINA.—A stained glass window has recently been unveiled in the Cathedral here, by Sir F. D. Lugard, to the memory of Bishop Hoare, who lost his life in the typhoon of 1906. Appropriate subjects have been chosen as follows:—The Storm on the Lake; Christ walking on the waters; the calling of the Apostles by the Sea of Galilee; and the vision of St. John on the Isle of Patmos. The window, which has been much admired, was designed and executed by William Morris and Company (Ruskin House), Ltd., Westminster.

LEYTON, ESSEX.—The Parish Hall and Institute in connection with Christ Church, built at a cost of £1,835, has been opened.

LIVERPOOL.—The foundation stone of the new dental hospital has been laid. The building, together with its equipment, is to cost £10,000.

LIVERPOOL.—The Bank Telephone Exchange, South John Street, is now in course of erection from designs by Messrs. Bromley and Watkins, architects, Nottingham. The whole of the constructional steelwork and fire-resisting floors are being carried out by Messrs. Homan and Rodgers, Manchester.

LONDON: GOLDER'S GREEN.—The temporary church will be completed by June. Mr. Herbert Wills (Wills and Anderson) is the architect, and Messrs. F. and C. Foster, Norwood, are the contractors.

LONDON, W.C.—A cast of the Bacon statue, by Mr. F. W. Pomeroy, A.R.A., has been erected on a wooden pedestal in South Square, Grays Inn. The finished bronze will probably not be erected until 1910.

MANCHESTER.—The erection of the new Whitefield Wesleyan Church will be begun in March. The cost will be about £2,500. Mr. A. Brocklehurst, of Manchester, is the architect.

OLD COLWYN.—Plans for the proposed first portion of the new Wesleyan Methodist Church and Schools have been passed by the Trustees, and the tender of Mr. J. O. Davies, Colwyn Bay, has been accepted. The design shows a large school-church with two transepts and chancel, vestries, etc. Local stone will be used for the walls, which will be finished in roughly squared stones, the roof will be entirely open, with pitch-pine roof trusses, and green Welsh slates will be used for the roof covering. A quaint timber porch will be placed at the public entrance. This building will work out at an exceedingly low cost per sitting, and is the beginning of a much larger scheme, the designs for which have been sketched out, and which will comprise a large church of local stone, with bell-tower, etc. The architects are Messrs. J. M. Porter and Alcock, of Colywn Bay.

ROTHBURY.—The new Parish Hall has been completed and formally opened. Mr. C. S. Errington, A.R.I.B.A., of Newcastle, was the architect.

SHEFFIELD.—The new public baths being erected at Heeley, at a cost of £11,270, will be open to the public in May.

SOUTH MOLTON.—Additional school buildings are in course of erection at a cost of £2,000, including site.

TROON, SCOTLAND.—A new higher grade school was opened here on the 11th inst. Mr. James Miller, A.R.S.A., of Glasgow, was the architect.

TUNSTALL.—Messrs. Johnson Bros., earthenware manufacturers, of Tunstall and Hanley, whose Alexandra Pottery, Tunstall, was recently burnt out, are now having same rebuilt in a more thorough and up-to-date manner. They are also building a new flint mill here, their architects in both cases being Messrs. A. R. Wood and Son, of Tunstall and Burslem. The whole of the constructional steelwork, fire-resisting floors, and asphalte flats, to both jobs, are being carried out by Messrs. Homan and Rodgers, Manchester.

ARCHITECTURAL TREATMENT OF REINFORCED CONCRETE.*

By John H. Markham, A.R.I.B.A.

When I was first asked to read a paper on Reinforced Concrete, it was to have been more especially with reference to Design—that is, I presume, the character of artistic expression suited to this method of construction. I rashly undertook to do this; but in attempting to get together matter for illustration and example, I found the question of the proper artistic treatment had very seldom been fairly tackled in building work of a kind usually within an architect's practice. A good deal of simple straightforward engineering work has been done which, I think, is often of pleasing appearance when not spoilt by any pretence to be other than it is. But when buildings, such as an architect is accustomed to deal with, have been undertaken in this method of construction, the front has generally been built of brick or stone, and the reinforced concrete part all been hidden, as would have been the case with a steel frame. This has compelled me to take up the chief features and principles of this method of construction, and try to deduce therefrom some ideas for the right treatment of it.

Having briefly described the materials employed, the lecturer proceeded: I will now come more particularly to my professed subject, namely, design. And in dealing with design, I shall divide my remarks into three main heads:—I. What I shall call "internal" design. II. Main structural lines and forms. III. Decorative design and finish.

A Peculiarity.

A great peculiarity of reinforced concrete is that, not only, as with other better-known materials, is it necessary to decide on the size a member must be, but it is also necessary to design the internal structure of the member itself. In fact, it is necessary to design the material as well as the building.

In using steel or wood, a member of certain size and section is found necessary, and it consists throughout of the same steel or wood of known, and practically uniform, strength; and all members of the same size and section will be approximately of the same strength. However, the strength of reinforced concrete members of any given size and section may vary within very wide limits, according to the percentage and disposition of the metal, even where the strength of the concrete and steel may be constant. It would be possible to introduce, say, 1 per cent. of metal into a concrete beam without in any way strengthening it; and it would also be possible to introduce 1 per cent. of metal in such a way as to very materially raise the moment of resistance the beam could offer. It is not quite my province to-night to deal with this question of internal design, which is a very large subject, as there are many systems, some of them covered by patents, which make it somewhat awkward for a designer to make use of the method of reinforcement he may consider most suited in each particular kind of member. After briefly detailing the principles of reinforced concrete construction, the lecturer came to the consideration of the general structural lines of erections in these materials.

Lack of Precedent.

In beginning a design for a reinforced concrete structure, the first thing the designer feels is the absolute lack of precedent. In dealing with structures of brick and stone, or even steel, there are by this time more or less recognised ways of solving every ordinary problem of design. If the designer be possessed of great originality, and can deviate from the hackneyed methods in a direction which others feel to be an improvement, then he has not only produced that which is interesting and pleasing, but he has advanced the art of design. But if he find himself unable to improve on the usual solution of the problem, then he is not blamed for adopting it; but he has failed to produce anything possessing special interest.

In designing reinforced concrete, however, no tradition or precedent exists; and if the designer should be unable to evolve from his own brain a form of structure which shall be at once sound as to constructive principles, suitable to the material, beautiful as to form and appearance, and withal practicable from a commercial point of view, then he fails to produce a satisfactory reinforced concrete building. This lack of precedent becomes a very real difficulty in a structure in which the utilitarian requirements give considerable latitude for the possible variations of form. One asks oneself: "How shall I begin? How is a thing of this sort usually done?" Then, to save oneself trouble, one is apt to fall into one of two errors, or possibly both, and to treat the structure as a steel structure would be treated, or else as a stone building.

Ancient Use of Concrete.

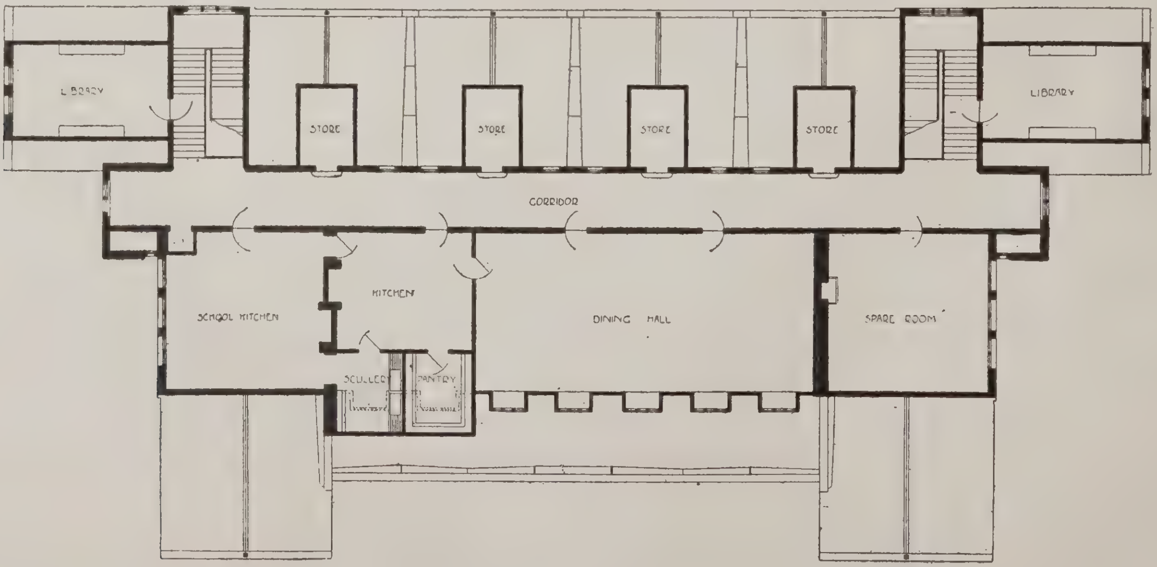
Here I would just refer to the use of concrete as a structural material in ancient times. You will all remember the Roman use of concrete in large masses, though with a kind of reinforcement in the form of brick arches and lacing courses. Their concrete owed much of its strength and durability to the employment of a light volcanic earth, known as pozzolana, which formed with the lime a very strong hydraulic mortar. The chief uses to which concrete was then put were—to form floors, or to form large vaults and domes with brick arched ribs and brick lacing courses, or to form walls with, generally, a facing of brick or stone. Since Roman times builders have not had the advantage of such an excellent material as pozzolana, and concrete almost dropped into disuse. Something similar was probably used for foundations in the form of very coarse and random rubble work, and as a covering to vaults in the mediæval buildings, but it is not anywhere evident as a part of the designed structure.

Roman Practice No Precedent.

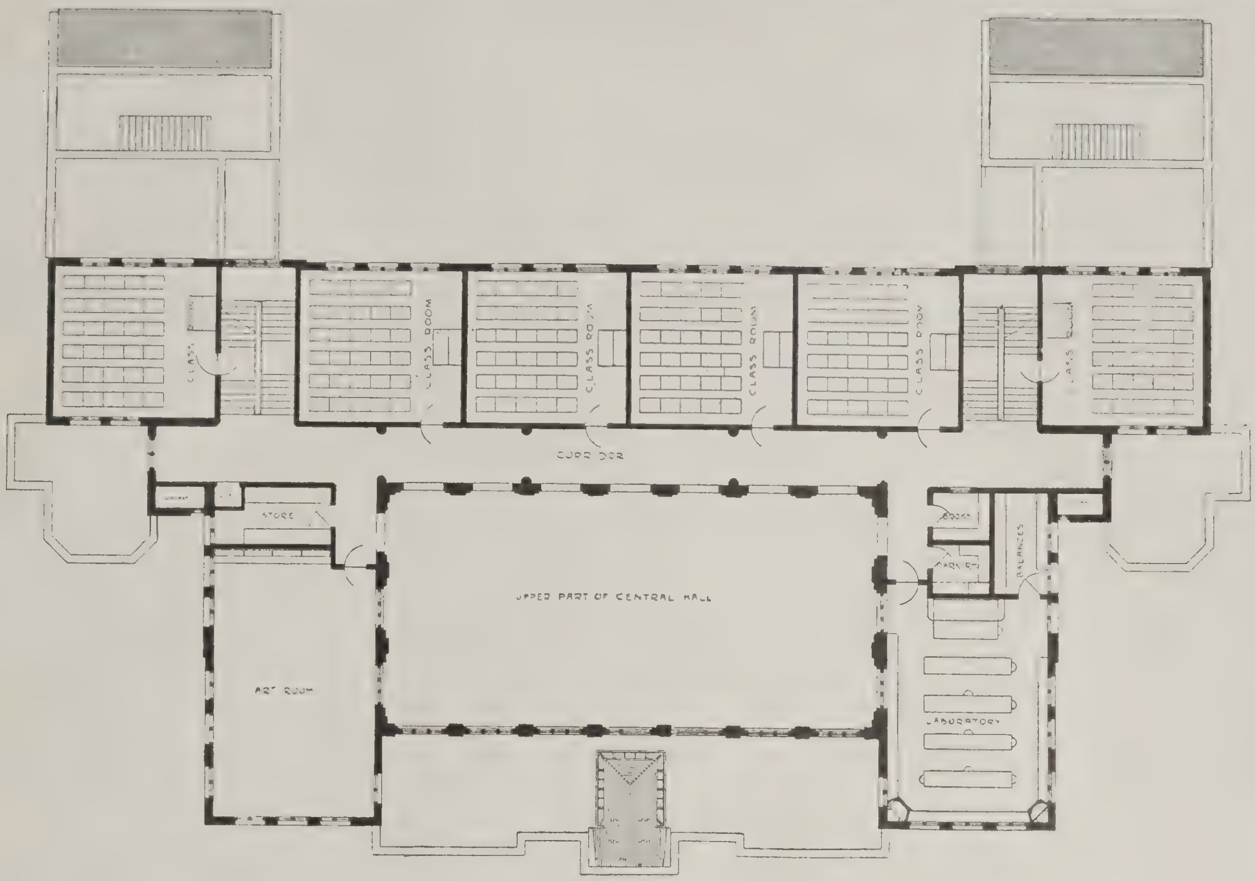
As to structural lines, the Roman use of concrete affords us no precedent for designing in reinforcement concrete, because their use of the material was in enormous masses, and could only be where the principal stresses were compressive. Their concrete domes are said to have had no thrust, but act merely as inverted saucers. Where they supported nothing but their own weight, the thrust might have been negligible; but it seems to me that there must have been a sort of internal arch action amongst the particles of the mass, and the thrust so produced, if not transmitted to the walls, must have been counteracted by the tensile strength of the concrete. If a superimposed load were placed on the dome, I think this thrust would surely have become more than the tensile resistance of the concrete could withstand, and unless some outside aid were forthcoming, the whole would collapse. However, as I have already stated, we do not rely on the tensile resistance of concrete in any way. Wherever tensile stress exists, steel must be introduced. Moreover, another essential difference is that, whereas a Roman concrete wall was of very considerable, and practically uniform, thickness, taking stresses all along, in reinforced concrete no such arrangement is permissible. A wall consists of a framework of stanchions and beams, which take all the stresses, and the remainder of the wall is formed of mere screen panels of very little thickness. This is true of steel-frame buildings also; and it is this principle which is the only one that will affect the structural lines of architectural buildings. By architectural buildings, I mean those forms of structures usually designed by architects as distinct from engineering structures, such as bridges, large roofs, water towers, etc. I think this framework and panel treatment should make itself very evident; and it would seem quite suitable to build the panels afterwards in some other material, as brick, stone, block concrete, or

---

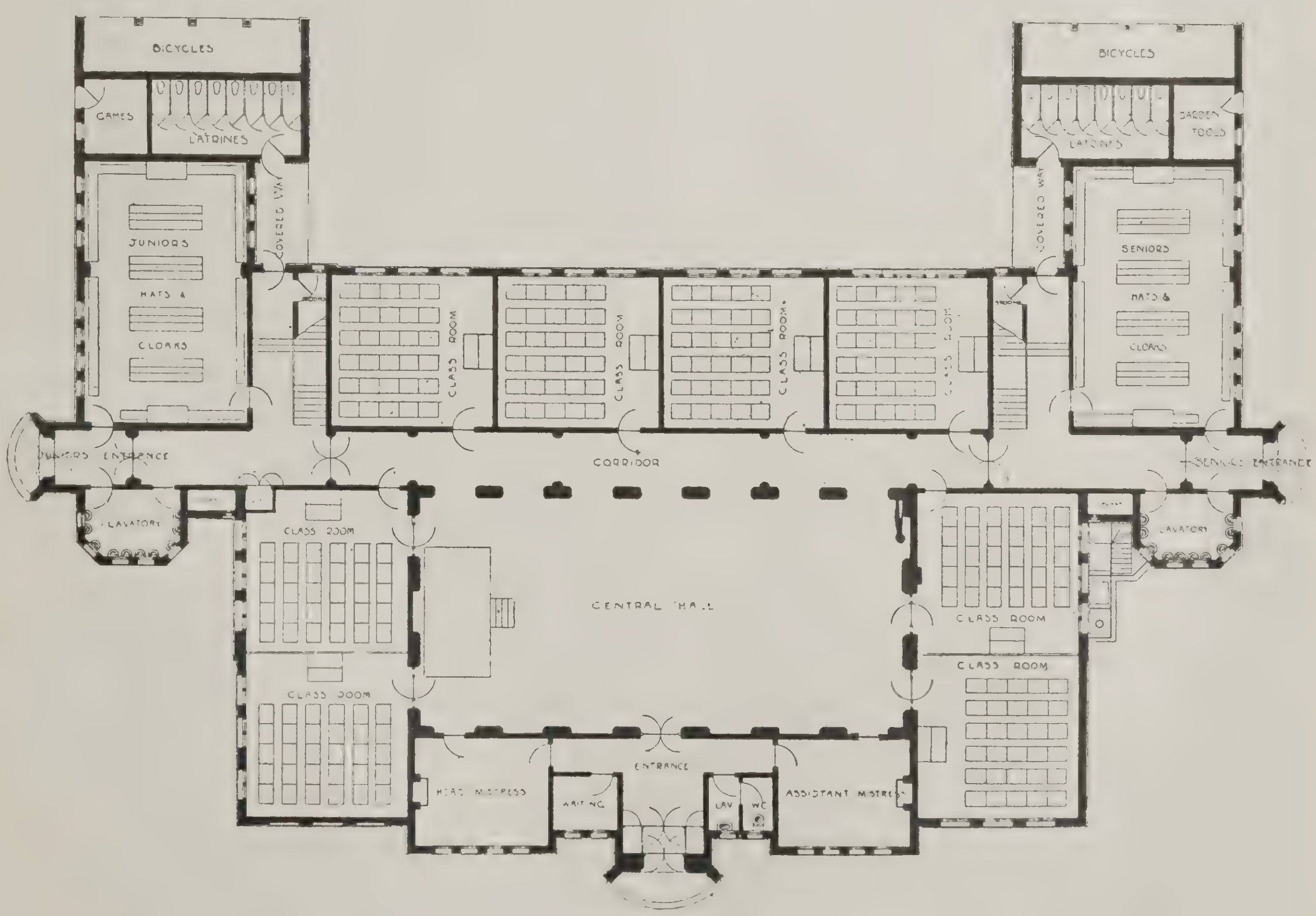
*Substance of a paper entitled "Reinforced Concrete," read on January 22nd, before a meeting of the Architectural Association, by Mr. John H. Markham, A.R.I.B.A.



GIRLS' NEW HIGH SCHOOL, GLOUCESTER: SECOND FLOOR PLAN. WALTER B. WOOD, A.R.I.B.A., ARCHITECT.



First Floor Plan.



Ground Floor Plan.

GIRLS' NEW HIGH SCHOOL, GLOUCESTER. WALTER B. WOOD, A.R.I.B.A., ARCHITECT.

terra cotta, each panel being carried by the beam below it. The vertical members will, as a rule, be emphasised as they are more important, becoming larger and stronger towards the bottom, because there they carry the whole load of the wall, and their proportion of the floor loads, whereas the beams all do practically the same amount of work—i.e, carry the panel over, and a proportion of the floor—and are, therefore, of the same size. However, in some cases the horizontal members are emphasised, and the vertical members kept subservient. In buildings of the warehouse and factory class, the windows are often made to take up the whole of the panel space.

Reinforced Concrete and Steel Construction.

I have alluded to the tendency to treat a reinforced concrete building in the same way as a steel structure as an error. I admit a certain reasonableness in such a course, on account of the fact that both methods of construction are subjected to exactly the same dynamic laws. We have already classed them together as being identical in their effect on the lines of architectural structures; but in engineering works, so-called, they will be somewhat different in their characteristic forms. Perhaps it may be thought somewhat out of place for me to address you on the subject of engineering; but I see no sufficient reason for the distinction between engineering and architecture. In old times, bridges, towers, viaducts, and such like erections, were designed and carried out by the same men who designed public buildings, and probably private houses as well; so that I shall presume we still maintain some sort of intelligent interest in such work, though we may never be called upon to undertake it.

Scope of Reinforced Concrete.

There will, I think, be much more scope for the use of reinforced concrete, and opportunity to evolve a suitable style of design in such buildings as: bridges, large roofs, as over swimming baths, etc., towers for various purposes, lighthouses, tanks and reservoirs, to say nothing of all kinds of foundation work, than there will be in architectural buildings; and it is such I shall have in mind in speaking of the difference between steel and reinforced concrete.

In these structures, reinforced concrete is likely to find favour, because it does not need the periodic painting necessary to preserve a steel structure from corrosion. In most, if not all, works of this kind, economy of cost is an important consideration; and in steelwork the cost varies approximately as the amount of material employed. Not so with reinforced concrete. In a plain and simple building of reinforced concrete, about 30 per cent. of the total cost is expended on centreing and falsework alone, which all disappears when the structure is complete. Again, the metal costs a great deal more than the concrete, bulk for bulk, so that it may quite well happen that a design, which uses a considerably larger quantity of material than the minimum possible, may be of much less expense in execution, because it is of such a simple character, that a great saving of falsework is effected, or members are so skilfully arranged, both as to position and their internal composition, that the concrete is made to do as much work as possible, and the minimum quantity of metal is used. Therefore, I should say, first and foremost, let parts be simple and large, rather than intricate and small.

"A Certain All-overishness."

In steel structures a certain all-overishness is often noticeable, arising from the use of small members in a sort of truss form of spider's web appearance; but in reinforced concrete it is better, if possible, to use larger main members and confine the connecting trusswork to certain parts. This gives a pleasing appearance from the fact that the more intricate parts are concentrated, and the main members emphasised. This is, of course, not always possible, but can sometimes be contrived with a little thought. The volume of material is increased, but a saving may be effected on the falsework. (The ethics of imitating stone work I speak of under my third heading.) Moreover, a great saving is effected if parts are repeated so that the same falsework may be used more than once; only it is not much good repeating any particular form of feature in another part of the structure much on the same level, because the falsework will be wanted in both places at the same time. Where repetition occurs, it should, if possible, be arranged so that the falsework will be finished with in one place before it is wanted at another. I am not advocating the repetition of parts *ad nauseam* by any means, but it is quite possible often for the same form to be repeated two or three times with very slight variation, not necessitating much adjustment of the falsework. In this connection I would mention that I have been told that it is not found economical to use the same wooden centreing more than three or four times. After that it becomes warped and surface hardened, and the expense of correcting the defects is as great as forming new.

I need scarcely speak of the advisability of concentrating ornament, and using it on the parts which have no great structural function to perform, so as to leave the main structural members simple and apparent as to their importance. At any rate, ornament, if applied to structural members, should be such as will not in any wise render the member apparently less fit to perform its function.

Decorative Design and Surface Finish.

This brings me to my third and last division: Decorative design and surface finish. In this part of our subject, we may learn a lesson from the Roman builders, in that the surface treatment of concrete may be the same, whether it be used as mass concrete or reinforced. Roman concrete walls were finished in three different ways.

I. *Opus incertum*, where the wall is faced with irregular pointed pieces of stone, placed with the point inwards. II. *Opus reticulatum*, which consists of similar pieces of stone to those of the *opus incertum*, only the faces were square and regular, and the surface presented a sort of network appearance. III. The walls were faced with thin triangular bricks, laid breaking joint. Yet another method was to apply marble slabs, fixed to the wall by metal cramps. This method was also applied to brick and stone walls. Vaults and domes often had coffers cut into their surface, and the whole covered with a fine *cœmentum marmoreum*. All these methods are, of course, still possible, and to them may be added, mosaic, and tiling.

As to modern methods. A very favourite way is to render the surface to resemble stone construction, and in some cases V-shaped strips are nailed to the falsework to form depressions in the finished concrete, similar to V sunk-jointed masonry, and the surface picked over to leave the flat surfaces rough. The attempt to imitate stonework so frequently adopted in buildings of reinforced concrete can scarcely be described as "building in truth," and, therefore, I must condemn it.

Reinforced Concrete Monolithic.

A certain similarity of appearance there will be of necessity between buildings of reinforced concrete and those of stone. I am not urging that this similarity, where it is natural, should be concealed, but I am deprecating any attempt at making the two alike. Two essential differences which I think should certainly have their effect on the types of design suited to each material are:—First, that, whereas stone walls are more or less of even thickness, supporting weight all along, walls of reinforced concrete are composed of stanchions and beams with screens, as before explained. Secondly, many features in stonework design are the outcome of the necessity for using this material in separate blocks. Reinforced concrete is a monolithic material. There are no joints; and I think all that which in stone design is the outcome of the necessity for separate blocks with joints should be eliminated. For instance: a stone column has base, shaft, and capital; and the capital, especially, is distinctly a different piece of stone from that forming the shaft or architrave, and is treated as such. If a reinforced concrete support receives an enriched treatment at its upper end, I think the ornament should run on to the beam above, and possibly connect up with the base of the stanchion over. A reinforced concrete support in the form of a Corinthian column would be most inappropriate, though I would not object to a reinforced concrete beam being moulded as a classic architrave. I think my meaning will be clear.

Screen Fronts.

Another method, which is rather cutting the Gordian knot than untying it, is to do all the structural and internal work in reinforced concrete, and to form the front facing screen in stone on brick, built up independently of the rest of the structure, and attached to it at the floor levels by allowing some of the floor reinforcements to project and be built into the masonry screen. This method is being employed at the road frontage to the New Post Office building. When this is done, care must be taken that the slight settlement of the reinforced concrete structural part, which is bound to take place when loading has been applied, does not throw a certain amount of stress on to the masonry screen, and so cause it to bulge.

It seldom happens that the concrete can be left without further treatment after the removal of the centreing or falsework in cases where the appearance has to be considered at all. Sometimes moulds are lined with zinc, sheet iron, or plaster of Paris, and oiled to prevent adhesion, and a coat of mortar, to give a smooth surface, is applied to the inside of the mould first; and then the concrete and reinforcement put in afterwards, but not forced so as to press through the mortar and appear on the surface when the falsework is removed.

In some large office buildings, erected by the Turner Construction Company of New York, the only treatment applied after the removal of the wood falsework was to put on a coat of cement and white sand with a brush. Another method they have tried is to apply a coat of oil paint, mixed with sand. In cases where very little work is done after the removal of the falsework, some special precautions have to be taken to remove the unsightly variation in texture which is visible wherever a break in the laying occurred.

Coloured Concrete.

A certain percentage of colouring matter may be added to the cement if desired; the amount, say Messrs. Marsh and Dunn in their admirable book on Reinforced Concrete, should not exceed 10 per cent. per volume, and should be less if possible. Of course, care must be taken to ensure that no colouring is used which will have a chemical action on any of the materials used, or be easily affected by the acids and other substances in the atmosphere.

It would seem that in treating the surface of reinforced concrete buildings, all decoration should be comparatively flat, and if any ornamental features are added of considerable projection, they must be reinforced and form part of the structure. The surface coating should be as thin as possible.

Sgraffito Treatment.

I would suggest that a suitable form of decoration would be a kind of sgraffito work done in this manner. The mould to be formed of plaster of Paris, or other smooth surface coated with shellac to prevent adhesion, and having pieces of the form of the sunk ornament about ½in. thick applied thereto in the proper positions. Then render over the inside of the mould with a coloured mortar flush with these applied forms. This coloured mortar will form the main surface of the member when finished; then float over the whole inside of the mould with another coloured mortar, which will form the sunk surface of the ornament; and then put in the concrete and reinforcement, taking care not to push any stones through to disturb the surface. If more adhesion were required between the layers of mortar and the concrete, wire or nails could be stuck into the mortar at intervals from the back as the concrete was being put in.

Plain Surface.

In cases where only a plain surface is required, it may be formed as soon as possible after the removal of the falsework by the application of a rendering with a float, or by splashing it on from a brush to give a roughened surface; or a mortar may be used with fairly large and coarse sand grains which would leave a rough surface. Mortar applied as rendering should be of much the same richness as the concrete, otherwise the expansion and contraction will be different with the risk of the surface becoming detached.

Facing with Faience.

Another method which it seems to me would be quite a satisfactory one for buildings, especially in towns, would be to have the surface formed of faience blocks shaped at the back to connect more rigidly to the concrete. These would be placed in the falsework with small pieces of card or felt in the joints, and the reinforcement and concrete filled in behind in the usual way. This method would have this advantage, that the timber falsework would not need to be quite so carefully and expensively formed, as it has only to hold the faience blocks, it does not come in contact with the concrete; it could, moreover, be soon struck. My idea in suggesting pieces of card, or felt, in the joints was to keep the joints between the faience blocks open, so that, even if a slight settlement of the structure occurred, no weight would be thrown on the faience. Of course, these strips would afterwards be removed, and the joints pointed up in cement. This is only a variation of the Roman methods already described.

Brickwork Wall Screens.

Another treatment which has been adopted is to form the necessary beam and stanchion treatment in reinforced concrete, and to build the wall screens in the panels in brickwork or other suitable material. With that, I think, my suggestions come to an end.

I can only hope by these few suggestions to have somewhat stimulated your interest in a very large subject. Little has, as yet, been done to demonstrate the æsthetic possibilities of reinforced concrete; but I hope when you have the opportunity of erecting buildings in this manner of construction, that you will do all you can to invent a suitable artistic treatment, and that it will not be allowed, either by architects or engineers, to be merely, a cheap and always ugly or else hidden, method of construction.

Discussion.

Mr. MATT. GARBUTT said he had great pleasure in proposing a hearty vote of thanks to Mr. Markham. The subject was a big one, and the paper was, he thought, a good attempt to solve the problem of treating reinforced concrete in an architectural manner. From the examples of buildings he had seen constructed in this material, he realised, as Mr. Markham had pointed out, the difficulties confronting the architect—as, for instance, the design of columns and members of that sort. The Corinthian column had been cited in the paper as an example, and certainly the elaborate capital of this column did not lend itself to the use of the necessary steel reinforcement. He had further noticed that ornament had the appearance of being stuck on, and of not forming an essential part of the design.

Mr. EDWIN O. SACHS expressed much pleasure in seconding the vote of thanks, and observed that he had come to learn, and had learnt. The point he would like to emphasise was that the time had arrived when it was really necessary for a society like the Architectural Association to include in its curriculum lectures upon reinforced concrete. He noticed a great tendency to the enumeration of various systems, and this he regretted. Could not the architect take up the design of buildings in reinforced concrete, without adopting any particular system? He was glad to hear that three of our chief railway companies were taking up reinforced concrete, but adhering to no specific system.

Mr. Statham, Mr. J. E. Franck, and Mr. Munby also joined in the discussion.

THE COMMONSENSE USE OF MATERIALS.

The first of a series of three lectures, arranged by the Worshipful Company of Carpenters, was delivered at the Carpenters' Hall, London Wall, on Wednesday, January 13th, by Mr. R. Weir Schultz. The subject was "Reason in Building, or the Common Sense Use of Materials." Mr. Schultz commenced his lecture by congratulating the master and court of the company on their enterprise in endeavouring to counteract the decadence of apprenticeship in the crafts. He remarked that it was very gratifying to note that the Worshipful Company of Carpenters, together with other City companies, had in the past, and still continued, to interest themselves in this matter, for the real solution of the problem must eventually come either through the crafts themselves or some organisation connected with them. Many of the City Guilds still took an interest in their own particular crafts, but, on the other hand. many have completely lost touch with the crafts to which they owe their origin; consequently other organisations have risen to take their places, namely, the trade unions. It is probable that in time to come these unions will make it a condition that before a man is admitted to full membership, he must show them that he has a complete knowledge of his craft, and then they will naturally wish to take a part in their training. The general opinion seems to be that apprenticeship is doomed, and the only substitute we have for this system is the technical schools. These schools have failings. They tend to make things too easy for the beginner, and so he grows up lacking initiative. Also the teachers at these schools, although originally craftsmen, are now frequently school-trained men with very little experience of trade conditions.

The lecturer proceeded to enumerate the best ways of gaining practical experience, namely, (1) studying the works and methods of old builders; (2) by learning from the old craftsmen, whenever possible; (3) by keeping one's eyes open and profiting by the experience of oneself and others.

The old craftsmen from most ancient times were trained under a system of apprenticeship, and this system is not yet entirely dead. He instanced country places where the craftsman still chooses his own materials and fashions them on the spot, but in very few cases do the younger generation follow the old tradition. The lecturer dealt briefly with the effect which machinery has had on the crafts, and looked forward to the time when by means of electric power, large factories would give place to small workshops, where work would be caried on under better conditions.

Touching on the study of the old builders, Mr. Schultz advised students to go to work in an intelligent manner, and to look below the surface for the reasons for doing things. Let them also bear in mind that this is of more importance than pretty sketches and even measured drawings.

Dealing with materials, the lecturer pointed out that in the past, owing to the difficulty of transit, the materials on the spot were invariably used, except in the case of large mansions, churches, etc. So in Somersetshire, and the Cotswolds, we find stone buildings with stone slated roofs. In the home counties, such as Kent, Surrey, and Hants, where bricks and timber abound, we find timber-framed and brick buildings with tiled roofs, while, again, in Herefordshire and Cheshire we find timber frames filled in with wattle and daub.

He contrasted these conditions with those existing at the present time, when, owing to the increased cheapness and facility of transit, it is often more economical to build in materials brought from a distance, than to use those in the neighbourhood. However, there is always a way out of a difficulty, and as far as possible, materials should be used that will harmonise with the buildings around. In districts where timber was plentiful, it was invariably used for the framing, the filling in varying with the locality, being in some cases brickwork, in others clay, etc.

Dealing with roof coverings, he remarked that thatch was general where grain was grown, or reeds or heather available. It had many advantages, and some obvious disadvantages, and its use nowadays is almost entirely prohibitive, owing to by-laws and insurance companies' regulations; consequently the art had practically died out.

The lecture was illustrated by a series of lantern slides showing various types of buildings constructed in local materials, and also a hall at Cardiff, built at a minimum cost by Mr. Schultz, with an open timber roof built up of timbers of the usual stock scantlings, obtained from a yard close by, and which demonstrated in a very decisive manner a commonsense form of construction, together with the use of the cheapest materials at hand.

Mr. R. Weir Schultz, F.R.I.B.A., at the commencement of the second lecture of his series, delivered at Carpenters' Hall, E.C., on Friday last, stated that he proposed to deal with the principal crafts connected with building, and to endeavour to explain how it is possible to use the materials connected with these crafts in an honest, simple, and straightforward manner. Nowadays, he regretted to say, materials were often used in a manner detrimental to the building, both as a work of art and as a good piece of construction. There is, he said, in the work of the day, a general note of self-conscious inefficiency. However, he added, much good work is still being done, but it is more or less exotic, and not truly representative. He was sorry to say that a great deal of this was due to the false position occupied by architects at the present day.

How can we expect satisfactory results, when young architects are trained in front of drawing-boards, in stuffy offices, out of all touch with practical work, except an occasional visit to a job? He noticed that some of the best architects in recent years had gone through the workshop, notably Mr. Bentley, the architect of the Roman Catholic Cathedral at Westminster. His work, he said, contained qualities, lacking in the work of those who had not the same knowledge of materials and construction. Take, for example, the young architect of the present day. He is taken straight from college or school, and put in the office of an architect in practice. Occasionall, he is taken or goes on to, a job, but he is seldom allowed to stay and see for himself how materials are used, and still less often does he take off his coat, and try to do something himself, if only to find out how difficult it is. Then, at the end of three or four years, he settles down to design buildings himself, and teach practical men how to do their work, for, after all, isn't the architect the boss?

Mr. Schultz recommended all who were interested in the way famous buildings were erected in the past, to read Professor Lethaby's delightful book, "Westminster Abbey and the King's Craftsmen: A Study of Mediæval Building."

Returning to the subject of architectural training, the lecturer remarked that he did not wish to imply that an architect should have no theoretical training. We are often told that he need only have a rudimentary knowledge of science; but, he said, the architect of the future will have to be, to a large extent, an engineer.

If a living type of architecture is to arise again, it must come from a reasonable and sound use of materials, the artistic part will take care of itself. A man, he said, need not be an artist to erect a beautiful building. If the construction is right, the art will come.

Mr. Schultz then briefly considered the various works which go to make up a satisfactory building. As to foundations, he said, many points called for consideration, of which the nature of the subsoil is the most important. A good gravel bottom, firm sand, or even hard earth present no very great difficulties, but rock means extra expense. He recommended, in the latter case, taking out the earth, should the rock be close to the surface, and levelling up with concrete, rather than cutting away the rock. Then by-laws must be considered. He instanced a case where an architect was building direct on rock, when the surveyor came round, with the result that the rock had to be cut away and a foot of concrete put in.

He next referred to the craft of the scaffolder. In the old days, this was a fine craft, and a building covered with good scaffolding was a fine sight, but nowadays, it is being supplanted by "Scotsmen," and we also get high art scaffolds, painted and decorated. In fact, he said, scaffolding is now very often designed by an engineer, and passed by a county council, naturally an expensive matter. The stadium, at the Franco-British Exhibition, Mr. Schultz referred to as a fine piece of straightforward construction, with no waste of materials.

Dealing with stone as a material, he advised first of all a visit to the quarry to see in what sizes it is got out, etc. Then, if it has been in use for some time, an inspection of buildings constructed with it, in order to note its weathering properties, etc. Great care must be taken to place the stone on its natural bed, otherwise it will flake off, and also allowance must be made for getting the water off cornices and mouldings by throating. The effect of weathering on the stone should be carefully noted. For example, take Portland stone. Where it is exposed to the weather, it goes a beautiful mellow white colour, as may be seen in the case of the towers of the city churches, and the upper part of St. Paul's Cathedral. Having dealt with the various ways of bedding stone in mortar, he warned his hearers against directly copying old buildings and the works of the old builders, which he described as "unintelligent archæology," but rather to look below the surface for their reasons for doing things. As to granite, it should be used in a simple straightforward way, and should not be cut too small, as it is naturally quarried in large blocks.

Marble, he said, was used by the Greeks as a constructive material, but by the Romans chiefly as applied decoration. They cut the marble into thin slabs, the ends at the corners always showing the thickness of the slabs, not, as is done to-day, mitred off. When using marble, he recommended a very careful selection, as marbles are often placed together which do not blend, and are not in sympathy with one another.

A large number of lantern slides were shown, accompanying the lecture, and illustrating the different kinds of construction, and also the excellent results which could be obtained by a judicious use of the materials of the localities in which the various buildings were situated.

"La Petite Bagneuse," by Rodin, is the title of a new marble that has been added to the already interesting group of sculpture at the International Exhibition in the New Gallery.

* * *

Books giving designs for monograms have hitherto been few and expensive. Some few years ago, Messrs. Jack issed a large collection designed by Mr. A. A. Turbayne, and a new edition of this work is now announced, at about an eighth of the original price. This will place a collection of the latest designs within the reach of the most modest purse, and should ensure a large sale amongst artists, designers, and draughtsmen of all kinds. The book, as regards contents, will be exactly as originally published.

* * *

Mr. Geo. Thompson informs us that he has been appointed Principal of the Toxteth Technical Institute, Liverpool, and that any letters or other correspondence should be sent either to that institution or to his private address, which will be 14, Ampthill Road, Liverpool.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Jan. 31	*SOUTH BANK - IN - NORMANBY. Town Hall, Council Offices, etc., for the Urban District Council. Particulars of the Clerk, Town Hall South Bank, S.O., Yorks.
Mar. 17	NEW OFFICES FOR THE STANLEY U.D.C., DURHAM. Cost £3,500. Premiums £30, £20 and £10. Conditions, etc., to be obtained from J. G. Ridley, Clerk to the Council, Stanley S,O., Co. Durham.
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days.
No date.	PONTARDAWE (WALES). Offices for the Guardians, in Holly Street. Premium £10 10s. The premium is offered by the Guardians "for plans with abridged specification, *which in their judgment* are best suited." Particulars and conditions from C B. Jenkins, Clerk, Herbert Chambers, Pontardawe, S.O., Glamorganshire.
No date.	BLACKBURN. The Blackburn Small Holdings and Allotments Committee have decided to invite architects and surveyors in the Borough to submit competitive plans for the laying-out of the estate at Oswaldtwistle, recently purchased for small holdings. Premiums of £25, £10, and £5 are offered.

**The R.I.B.A. Council has requested Members to refrain from competing.*

Carnegie Library, New Mills.

A decision has been arrived at by the New Mills District Council and the Free Library Committee as to the adoption of plans and the award of premiums for designs of the new free library which it is proposed to erect with Mr. Carnegie's gift of £2,000. Premiums had been offered for the first three designs, namely, £15, £10, and £5 respectively, and after much consideration the awards were made as follows:—1, Mr. R. B. Preston, Disley and Manchester; 2, Messrs. Butterworth and Duncan, Rochdale; 3, Messrs. Potts, Sons, and Hennings, Manchester. The designs of Mr. Preston were adopted.

Tynemouth Palace Competition.

The Tynemouth Aquarium and Winter Gardens, erected some years ago at a cost of £80,000, have again changed hands, and the new owners recently invited plans for the improvement of the building. The result has just been made known, the successful competitors being Messrs. Marshall and Tweedy, 17, Eldon Square, Newcastle and North Shields. Their scheme includes the erection of a large theatre and concert hall for 3,000 persons; a skating rink 70 yards long, and other items. Fibrous plaster ceilings and proscenium will take the place of the present glass roof and temporary stage curtain. The contracts for the work will shortly be placed, and, if possible, the opening will take place at Easter.

Concerning Competitions.

We have received the following letter anent our leader in the issue of January 13th:—There are one or two points in your leader on the above subject which are open to criticism. You admit that we cannot rely on an assessor to discriminate between the good and bad schemes submitted for his consideration and award. Surely merit alone should be the criterion, whether the work be that of the young and ambitious, or of men of known skill and experience. You suggest "limited competitions." These would result in still greater disaster to our English architecture for various reasons.

(1) You do not recognise the fact that all the men now in the front rank of the competition world were once tyros, unknown and inexperienced. They have profited by failure, and have learnt architecture in the hardest school of all—the competition field.

(2) If you limit competitions, how will the ranks be filled when the present well-known men retire? Will it be by examinations, or by private influence? The men whom you seek to shut out, the assistants and students of to-day, are the architects of the future. If you deprive them of the experience to be gained in competitions, twenty years hence there will be a greater dearth of good Architecture than there is at present.

(3) Much of the work done by young architects shows both skill and a thorough grasp of the subject, and compares favourably with that of the more experienced, but less scholarly practitioners. If experience must be added to scholarship, it can only be done by granting facilities which open competition afford. This fact is apparent in any show of competition drawings. You find a really good elevation thrown away on a half-worked-out plan. Of course, the scheme is useless, as the plan, though correct architecturally, does not comply with certain necessary conditions. These defects in planning can only be realised and remedied after many unsuccessful efforts by the author, whose mind becomes more technical, and his brain more facile, at planning under stated conditions, in a more masterly, architectural manner at every subsequent attempt.

(4) In a competition of any importance, only about 15 per cent. or 20 per cent. are in the running, and the assessor should have little difficulty in choosing these, if he is a man well versed in the principles which govern good planning and scholarly design, coupled with a complete knowledge of the requirements of the building, for which the competition was originated.

ICTINUS AND MNESICLES.

Berkshire County Council Offices, Reading.

A competition is to be instituted, limited to the architects in Berkshire, for new Council Offices, to be erected on the sites of Nos. 26, 28, and 30, the Forbury, Reading. The decision to proceed with the scheme was reached by the Council at their meeting on the 9th inst.

New Schools, Ilkeston.

Mr. Widdows, of Derby, the assessor in the competition for the proposed Hallcroft Schools, has selected the design submitted by Mr. H. Tatham Sudbury, of Ilkeston.

Whittingham Asylum, Preston.

The result of this competition reached us as we went to press:—

First: Messrs. Sykes and Evans, Manchester.

Second: Mr. Lodge.

Third: Messrs. Appleyard and Quiggin, Liverpool.

In the Tribunal of Appeal under the London Building Act, the vacancy caused by the death of Mr. E. A. Gruning has been filled by the appointment of Mr. John Slater, F.R.I.B.A.

* * *

Mr. W. S. Frith, sculptor, and Mr. F. Pearson, architect, have been commissioned to execute a memorial to be erected in Truro Cathedral in commemoration of three distinguished Cornishmen—Lord Godolphin, who was Lord High Treasurer under Queen Anne; Sir John Elliot, a notable Parliamentary leader in the time of Charles I.; and Sir William Molesworth, who was the first statesman to hold the office of Secretary of State for the Colonies. The memorial has been provided by public subscription.

THE FUNCTION OF COLOUR IN STREET ARCHITECTURE.

II.

By P. M. Stratton, A.R.I.B.A.

(Concluded fom page 6, No. 725.)

Most modern cities are entirely of mushroom growth, though sometimes sprung from the germ of an ancient foundation, whose building traditions they have cast aside; whilst in the seaports there is a strong cosmopolitan element. All resemble one another in being so vast in extent that the surrounding scenery is shut out. No background of wooded hills, barren mountains, or open downs can be seen from their streets; the only bit of nature that is visible is the streak of sky above. In such circumstances architecture need not be so restricted to the use of local material, as in the country towns and villages.

On the other hand, it is in cities that the architect meets with one of the greatest difficulties in the display of choice materials. I refer to the fog, soot, mist and smoke that at one moment entrance the artist and the next make him despair. Yet were London the most beautiful city ever built, no one would wish to dissipate utterly that atmosphere, which at present constitutes its charm. See it when the wind drops and the mist begins to gather round the buildings. The smoke drifts down into the street and lessens the sun's glare. Harsh outlines are softened, angles seem gently rounded off, crude contrasts of colour are blurred and reconciled, as it were by a wash of purple grey, over everything. But the air grows hourly thicker with fog and smuts, until all suggestion of the surroundings is blotted out. At last the rain clears the atmosphere. The sun comes out whilst the walls and roof are still dripping. Every building is seen through the iridescent hues of moisture held in the air, and the sun turns to crystal each drop of water hanging to cornice and sill. Down in the wet pavement are reflected the hues from buildings on its edge, the roadway borrows blue from the sky. They endure only for a quarter of an hour, these fairy colours, but long enough to bear inspiration for the architect to create others that will not fade so soon. Unhappily the surface of marble, the most precious of our materials, is soon destroyed by the acids of this same poetic city atmosphere. So in most of our streets it is useless to display such stone as that of Le Perucq of Jersey; green-grey it is, like the sea on a quiet cloudy day and mottled as if touched by a sudden breath of wind. Indeed, all marbles put me in mind at once of water, from the lustre and reflections of their polished surfaces, and the sides of rivers or a sea-front seem their natural places. This is, I think, the secret of the surpassing loveliness of Venice, that her walls harmonise perfectly with her waterways. Alabaster, pearly-tinted, and stained with brown, seems a treasure plundered from Neptune's palace.

Marble is not the the only material whose colour is destroyed by the city acids, for all the sandstones and limestones, with the exception of Portland, are veiled in soot within the space of a few years. Of course, the buildings near the parks, and those fronting the squares or a river are toned down rather than covered. Yet there remains the mass of a city, where offices are built up tier above tier, or the swarming human hives are erected. For the great thoroughfares and mean streets we must have recourse to materials which will stand the local murky climate; and glazed bricks, tiles, and terra-cotta will not only resist the acids of the atmosphere, but are capable of being washed and cleaned as often as need be. The chief reason for not employing them in our time is that they tend to make a building look common and reminiscent of lavatories and cheap bun shops. And also we have used glazed bricks of the crudest colours to build our shop fronts, in order to outdo in display the shop of our neighbour, who has only plain stone piers guarding his plate glass. A few architects have had the courage to use vitrified materials in a large way, and have created oases of gay and refreshing colour in the streets. Our gratitude is due as well to the craftsmen of the pottery factories, who have produced such glorious tints.

One glance at a house in Addison Road, Kensington, should convince sceptics that faience may be used without vulgarity. Here, on a base of common brown brickwork, stand white pilasters enclosing wall spaces of green bricks. Above the capitals rise white arches round rich blue walling, and bearing above them bands of pale green and white that are shadowed with a great projecting cornice. An attic runs round the house, a broad strip of blue glazed bricks cut up by white piers placed far apart, and helping to support another cornice to whose edge the green tiles come. All the constructive and enriched part of the design, piers and main arches and cornices, is of white faience, that not only emphasises the lines where the weight is borne, but shows to greatest advantage the rich modelling of capital and modillion and moulding. The plain spaces of walling are yet full of variety, the bricks not having all the same tone of green or blue, but light and dark mixed haphazard and without design. A delightful portico leads up to the house; the open part supported on unpolished columns, softly grey, which cut athwart the vivid greens of glazed tiles on the walled-in side.

Those of us who are enthusiasts for colour are apt to complain of the very small use made of glazed materials. Here, we say, are blues that will rival the peacock's plumage, or the sea, or the pale indigo of the evening sky. Here is red as deep and rich as the rose, or delicate as the eglantine; and the greens confuse us by the number of tints and tones. But, after all, it is as well to be cautious in the advance, so that failures in purity and harmony of colour may be the more likely to be avoided. It is the very variety of tones and tints that will constitute a great danger in the future; for a building that is a thing of beauty in a monotonous street, will look very different in chromatic surroundings. Hence we may prophesy discords and crude contrasts which the hand of time cannot heal. Our hope is that the planning and design of our streets will be under the control and subject to the advice of eminent and experienced architects, who will be able to blend the whole city together, even as nature brings all things into the scheme of her harmony.

Mosaic, too, has so far been little used in street architecture, and it is difficult to judge of its effect. There is, however, the small front of Pagani's restaurant, in Great Portland Street, London, which has been covered most delicately with light greens, yellows, and reds, and has the window openings defined by a line of blue. Panels of gold mosaic are set in various buildings in London, but I do not know one which looks well with brickwork. It should have more sympathy with marble or polished granite; and when once the surface was smudged and smeared with dirt and soot the gold might be subdued and soft, with high lights here and there where the sun caught it uncovered.

Such small necessities as knockers, locks, and hinges, will give piquancy to simple doors, by the contrast between their brightness and the dulness of the wood or paint. Copper surely is a material that may be used with good effect in city architecture, especially for domes and spires, harmonising so well as it does with the tender greys and blues of the English sky. Or if we prefer it, there is lead, not the modern material with all the silver washed out of it, but the lead as we see it on the roofs of Westminster Abbey and many another old building, where its silvery whiteness stands as a background to the dark stone pinnacles and parapets. Then the lead itself is capable of being endowed with as gorgeous colours as the craftsman can lay on.

Such, then, are the materials which may safely be displayed in the sootladen atmosphere of cities. Where clearer air prevails, it is still advisable to face most of the walling with bricks and stone rather than obtain large glazed surfaces each side of the street.

English architects, from the end of the fifteenth century, have been at the greatest pains to design harmoniously in brick and stone, with such success that this type of building expresses more than any the inherent geniality and homeliness of the English characer. In Tudor times, when brickwork was first widely used, it formed the mass of the wall, and possessed a decidedly purple tone, as that to the Gothic part of Hampton Court, and in the Cambridge streets, with patterns of black headers disposed in haphazard fashion. The window and door openings, also the copings and carving, were of stone of about the same tone as the brick, grey or brown in hue, so that there was little contrast between the two. And this quiet effect of colour seems to have been sought all through the war of styles during the reigns of Elizabeth and James. But as the architects of the Renaissance attained a fuller knowledge of the pure classical forms, they sought to express them by the vivid contrast of white stone against bright red brick, as in the garden fronts of Hampton Court Palace.

This tradition of red and white architecture has been handed down with little alteration to our own day, and the most successful modern buildings in London are erected in the style, such as New Scotland Yard, the offices of "County Life," in Covent Garden, and the Royal College of Science at Kensington. The only development which needs comment is the introtion of alternate bands of stone and brick, a new note entirely in accord with the general composition.

Granite is a truly noble substance for bases and plinths, whether red or grey in colour; Mount Sorrel setts are sometimes a mingling of the two tints, and form a pavement rich in hue, yet hard in tone. But it is misinterpreting the character of granite to lay it over softer-looking material, and, if polished, it should be used with marble rather than with soft-textured stone.

It is often difficult to catch the general tint of a stone building, and a surface that is yellow under the sun's rays turns to a green-grey as the clouds drift over. Broadly, it may be said that between the full red of Runcorn, the yellow of Ham Hill, and the blue of Pennant, there are all the indefinable colours that go to the making of an English sky.

There is also endless variety in the bricks that can be obtained even from one neighbourhood. At Highgate, in North London, the rubbers make a splash of light red over the windows, and an edging to the jambs, toothed into the main facework of rich purple that is laced with black pointing. A garden wall has the prevailing tint of brown, but is speckled and fretted with yellows and toned off to grey. The better class houses are maroon colour, the bricks being not all of the same tint, but full of variety, lightening to pink or taking a little soot from the atmosphere, and darkening to vandyke brown; and from unexpected places in this setting a few glazed headers shine.

Setting forth these materials, in joyful appreciation of the wealth of the earth, we may redeem the vast modern accumulations of factories, shops, and dwellings, and restore each into a city built at unity with itself, and developing an individuality and a character of its own. Then, in the busy centre, glazed walls will gleam through the smoke like chrysoprase and jasper, emerald and opal, jacinth and lapis layuli, whilst about them will stand the spires and towers, pure white, the sentinels of Heaven; round the wide parks and commons; lines of delicate stone will stretch tinged with yellow and grey, and flushed with the red of brickwork, mingled too with hues of serpentine granite and alabaster, with the polished marbles of Devon and Derbyshire, the precious stores of Carrara and Egypt, till the whole city will lie as a captured sunset above the sea.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

The querist's name and address must always be given, not necessarily for publication.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s., made payable to Technical Journals Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

Corporation Claim to Dedication of Land.

SCARBOROUGH. — "Lonkley" writes:— "Plans for the conversion of the front of the ground floor of a dwelling house into a shop have been deposited with the authorities, and have been disapproved owing to the fact that the owners will not enter into an agreement with the Corporation to dedicate to the public, the land hatched in on the plan and marked 'D.' The authorities will not give their consent to the plans, and say that if the building is erected it will come within section 156 of the Public Health Act. The house forms one of a terrace of dwelling houses with bay windows. All the adjoining houses are now converted into shops, and occupying the line of the former bay windows. The new portion is carried about twelve feet above the footpath, so that the outer wall of the first and second storeys remain as before. Please say whether the Corporation are within their rights?"

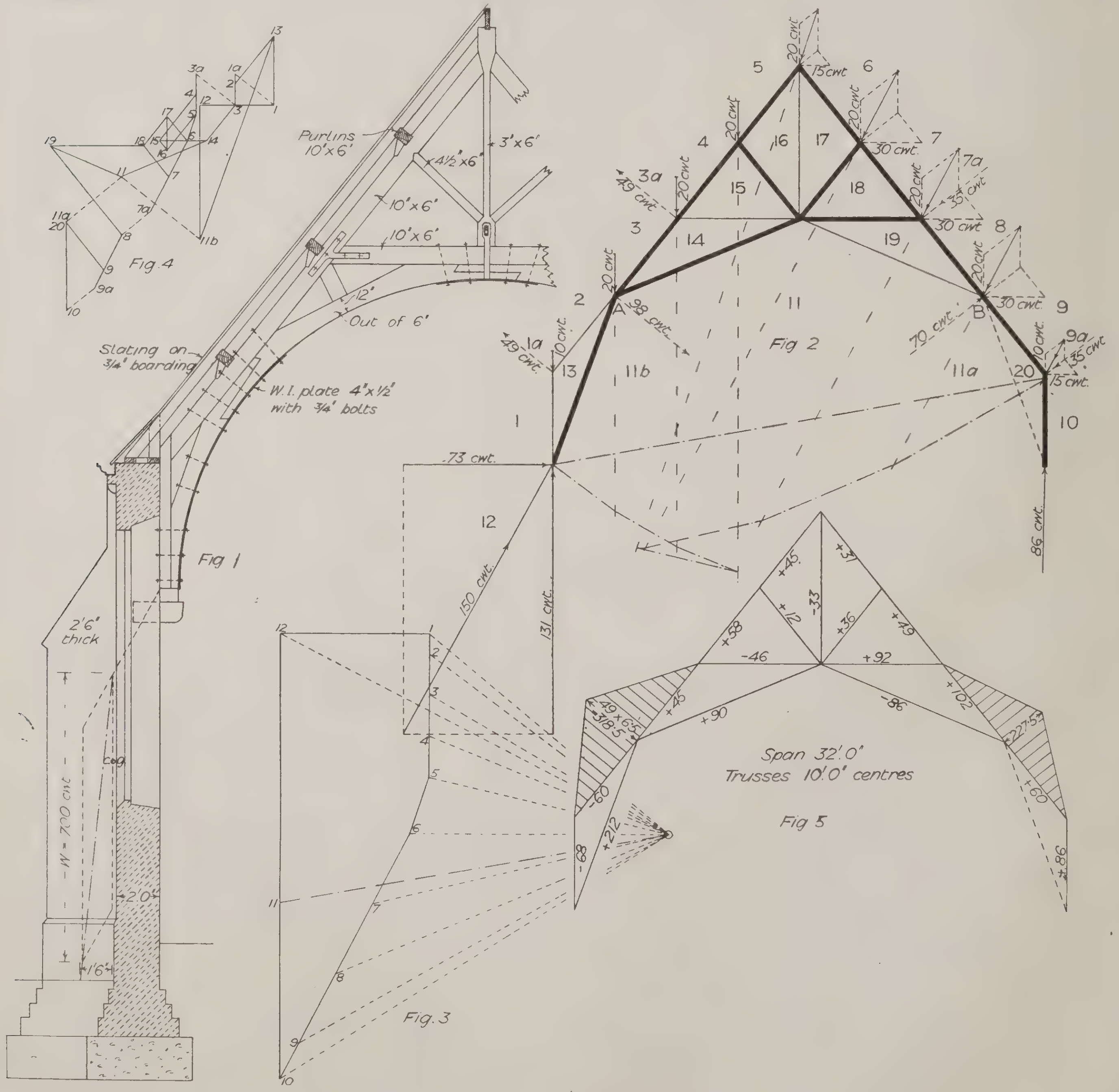
I am of opinion that the sanitary authority are wrong in refusing to pass the plans as you describe them, and that they have no legal right to enforce the bargain they suggest; although it certainly does appear to me that the owners would be well advised in dedicating the hatched strip of land, and so making the footway uniform and easy of access to their own premises, as well as for the use of the public generally. This strip can be of no possible use to the present owners, because they can never build upon it. The Local Improvement Act you quote does not apply to this case, because there is no question of a building line having been specially set out, nor has the question of purchase by the local authority arisen. The case certainly comes under section 3 of the Public Health Act, 1888, but (as I have always seen that section interpreted) this gives you the right to bring forward your building to the same frontage line as the properties on either side. Your remedy is to apply to the High Court for a "mandamus," but this involves costs, and I am bound to confess I think you will do better to accept the terms offered by the corporation.

F. S. I.

Design for Braced Collar Beam Roof.

DUBLIN.—"L.," writes:—"(1) I shall be obliged if you can inform me if there is any statical method by which the stresses in a roof of this type (sketch enclosed) [not reproduced], and the necessary buttress to resist same can be calculated? (1) Can the truss be taken as rigid and the buttress to resist the thrust of wind pressure only?"

The design for roof submitted is shown, with the necessary corrections, in Fig 1. The frame diagram will be as in Fig. 2, and taking the structural load at 28lbs. per ft. sup. and the horizontal wind pressure at 42lbs. per ft. sup., the loading will be as shown. Set down the load line in Fig. 3, and by means of a funicular polygon find the reactions, assuming that the whole of the horizontal thrust comes on the left-hand abutment. In order to work out the stress diagram virtual forces must be introduced as shown by the dotted lines in Fig. 2, being obtained by taking moments about points A and B, for example



ILLUSTRATING REPLY TO "ARCHITECT," DUBLIN.

$(131\times4)+(x\times6{\cdot}5)=(10\times4)+(73\times11)$, whence $6{\cdot}5x=319$ or $x=49$ cwt. and in order to preserve equilibrium, force 3—3*a* must be added, and force 11—11 lb. to balance the other two. The virtual forces on the other side may be worked out in a similar manner by taking moments about B, and it will then be found that the complete stress diagram, Fig. 4, may be easily constructed. The stresses should next be scaled off and marked on the outline diagram Fig. 5, together with the bending moments which take the place of the virtual forces in the actual truss. Considering the principal rafter at point A, the maximum compression will be 102cwts. and the bending moment 318.5 cwt.—ft., the full section at this point consisting of two 6in. by 10in. timbers, with a 4in. by ½in. plate bolted on. Then, allowing for the plate and deducting one ¾in. bolt hole, the distance of neutral axis from bottom of plate =

$$\frac{(52{\cdot}5\times15{\cdot}5)+(52{\cdot}5\times5{\cdot}5)+(30\times1{\cdot}625\times25)}{52{\cdot}5+52{\cdot}5+(30\times1{\cdot}625)}$$

$=7{\cdot}3$ in. Then $20{\cdot}5-7{\cdot}3=13{\cdot}2$, and $13{\cdot}2\times2=26{\cdot}4$, which may be taken as the virtual depth of section taken as timber only.
The maximum stresses will be

$$\frac{W}{A}\pm\frac{M}{Z}=\frac{102}{153{\cdot}75}+\frac{318{\cdot}5\times12}{\frac{1}{6}(6\times26{\cdot}4^2)}=0{\cdot}66+5.48=$$

6.14 cwt. per sq. in compression and 4.82 cwt. per sq. in tension. For the curved member, consisting of a 12in. by 6in. section, with a 4in. by ½in. plate, the distance of neutral axis from bottom of plate =

$$\frac{(63\times6{\cdot}5)+(30\times1{\cdot}625\times{\cdot}25)}{63+(30\times1{\cdot}62)}$$

$=3{\cdot}7$; $12{\cdot}5-3{\cdot}7=8{\cdot}8$ and $8{\cdot}8\times2=17.6$in. as the virtual depth of section. Then

$$\frac{W}{A}\pm\frac{M}{Z}=\frac{212}{111{\cdot}75}\pm\frac{212\times11{\cdot}5}{\frac{1}{6}(6\times17{\cdot}6^2)}=1.9\pm7{\cdot}9=$$

9.8 cwt. per sq. in. compression and 6 cwt. per sq. in. tension, which will be within safe limits. The other members will be as marked on Fig. 1. As the trusses are 12ft. centres, in finding the stability of the walls 6ft. run only should be taken as a maximum, to allow for window openings. Find the weight of wall and buttress and combine with the reaction on left-hand side of truss, giving the resultant which cuts the ground line at 1ft. 6in. from the centre of gravity of base. The section modulus of base will be

$$Z=\frac{(BD^2-bd^2)^2-4\,BD\,bd\,(D-d)^2}{6(BD^2-bd^2)}=\frac{(6\times5{\cdot}5^2-3{\cdot}5\times2{\cdot}5^2)^2-4\times6\times5{\cdot}5\times3{\cdot}5\times2{\cdot}5\times2^2}{6(6\times5{\cdot}5^2-3{\cdot}5\times2{\cdot}5^2)}$$

$=22$. Then $\frac{W}{A}\pm\frac{M}{Z}=\frac{700}{20{\cdot}75}\pm\frac{700\times1{\cdot}5}{22}=33.7\pm48=81{\cdot}7$ cwt. or 4.08 tons per sq. ft. compression, and 14.3cwt. or 0.71 tons per sq. ft. tension, so that the buttress will be sufficient.

HENRY ADAMS.

Walls for Swimming Pond.

CASTLEFORD.—"W. F. C." writes: "What thickness of brick wall is required for a swimming pond, size 75ft. by 30ft., water 6ft. 6in. deep at one end and 3ft. at the other? A passage surrounds the bath, the floor of bath being 1ft. above floor of passage at deepest end, and 4ft. 6in. at the other end? A smaller bath, size 28ft. by 14ft. and 2ft. 4in. by 3ft. deep is required, with passage as above, floor of pond being 5ft. above floor of passage. Can any formula be used for calculating the above? Would reinforced concrete be cheaper than brick, and whose system would you recommend? Can the walls be made water-tight without using special keyed brick linings and asphalte; can ordinary glazed bricks or tiles be used with safety? What thickness of concrete is required for the floors, and what thickness if reinforced, and how?"

Each foot run of the wall may be taken as a vertical girder resisting the thrust of earth and water, and supported at the ends. If the wall is built in brick-work set in 1 to 3 Portland cement mortar, with the facing bricks glazed, or of Portland cement concrete, 1 cement, 2 sand, 4 broken stone faced with glazed tiles, the thickness should be, say, 14 inches. The following method of working will give an approximate result by which the thickness is determined:—Fig. 1 shows the face of wall at the shallow end, where the water is 3ft. deep, and as this water will press down on the earth an amount of earth equivalent to this pressure must be assumed to be added to the wedge of earth already acting say, half the depth of the water. Then, assuming the natural slope at 40 degrees, the total thrust will be

$$T=\tfrac{1}{2}w\,h^2\tan^2\frac{90-\phi}{2}=\tfrac{1}{2}\times93{\cdot}75\times6^2\times{\cdot}4663^2$$

$=367$ lbs., and the ordinate at base of triangle of pressures $=\frac{367\times2}{6}=122$ lbs. The water pressure will be $\frac{1}{2}wh^2=\frac{1}{2}\times62{\cdot}5\times3^2=281$ lbs. and the ordinate at base of triangle of pressures $=\frac{281}{3}\times2=187{\cdot}5$ lbs. as shown in Fig. 1. The complete loading is shown in Fig. 2, and it should be divided up into any convenient number of parts, and the weight of each part found. Set down these loads as in Fig. 3, and select the pole O say 3ft. from the load line and draw vectors to the various points in the load line. Parallel to these vectors across their respective spaces draw the bending moment diagram, Fig. 4. The scale for the bending moments will be the load scale in lbs. per inch by distance from pole to load line in feet, which will give lb.—feet per inch, and the maximum bending moment may then be scaled off. The maximum allowable tensile stress on Portland cement mortar is 2 tons per sq. ft., then

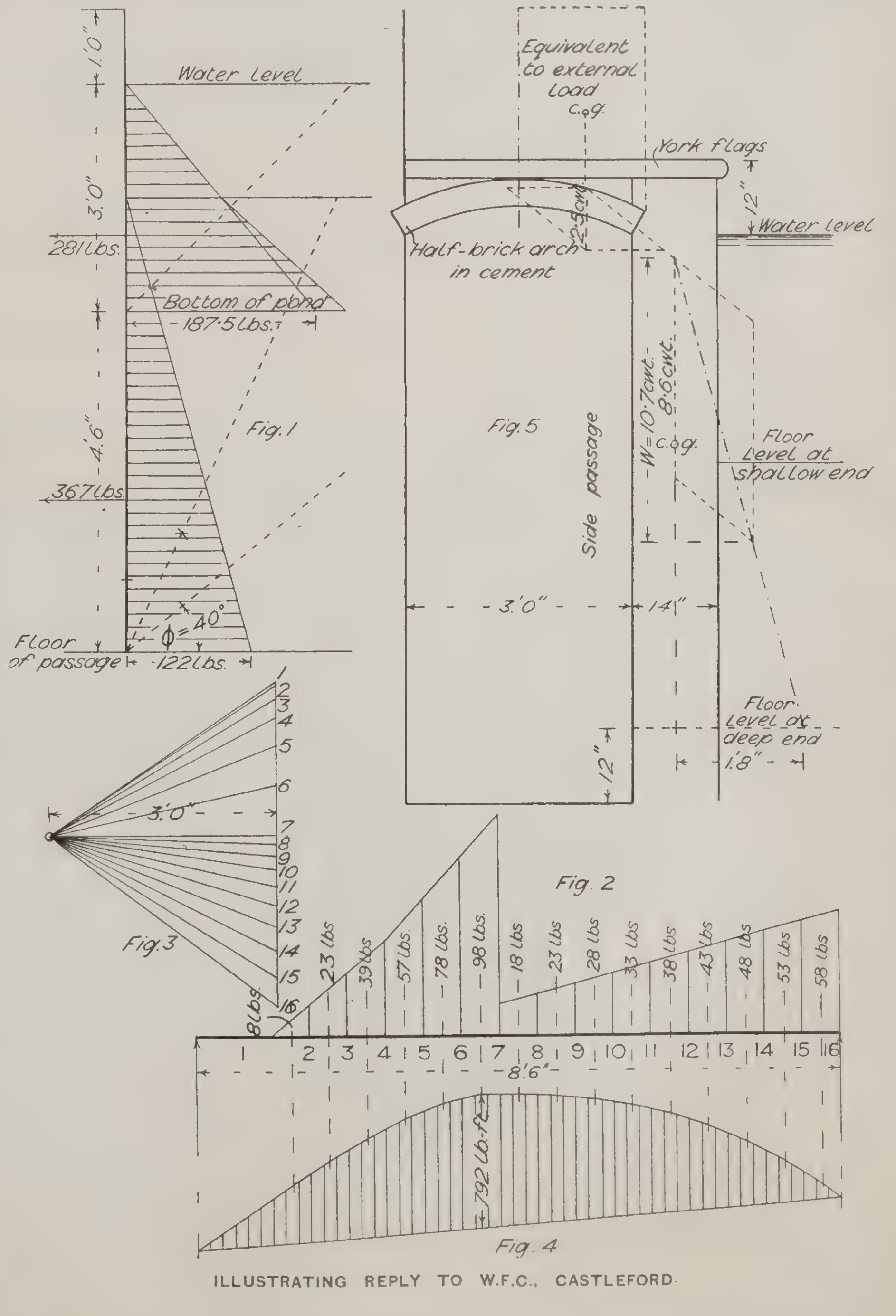
$\frac{M}{Z}=2$, or $\frac{M}{\frac{1}{6}(1\times d^2)}=2$, whence $M=\frac{1}{3}(1\times d^2)$,

$\frac{792}{2240}=\frac{1}{3}d^2$, whence $d^2=\frac{2376}{2240}$ or $d=\sqrt{1{\cdot}06}$ $=1{\cdot}03$ ft., say 14 in. wall.

The complete wall may now be drawn out as in Fig. 5 and the stability of wall against the pressure from arch when the bath is empty must be ascertained. Assume the external load at 1cwt. per ft. sup. and the structural load at ½cwt. per cub. ft., then by parallelogram of forces find the trusts at crown and springing. Combine the trust at springing with the weight of wall giving the resultant cutting the base at 1ft. 8in. from the centre of wall. Then

$$\frac{W}{A}\pm\frac{M}{Z}=\frac{10{\cdot}7}{1{\cdot}125}\pm\frac{107\times1{\cdot}66}{\frac{1}{6}(1\times1{\cdot}125^2)}=9{\cdot}5+84{\cdot}5=94$$

cwt. or 4·7 tons per sq. ft. compression, and 75cwt. or 3.75 tons per sq. ft. tension, at the deep end when the bath is empty. This is assuming that the arch consists of loose blocks, but the cohesion between the



ILLUSTRATING REPLY TO W.F.C., CASTLEFORD.

bricks would reduce the tensile stress to safe limits. If the passage is wider than 3ft., the stress will be greater, and then instead of arching it over, rolled joists must be used.

HENRY ADAMS.

Architects of Municipal Buildings and Town Halls.

DUDLEY.—"W. T." writes: "Please supply the names of about half a dozen architects who have lately won competitions for municipal buildings and town halls."

Town Halls, chiefly the result of competitions, have been recently opened or are in course of construction as follows:—(1) Chelsea, architect, Mr. Leonard Stokes; (2) Glamorgan County Hall, architects, Messrs. Harris and Moodie; (3) Holborn, architects, Messrs. Warwick and Hall; (4) Radcliffe, architects, Messrs. Gillow and Holt; (5) Shoreditch, architect, Mr. A. W. S. Cross, M.A.; (6) Stockport, architect, Sir Brumwell Thomas.

Books for Intermediate Examination.—R.I.B.A.

CUMBERLAND.—"W. W. B." writes: "Seeking books to study for the Intermediate Examination of the R.I.B.A., I have had offered secondhand Anderson's "Architecture of Greece and Rome" for 10s. It is 1st edition, 1902. The 2nd edition costs 18s. new. Which do you advise? Blomfield's "History of the Renaissance in England," 2 volumes, is offered for 35s. These are £2 10s. new. I can get an abridged edition, new, for 7s. 6d. Would buying "Practical Plane and Solid Geometry, including Graphic Statics," by J. Harrison, at 3s. 6d., be as suitable as Angel's Geometry at 5s., and Hardy's Graphic Statics, at 3s. I also need Bond's "Gothic in England," 31s. 6d.; Anderson's "Arch. Renaissance in Italy," 12s. 6d.; and Fletcher's History of Architecture," 21s.; and Farrow's "Stresses and Strains," 5s.; Gotch's "Early Renaissance in England," 21s. These are expensive books, and I should have liked to get them second-hand; but I should prefer to spend rather more and get the proper thing than to get the cheaper article now and be bound to get the others later."

The opinion expressed by our correspondent at the end of his letter is to be strongly endorsed, viz., that it is "better to spend a larger sum and to get the proper thing"; and our advice would also include a rider to this axiom—it is better, when buying books for the intermediate examination, to consider, not only the final examination, but also the value of having good books at hand for future reference. Hence we should give preference to the latest edition of Anderson and Spiers' "Greece and Rome" (though the earlier edition is, perhaps, as satisfactory for use for the intermediate examination). Also to the larger edition of Blomfield's "Renaissance in England," at 35s., as the illustrations will be found more satisfactory. It is not necessary to have a large book on geometry; Harrison's will, we believe, be found quite satisfactory. Anderson's "Italian Renaissance" should certainly be acquired, but it is at the moment out of print, and it would be well to await a new edition. "Gothic Architecture," by Francis Bond, is well worth buying as a valuable book of reference. "Fletcher's History" is a most useful text book; we doubt whether either of these last two is obtainable second-hand, except by chance (the earlier editions of the "Fletcher's History" are hardly to be recommended). The other three books mentioned will be found useful. The best plan is, however, to keep a list of books to be bought, and to buy only as found necessary or as opportunity offers.

B. AND B.

Constructing a Baker's Oven.

LONDON, W.C.—"Zero" writes:—Will you be good enough to tell me how a baker's brick oven is constructed? The plan is circular. I want a section to show flue and construction of fire beneath, with height from floor, etc. Please also state what iron fittings are necessary."

The ordinary cottage oven for baking consists merely of a closed chamber paved and domed in brick. There is an open flue immediately over the opening to take the smoke, which would otherwise come straight out of the door into the room. This flue connects with the main chimney flue higher up, and there are no special details necessary beyond the provision of a sufficient draught to cause the smoke to travel up the flue. The only iron fittings consist of a flat plate furnished with handles for removing it. It merely rests against the framing, and is not hinged or fastened—unless, indeed, there be lugs to keep it securely in its position in the throat of the oven mouth."

F. S. I.

County Council Valuer.

SHREWSBURY.—"X. Y. Z." writes:—"Please give detailed particulars of the duties devolving upon a valuer appointed by a county council under the Finance Act."

I am not aware of any valuer who is appointed by a County Council under the Finance Acts. Are you referring to the valuers who are appointed under the Small Holdings and Allotments Act, 1907? These gentlemen are nominated by a county council, and their duties are laid down by the council appointing them. Speaking generally, those duties are to enquire into any applications which are made for small holdings, to enquire as to what lands are available, by private treaty or otherwise, to meet those demands, and subsequently to hold enquiries on the spot if it be necessary for the county to rent or purchase land.

F. S. I.

Floor for a Roller Skating Ring.

LIMPSFIELD, SURREY.—"Abingdon" writes: "Referring to 'Experience's' letter in your issue of January 13th, permit me to say, as an old roller skater, that the floor of the immediate future will be a resilient one, such as the subject of a recent patent, whereby the floor, constructed of oak or maple boarding on timber joists, is carried upon lines of light steel girders in short lengths, supported on steel spiral springs. The whole floor is thus held in suspension, and 'gives' to the movement of the skater instead of resisting his power."

Liability of Sub-contractors.

BEDFORDSHIRE.—"Granite" writes:—"I shall esteem it a great favour if you can inform me whether a sub-contractor is liable under the Workmen's Compensation Act to compensate any of his men who may meet with an accident during employment? The sub-contractor whom I am alluding to is a master plasterer, and in his system of contracting he only supplies 'labour,' not materials, which are, as customary in this district, provided by the builder. The legal point of the question is so complex, yet very interesting, and also one of great importance, that your answer will be looked for with great interest, both by myself and others of the building trades."

Certainly the sub-contractor is legally liable to compensate any of his men who meet with accidents while in his employ, but the workman has also a legal claim against the principal contractor also, this provision, no doubt, being intended to protect the workmen against "men of straw" as sub-contractors. Clause 4 of the Workmen's Compensation Act, 1906, reads:—"(1) Where any person (in this section referred to as the principal), in the course of or for the purposes of his trade or business, contracts with any other person (in this section referred to as the contractor) for the execution by or under the contractor of the whole or any part of any work undertaken by the principal, the principal shall be liable to pay to any workman employed in the execution of the work any compensation under this Act which he would have been liable to pay if that workman had been immediately employed by him; and where compensation is claimed from or proceedings are taken against the principal, then, in the application of this Act, references to the principal shall be substituted for references to the employer, except that the amount of compensation shall be calculated with reference to the earnings of the workman under the employer by whom he is immediately employed. Provided that, where the contract relates to threshing, ploughing, or other agricultural work, and the contractor provides and uses machinery driven by mechanical power for the purpose of such work, he and he alone shall be liable under this Act to pay compensation to any workmen employed by him on such work. (2) Where the principal is liable to pay compensation under this section, he shall be entitled to be indemnified by any person who would have been liable to pay compensation to the workman independently of this section, and all questions as to the right to and amount of any such indemnity shall in default of agreement be settled by arbitration under this Act. (3) Nothing in this section shall be construed as preventing a workman recovering compensation under this Act from the contractor instead of the principal. (4) This section shall not apply in any case where the accident occurred elsewhere than on, or in, or about premises on which the principal has undertaken to execute the work or which are otherwise under his control or management." You may purchase the Act itself for threepence.

F. S. I.

Smoky Chimney.

CARNARVON.—"L. L. J." writes: "A client has had a house built by a contractor under my supervision. A clause of the contract provides for the remedying of any defect that might become apparent in three months after completion. Five flues are carried up in an outside gable wall, three from the ground floor and two from the first floor. The wall is of stone, plastered on the inside and cemented on the outside. When a fire is lit in the scullery the bedroom above is filled with smoke, but we have failed to find from where it comes. When the parlour fire is lit the smoke comes from under the scullery boiler flue. All the flues are far apart until they are gathered to the stack. Other flues (four) in the other gable give no trouble, and I cannot suggest jerry building. The nuisance is at its worst on calm days, and when there's a breeze the trouble does not make itself apparent. The open fire of the scullery suffers from down draught occasionally. The pots are ordinary tall round pots. The building stands on clear ground, with two or three trees some forty feet away. Can you suggest what is the cause of the mischief? Is it right to hold the contractor liable to remedy the mischief? Can my client compel the contractor to open to and examine the flues"

We cannot see that there can be any other cause for the trouble you mention than some defect in the flues, and this may be due to want of proper workmanship in building flue partitions, i.e., the joints in the stonework are not properly filled up, and, further, that it is probable the flues have not been properly pargetted. If the flues were carried up and were perfectly smoke-tight, there could not possibly be any leakage from one room to another. Possibly the trouble is due to defects in covering over the chimney openings. This, however, would not seem to apply in the case of the parlour fireplace, as the difficulty there must be somewhere close to the ground level. The question of down draught in the scullery might be cured by one of the many patent anti-down draught chimney-pots, and we presume that the chimney from this is of the same height as the others. The "Edwardian" pot of Messrs. Homan and Rodgers has proved very efficacious in dealing with down draughts. This is an ordinary terra-cotta pot. If your contractor is liable for defects under the term of his contract, we certainly think you can compel him to open up the flues of likely places and examine them for defects.

THE STABILITY OF WALLS.*

By Henry Adams, M.Inst.C.E., etc., Member of Council, The Society of Architects.

In order to bring the subject of stability of walls within the limits of time permissible in a single evening it is proposed to deal only with one class of walls, viz., those known as boundary, enclosure, or fence walls, which have no load but their own weight to support, and no thrust but that produced by the wind to resist. They are not of great importance in themselves, but they will serve as a medium for the introduction of the general principles of determining stability, and save our time when we consider more important cases on a future occasion.

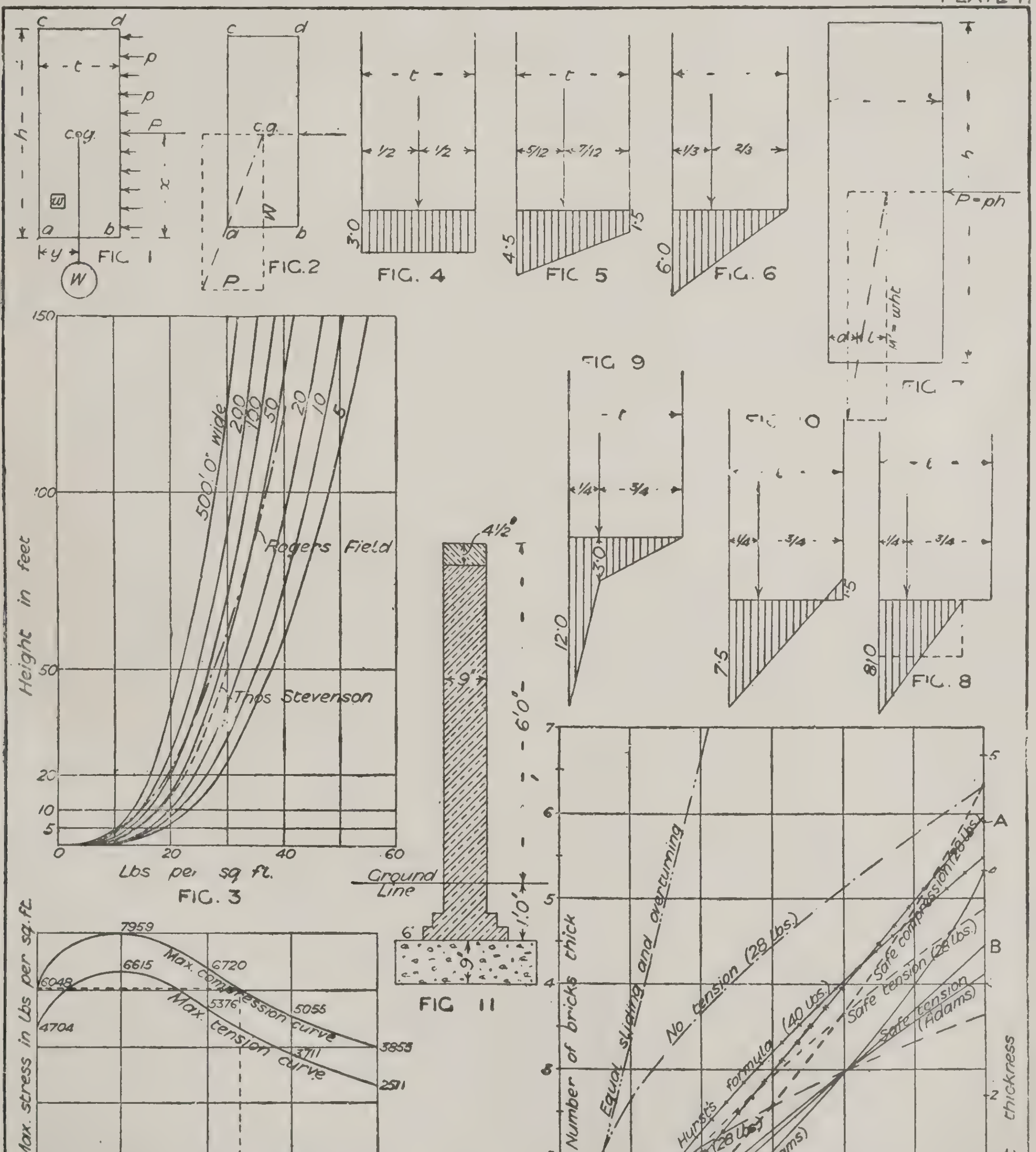
The Main Principle.

By making one or two assumptions the main principle can be shown very easily, but in the application of this principle to practice there are various points open to discussion, and the actual stability is by no means so certain as might generally be supposed. To make the subject perfectly clear, we will commence with a simple wall of uniform rectangular section, assuming that the wind is blowing horizontally and uniformly over one face, that there is no tensile strength in the mortar, and that the wall would ultimately fail by overturning on the outer edge at the ground line without crushing the edge.

Let a b c d (Fig. 1) be the section of wall, and as the reasoning that applies to one foot of its length applies to every foot, it will be convenient to consider a length of 1ft. run. Then the total force of the wind will be the pressure per sq. ft. by no. of sq. ft. (i.e., the height, because we are only considering 1ft. of the length), and the centre of action will clearly be at half the height, the leverage to overturn the wall on point a will thus be x. It is not the distance measured from the point of P diagonally down to point a, because the leverage of any force must be measured from the fulcrum perpendicularly to the direction of the force. The wall being of uniform substance and rectangular in section, the centre of figure will be the position of the centre of gravity, marked c.g., where the whole weight may be considered as acting. This weight W is the weight per cubic foot by no. of cub. ft. (i.e., the height by the thickness, the length

PAPER ON STABILITY OF WALLS.

PLATE I.



---

*Substance of a paper read by Prof. Henry Adams, M.Inst.C.E., etc., before the Society of Architects, on January 14th.

being 1 foot), and its leverage, resisting the overturning on a, will be y. It is assumed that there is no tensile strength at point b to hold the inner edge down, as when the wall is new the cohesion of the mortar cannot be relied upon.

Let p = wind pressure per sq. ft. in lbs.
w = weight per cub. ft. of wall in lbs.
h = height of wall in feet.
t = thickness of wall in feet.
P = total wind pressure in lbs.
W = total weight or resistance in lbs.
x = leverage of wind in feet.
y = leverage of resistance in feet.

then

$P = p\,h$, $x = \frac{1}{2}h$, Px = moment of wind pressure,
$W = w\,h\,t$, $y = \frac{1}{2}t$, Wy = moment of resistance,

and by the laws of equilibrium $P\,x = W\,y$, therefore

$$p\,h \times \tfrac{1}{2}h = w\,h\,t \times \tfrac{1}{2}t, \text{ or } p\,h^2 = w\,t^2,$$

whence

$$p = \frac{wt^2}{h} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

$$h = \frac{wt^2}{p} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

$$t = \sqrt{\frac{ph}{w}} \quad \ldots\ldots\ldots\ldots\ldots \quad (3)$$

If we consider the wind pressure which will just overturn the wall as the measure of stability, then the stability of such a wall varies as $\frac{wt^2}{h}$, or directly as the weight per cube foot, inversely as the height, and directly as the square of the thickness.

Parallelogram of Forces.

This may be shown by parallelogram of forces as in Fig. 2. Draw to any scale the outline of section *a b c d*, and mark the position of centre of gravity; draw a line vertically through the centre of gravity equal in length to the total weight W upon any given scale, measuring from the line of direction of the resultant of the wind pressure, which in this case will pass through the centre of gravity of the wall; at its extremity draw a horizontal line of indefinite length, then from the centre of gravity draw a line through point a to cut the horizontal line, and P will be the total wind force, or $\frac{P}{h}$ the wind force per sq. ft. to just overturn the wall. The other lines forming the parallelogram, and shown dotted, are frequently omitted.

Suppose a standard be taken of 112lbs. per cub. ft. for weight and 28lbs. per sq. ft. for wind pressure, then by formula (2) for simple overturning, a wall

1ft. thick would be 4ft. high.
2ft. thick would be 16ft. high.
3ft. thick would be 36ft. high.

or the height of any wall would be 4 times the square of the thickness . . . . . (4) which for various reasons would not accord with practice.

Resistance to Sliding.

There is another contingency which is theoretically possible, viz., that the wall instead of overturning, may slide on the bed joint. The resistance to sliding depends upon the weight and the nature of the surfaces in contact; it is directly proportional to the weight multiplied by a fraction called the "co-efficient of friction," varying with the surface. If the mortar has any cohesive strength this co-efficient of friction would merge into the resistance of the mortar to shear stress.

Let μ = the co-efficient of friction, then for equilibrium $P = W\mu$, or $p\,h = w\,h\,t\mu$, whence $p = w\,t\mu$ . . . . (5)
It is evident that there must be a certain proportion of thickness to height where the tendency to overturn or slide would be equal; this will be when $\frac{wt^2}{h}\,(1) = wt\mu(4)$,

or, by cancelling, when $\frac{t}{h} = \mu$ . . . . . (6)

that is, when the ratio of thickness to height is equal to the co-efficient of friction, and this being 0.5 for fresh mortar, it would require the wall to be only twice the thickness high.

Basis of Practical Calculations.

Now, unfortunately, when we come to apply these elementary principles to practice, we are beset by difficulties on every hand, and although an architect's innate sense of fitness may enable him to provide a suitable section for a wall of any height there are times when he should be able to give a reason "for the faith that is in him," and to do so it will be necessary to make various digressions to ascertain the basis upon which practical calculations must rest.

Walls have been designed so that the overturning moment shall not exceed one-half to two-thirds that which calculation would show to be necessary to produce overturning, but this is a very crude and improper mode of designing, and the author will now endeavour to indicate the true basis upon which it should proceed.

Strength and Weight of Materials.

These will vary considerably according to individual samples, but an average may be taken as follows:—

Material.	Safe dead load per ft. sup.	Factor of Safety.	Weight in lbs. per cub. ft.
Granite masonry	15 ...	20 ...	160
Portland and hard limestone	15 ...	15 ...	140
Sandstone well bedded	12 ...	10 ...	130
Blue brick in cement ...	9 ...	8 ...	120
Stock brick in cement	6 ...	5 ...	115
Ditto in Lias mortar...	5 ...	4 ...	112
Ditto grey lime mortar	3 ...	4 ...	112
Portland cement concrete	5 ...	8 ...	130
Lias lime concrete	3 ...	8 ...	120
Gravel and natural compact earth	2 ...	— ...	112
Made ground rammed in layers	1 ...	— ...	110

The safe compressive loads given above vary from one-fourth to one-hundredth of the ultimate resistance: the factor of safety is calculated from the load at which fracture commences. It is necessary to allow a large margin for contingencies, and the figures named agree fairly with ordinary practice.

Strength of Mortar.

The safe tensile strength of old grey lime mortar may be taken at 1 ton per sq. ft. the co-efficient of friction, including resistance to shear, in fresh mortar joints according to different authorities = 0.5 to 0.75 of the load. The shearing strength of old mortar may be taken at two-thirds ton per sq. ft. The author of "Notes on Building Construction" gives the safe tensile strength as follows:—

	Per sq. in.	Per sq. ft.
Brickwork in cement fresh	0·5 cwt. =	3·6 tons.
,, ,, 6 months old ...	2 cwt. =	14·4 ,,
,, lias lime, fresh	0.1 cwt. =	0.72 ,,
,, ,, 6 months old ...	36 lbs. =	2.314 ,,

A maximum pressure of 10 tons per sq. ft. is sometimes allowed on brickwork at the overturning edge, but it must be remembered that crushing may commence with this pressure.

Clay as a Foundation.

No mention has been made of clay as a foundation, as no single figure can express its value; very much depends upon circumstances. In deep foundations, say exceeding 10ft. from surface, the London clay will bear 5 tons per foot super. safely. In shallow foundations a pressure of 1½ tons per foot super. would be reasonable, but in such a case it is not compression of the subsoil that is to be feared; the alternations of drought and moisture cause alternate contraction and expansion of the clay, and a movement of the superstructure is certain to follow, unless special precautions have been taken, more particularly where the surface is sloping, as on a hill-side.

Wind Pressure.

The pressure of wind against a plane surface perpendicular to its direction is not yet fully understood. It is, of course, a product of the velocity, but it varies according to laws which have not yet been reduced to correct formulæ, even if it be possible ever to arrive at more than a vague generalization. From the experiments which have been made, it appears that surfaces of a few feet area give a greater resistance per unit of area than smaller surfaces, and that very large surfaces are never subject to a uniform pressure over their whole area, so that the mean pressure is again reduced. It has been generally assumed that the force varies as the square of the velocity, and that the effect depends solely upon the area of the resisting plane. Pressures equivalent to 60lbs. and even 80lbs. per sq. ft. have been recorded in England, but 56lbs. is probably ample to allow for under any circumstances, and it is doubtful whether this has ever been actually reached. Half this amount, or 28lbs. per sq. ft., is enough to allow in rough calculations for boundary walls and similar structures near the ground level, unless in an unusually exposed situation.

The following table shows the average classification of wind force collated from various sources:—

Average Classification of Wind Force.

Description,	Velocity in miles per hour.	Approximate corresponding pressure lbs. per sq. ft.
Barely perceptible wind ..	$2\frac{1}{2}$	$\frac{1}{32}$
Light breeze	5	$\frac{1}{8}$
Pleasant breeze	$7\frac{1}{2}$	$\frac{1}{4}$
Good breeze	10	$\frac{1}{2}$
Strong breeze	15	$1\frac{1}{8}$
High wind	20	2
Half gale	30	$4\frac{1}{2}$
Strong gale	40	8
Whole gale	50	$12\frac{1}{2}$
Great storm	60	18
Hurricane	80	32
Violent hurricane	100	50

By Smeaton's formula, $p = \frac{v \text{ miles per hour}}{200}$

The pressures given in this table, although usually accepted, are only approximately correct, as at and near the critcal point of, say, 1,100ft. per sec., the resistance is in a much higher ratio than v^2 while below 100ft. per sec., it is more nearly as the velocity simply.

Empirical Formula for Wind Pressure.

The author has given considerable attention to the subject of wind pressure, and its modification according to the width and height of the surface exposed to its force. He has constructed the following empirical formula for practical use where it is desirable to obtain the closest approximation to actual conditions, viz.:—

$$\log p = 1{\cdot}125 + 0{\cdot}32 \log g - 0{\cdot}12 \log l \quad (7)$$

where p = ultimate wind pressure in lbs. per sq. ft. necessary to be allowed for against a plane surface perpendicular to the direction of the wind.
g = height of centre of gravity of surface considered, above ground level in feet.
l = width in feet of part to be taken as one surface.

This would give allowances as in the following table, for which the curves are plotted in Fig. 3:—

Wind Pressure lbs. per sq. ft. on Plane Surface.

Height in feet.	Length in feet.						
	5	10	20	50	100	200	500
150	54.6	50.3	46.3	41 4	38.1	35.1	31.4
100	48.0	44.2	40.7	36 4	33.5	30.8	27.6
50	38.4	35.4	32 5	29.1	26.8	24.7	22.1
20	28.7	26.4	24.3	21.7	20.0	18.4	16.5
10	23.0	21.1	19.5	17.4	16.0	14.8	13.2
5	18.4	17.0	15.6	13.9	12.8	11.8	10.6

(For very exposed positions 25 per cent. may be added.)

For additional notes on wind pressure by the present writer, reference may be made to his papers, "Wind Pressure on Roofs," read before the Society of Architects in 1893, and "The Force of the Wind," read before the City of London College Science Society in 1895. Reference may also be usefully made to a Report by the Director of the Meteorological Office, Official No. 180, entitled "The Beaufort Scale of Wind Force," 1906.

Combination of Weight and Wind Pressure.

The weight of a plain wall of rectangular section produces a uniformly distributed load over the base, and a horizontal wind blowing against it adds nothing to the weight, but throws the resultant of the forces over to the leeward side and alters the distribution of the loading, reducing it on the side next the wind, and increasing it to a similar extent on the opposite side, so that the sum total of the reactions remains the same. Fig. 4 shows the reaction when the resultant is in the centre, Fig. 5, when it has been forced out of the centre, but not so far as the middle third, and Fig. 6 when it just reaches the limit of the middle third. At this point, it will be seen that the pressure is reduced to nothing on the inside and increased to double the mean on the outside. It is generally stated that this position of the resultant is the limit for safety, but it is an incorrect expression to use. The limit of the middle third only signifies that there will be no tension on the inner edge, the compression on the outer edge will vary according to the load, and may exceed the limit of safety. On the other hand, the middle third may often be passed without exceeding the limit of safety. Adopting the notation already given, the weight of the wall will be $W = w\ h\ t$, and the area of base for 1ft. run $A = t \times 1$, the mean pressure on the base will then be

$$\frac{W}{A} = \frac{wht}{t}\ w\,h \ldots\ldots\ldots\ldots\ldots\ldots (8)$$

and the maximum pressure when the resultant is at the edge of middle third

$$\frac{2W}{A} = 2\,w\,h \ldots\ldots\ldots\ldots\ldots\ldots\ldots (9)$$

The position of the resultant will be found by reference to Fig. 7 where $w\ h\ t : p\ h :: \frac{1}{2}h : l$,

$$\text{whence } l = \frac{ph \times \frac{1}{2}h}{wht} = \frac{1}{2}\frac{ph}{wt} \ldots\ldots\ldots\ldots (10)$$

$$\text{and } d = \frac{1}{2}\frac{ph}{wt} - \frac{1}{2}t = \frac{1}{2}\left(\frac{ph}{wt} - t\right), \ldots\ldots (11)$$

By the same figure it will be observed that when the resultant is pushed over to the edge of the middle third $p\,h : w\,h\,t :: \frac{1}{6}\,t : \frac{1}{2}\,h$ whence

$$p = \frac{wt^2}{3h} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (12)$$

When the wind pressure is sufficient to cause the resultant to cut the base beyond the middle third there are two possible conditions, (a) owing to freshness of the work no tension is allowable on inner edge, (b) matured work permitting tension on inner edge. In the first condition, of no tension, the generally accepted theory is due to Prof. Crofton, of the Royal Military Academy, Woolwich, and is shown in Fig. 8. The base of the parallelogram of mean pressure and triangle of reactions, is set out three times the length of the distance from the resultant to the overturning edge; the depth of parallelogram is made equal to the mean pressure on the base supposing only that portion of the thickness effective, and the depth of triangle will be double the parallelogram. From this it results that the maximum pressure at outer edge will be

$$\frac{W}{3} \times 2 = \frac{2}{3} \times \frac{W}{d} \ldots\ldots\ldots\ldots\ldots\ldots (13)$$

Now the author finds some difficulty in accepting this theory, it appears to him reasonable that, as the base may be looked upon as a rigid body resting on a plane, the pressure might be divided in some way over the whole area, and he finds that Fig. 9 complies with all the theoretical tests he has been able to bring to bear upon it, and he offers this as an alternative to Prof. Crofton's theory. If it be the correct view it is important to give it due consideration, as the maximum pressure shown by it is greater than by the ordinary method. The maximum pressure K and the pressure directly under the resultant R, are given by the following formulæ:—

$$K = W\left(\frac{2}{d} - \frac{4}{t}\right) \ldots\ldots\ldots\ldots\ldots\ldots (14)$$

$$R = W\left(\frac{4d}{t^2}\right) \ldots\ldots\ldots\ldots\ldots\ldots (15)$$

In the second possible condition, of the work being sufficiently mature to permit the mortar to resist tension on the inner edge, the ordinary formula for combining a longitudinal and transverse load, or direct load and bending moment, may be adopted, viz.:

$$S = \frac{W}{A} \pm \frac{M}{Z} \ldots\ldots\ldots\ldots\ldots\ldots (16)$$

where S = stress in lbs. per sq. ft. at the edges, the + value being for compression side and − value for the tension side.

M = bending moment in pound-feet.

Z = modulus of section,* in foot units = $\frac{1}{6}\,t^2$ for 1 ft. run of wall, or $\frac{1}{6}\,b\,h^2$ for any other rectangular section.

This will give reactions as in Fig. 10, and it is worth noting that whether the resultant is pushed over to the given position by wind pressure, or is there by reason of a direct vertical non-axial load, the resulting stress is the same.

Or, for 1ft. run of a plain rectangular wall, the equation (16) may be conveniently given in the form

$$S = w\,h + \frac{3ph^2}{t^2} \ldots\ldots\ldots\ldots\ldots\ldots (17)$$

Or by transposition

$$\text{for compression } t = \sqrt{\frac{3ph^2}{S_c - wh}} \ldots\ldots\ldots\ldots (18)$$

$$\text{for tension } t = \sqrt{\frac{3ph^2}{S_t + wh}} \ldots\ldots\ldots\ldots (19)$$

---

*This section modulus Z is sometimes wrongly called moment of resistance, as for instance in catalogues of rolled joists where it appears as "moment of resistance in square inches."

(To be concluded.)

Trade and Craft.

Hopton Wood Stone.

"Some Geological Facts concerning Hopton Wood Stone," are given in a neat pamphlet that has been issued by the Hopton-Wood Stone Firms, Ltd., whose London office is at 134, Cheapside, E.C. The firm's offices and works are at Wirksworth, and their quarries are at Hopton, Middleton, Middle Peak, and Coal Hills, Derbyshire.

A very interesting account of the natural processes by which the stone has acquired its characteristic qualities and appearance is supplied by the Rev. E. C. Spicer, M.A., F.G.S., who is a University Extension lecturer on geology. A layer of igneous rock is interstratified with the limestone. "The limestone above this igneous band is unaltered. The limestone below it is altered in a remarkable degree. . . To understand this, it is necessary to remember that this igneous rock was produced by a flow of lava that was poured over the sea floor in the carboniferous limestone period, and lay in a heated and very slowly cooling mass upon the rocks below it. These underlying rocks would be strongly heated, and the heat downwards could only escape slowly through the underlying rocks which it would alter in the well-known metamorphic manner. The heat that escaped upwards would be carried away by the sea water, and the sea floor would be somewhat rapidly cooled; but as all lava is a bad conductor of heat the lower layers of the lava might remain in a red-hot condition for a very considerable period, and the underlying limestone would be strongly heated for an equally long time, would become thoroughly dried and baked, and the whole structure of the rock would be altered. Limestone under these circumstances would be turned into a marble, and the marmorisation would slowly die out downwards as the rocks became less and less strongly heated from above. This is what has actually taken place in the rocks in both east and west quarries, and it is extremely interesting to notice the gradual change in the character of the polished specimens taken from different broad bands of greater and greater depth." Much of the beauty of this marble depends upon the fact that the symmetrical remains of the "sea lilies" contained in it were not destroyed, but were crystallised in the process of baking, while the lime mud around them, and the cement that formed their matrix, was changed by the heat under pressure to a solid crystalline hardened paste, that is not only tough and exceedingly durable, but takes a most brilliant polish, while each layer presents its own pattern and its own coloration. Several plates show varieties of the stone; there is a folding view of the Middleton quarry, and there are many illustrations of important buildings in which Hopton-Wood stone has been used structurally and ornamentally.

Lifts and Cranes and Electric Installation

The firm of Messrs. Neville Kaye and Co., Ltd., 231-2, Strand, W.C., has been organised and registered to carry on an engineering business, and more particularly to specialise in electric, hydraulic, and hand-power lifts and cranes, and electric lighting and plant installations. Suitable works have been acquired in Sigdon Road, Hackney, N.E., and are being equipped with the latest modern machinery. Mr. H. Neville Kaye, the managing director, will be remembered as formerly the London manager to a well-known firm.

Mr. H. E. Tatham, who is no longer connected with E. Tatham and Co., Ltd., 25a, Holland Street, Kensington, is now acting as manager to F. B. Tatham, parquet, marble, mosaic, and tile merchant, of West Ealing.

The Sanatoria air bricks have been fixed outside the new council schools at Birkenhead. Many schools at present being built are adopting this ventilator.

Matters of Opinion.

No. 1 (continued).—The Increased Employment of Specialist Contractors.

We have received the following letter from the President of the Warrington and District Master Builders' Association:—

Dear Sir,—The members of this Association have been considerably interested in the correspondence appearing in your Journal on this subject, and at a meeting of the Committee held recently I was requested to write and emphasize the views put forward from the Liverpool Master Builders' Association in your issue of the 13th instant. Members of this Association can testify that under the present system the builder bears all the responsibility and often much expense in attendance on specialists, and in most cases received little or no remuneration.

It is certain the matter cannot proceed on the present unsatisfactory lines, and it is to be hoped that builders will soon make a stand and refuse to have anything to do with specialists unless the architect makes proper provision to remunerate the builder for his trouble.

Yours faithfully,
HENRY COLLINS,
President.

A strong desire to keep the Bradford Town Hall extension contracts in local hands is being manifested in the council and in the Press. Alderman Robinson has proposed that the work should be let to firms in the city, and he is supported by newspaper correspondents, who contend that while so large a percentage of craftsmen in the city are on the verge of destitution, it would be wise to give the contracts to local firms, even supposing this course involved increased expenditure.

Federation Notes.

THE YORKSHIRE FEDERATION OF BUILDING TRADE EMPLOYERS.

The monthly meeting of the executive council of the Yorkshire Federation was held at the Great Northern Hotel, Leeds, on Thursday, January 21st. Mr. W. R. Thompson (president), Mr. A. G. White, the National Secretary, and 43 delegates from the affiliated associations were present.

Minutes of last meeting were read and approved. Apology for absence was reported from Alderman W. H. Jessop, J.P., Huddersfield.

The procedure to be adopted at the general meetings of the National Federation in respect to the case of a Yorkshire contractor was considered. On the motion of Mr. J. Biggin, the president and representatives of the Federation were requested to mention this case to the Executive Council and annual general meeting, in order that the National Administrative Committee may be empowered to give financial support, in case they think fit, to sanction legal proceedings.

It was reported that the National Administrative Committee had accepted the invitation of the Yorkshire Federation for the Annual Conference of Secretaries to be held in Leeds in October next. On the motion of Mr. S. Coop, seconded by Mr. W. H. Holroyd, it was resolved to obtain 100 copies of the report of the Conference of Secretaries, held in October, 1908, for the use of Members of the Council.

The president reported that copies of forms of sub-contract agreements approved and issued by several Federations had been obtained and were receiving attention.

Attention was drawn to the fact that, although one or two local associations had been successful in obtaining the renewal of advertisements inserted in last year's directory, that instructions had not yet been received for the renewal in several other instances. Local associations were reminded that the financial success of the directory absolutely depended on their loyal co-operation and active support, and an earnest appeal was made for every effort to be made to secure the renewal of the existing advertisements, and to obtain additional ones.

Attention was drawn to Section 30 of the Housing, Town Planning, etc., Bill, an additional clause carried in committee in face of the strenuous opposition of the Government. The clause requires a quinquennial survey and register of all property under £26 in towns of 50,000 and upwards, and of £16 in towns under that population. On the motion of Mr. P. Rhodes, seconded by Mr. A. J. Forsdike, the National Administrative Committee were requested to urge upon the Employers' Parliamentary Council the great injustice which the clause might inflict upon owners of property, and to use every means in their power to obtain its omission from any draft Bill which may be introduced by the Government during the coming session.

Attention was drawn to the statement by the Prime Minister that he was in sympathy with the proposal to deal with the evils of sweating by way of a wages board. Mr. W. Irwin moved a resolution, which was seconded by Mr. W. H. Holroyd, that the Federation impress upon the National Federation and the Employers' Parliamentary Council the urgent necessity of ensuring that trades which are sufficiently organised shall be exempted from any legislation which may be introduced with the intention of ameliorating evils existing in trades not sufficiently organised.

The report of the committee appointed to consider the fair wages resolution of the House of Commons embodied in Government contracts was considered. Mr. White, the National secretary, stated that he was preparing a standard fair wages clause, embodying equitable conditions for the ratepayers, the contractor, and the operatives, which he hoped to submit to the National Federation at an early date.

The president stated that at the annual meeting of the Northern Centre the subscription of the three constituent Federations to the National Federation would be considered, and he asked whether the Federation had any instructions to give to their representatives. On the motion of Mr. P. Rhodes, seconded by Mr. A. W. Sinclair, the Federation representatives were empowered to concur in the payment of the National subscription for the current year on the commuted basis and in the existing proportions.

The annual report of the Council of the National Federation and the agenda for the national general meetings were considered.

A letter was read from the Sheffield Association with respect to the payment of walking time to operatives on jobs outside the area prescribed in the working rules. It was resolved, on the motion of Mr. A. J. Forsdike, seconded by Mr. W. T. Ledgard, to request the secretary of each local association to forward to the Federation secretary a copy of the working rules, and also particulars of any similar points which may have been raised, or other difficulties which have been experienced with respect to walking time.

Mr. W. H. Holroyd invited the Federation to hold the next meeting in Bradford. The invitation was accepted, and the date of the meeting fixed for February 18th, 1909.

The annual dinner was afterwards held in the Great Northern Hotel, Leeds, when 114 members and friends were present.—J. DAVIDSON, secretary.

The members of the Yorkshire Federation of Building Trade Employers dined together at the Great Northern Hotel, Leeds, on January 21st. About 120 gentlemen sat down. Mr. W. R. Thompson, of Dewsbury, president, occupied the chair, and among those present were the Lord Mayor of York (Alderman J. Birch), the Mayor of Dewsbury (Mr. F. W. Reuss), Mr. A. W. Sinclair, of Scarborough (a former president of the Federation); Mr. A. G. White, of London, secretary of the National Federation; Mr. J. W. White, of Sunderland, treasurer to the National Federation; Mr. W. G. England, of Barnsley (a vice-president of the Yorkshire Federation); and Mr. J. Davidson, of Leeds (the secretary).

Mr. A. W. Sinclair, in submitting the toast of "The National Federation," said it had provided an organisation which the trade had long needed, and by its means they had been able not only to approach the Royal Institute of British Architects, but municipal and other Councils, and even the Government of the day. More pleasing still was the work it had done in the matter of the operatives. The Federation had been able to cultivate relationships with the operatives by means of which reason had taken the place of the old methods of barbarism. If there was one work with which he was pleased more than another it was this scheme of conciliation. In the large branches of the trade it was not now possible to have a strike without the matters in question being referred to a conciliation or arbitration court. These boards were set up in every town where the employers and men were organised. By means of the National Federation also builders had been able to get from the Royal Institute of British Architects a just and equitable form of contract, which secured to the proprietor, to the architect, and to the builder fair and reasonable terms.

Mr. A. G. White, speaking in reply, said he knew of no county Federation which conducted its affairs in a better or more statesmanlike manner than the Yorkshire Federation. Glancing ahead, there were in his view two things which required serious attention. One of them was a National scheme of apprenticeship. From statistical information which had been obtained at headquarters, it was clear that in the building trade the members of the Federation were not making the required number of apprentices in any of the allied trades to make good the losses that arose from death, emigration, accident, and other causes. Builders would remember that the cause of the trouble with the plasterers a few years ago was really the scarcity of apprentices. The trade in France had lately been troubled with a shortage of skilled labour. The President of the Builders' Society of Paris had pointed out that neither the workman nor the masters cared to take the trouble to make apprentices. On account of the small sum of money paid to apprentices, parents preferred to send their children to employment that was more remunerative. They said the law was averse to them, that the specialisation of machinery was inimical to apprenticeship, and that employers themselves had abused the system by putting boys to all sorts of menial work not really connected with their trade. It was argued, moreover, that trade unionists had refused to instruct apprentices, and that there were no means of controlling recalcitrant apprentices. He (Mr. White) was afraid that if they examined matters they would have to admit that a good many of the conditions which applied to France would apply at home. He knew that his own experience lay in that direction. Quoting from the same French authority, he found that out of over half-a-million young persons employed in commerce and industry in France, only 19,000 received technical and theoretical instruction, 100,000 received some theoretical instruction, and 475,000 received no instruction of any kind. They were convinced in France that this matter would have to be seriously taken in hand, and he was of opinion that the question would have to be tackled here. Another problem which would have to receive attention was the abuse of the present compensation law. In France where a system similar to ours prevailed, the result had been extremely unsatisfactory, and the abuses had become so great that a stong movement was setting in in industrial quarters in favour of an amendment of the law. Abuses took the form of the simulation of injuries, and touting by medical men, with the object of getting as much as possible out of every accident. The result had been that in France there had been a great increase in the number of accidents reported—indeed, as much as 300 per cent. Medical and medicinal expenses per accident had doubled since 1901, and insurance rates had risen from 6 to 12 per cent. He (Mr. White) thought the Federation ought to get prepared. Of course, they could not do anything until they had a case, but by keeping statistical information of all the cases which arose—whether of malingering or of excessive medical or legal expenses—they might at the right time bring an overwhelming case for amendment before the Government.

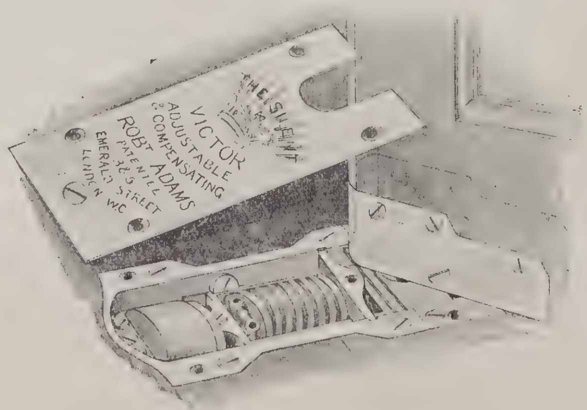
Mr. J. W. White gave the toast of "The Yorkshire Federation."

The President, in acknowledgment, congratulated his fellow-members on the solid and compact position the Federation occupied. During the past year the Council had been occupied with the Home Office report on building accidents. Some of the clauses it contained would have been very much inimical to the building trade; they would have meant serious expense and increased cost in scaffolding, as well as aggravated the difficulties of carrying on the business by the stringency of the regulations proposed. He (Mr. Thompson) believed that the resolutions passed by the Yorkshire Federation had a great effect on Mr. Gladstone in dropping the proposed regulations during the past session. Another serious menace to the trade was the Works Departments which many municipal authorities proposed to set up, and there was no doubt that the pamphlet issued by their secretary (Mr. Davidson), setting forth the cost of these departments, had its effect at the elections which took place in November. He (the president) objected to the building trade being made the dumping ground for the unemployed. It meant an increased cost of from 50 to 100 per cent., and in some cases the employment of out-of-works had had the effect of displacing good men, who might otherwise have been employed.

Other toasts honoured included "The City and Trade of Leeds," "Architects and Surveyors," and "Guests and Visitors." The speeches were interspersed with agreeable selections of music.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.

PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE,
with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.

60 HIGHEST AWARDS.

The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing.

— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

THE

Architects' Law Reports and Review (Illustrated).

Compiled by ARTHUR CROW, F.R.I.B.A.
District Surveyor (London Building Acts, &c.).
LEGAL EDITOR
A. F. JENKIN, Esq.
Of the Inner Temple, Barrister-at-Law, Author of Jenkin's "London Government Act, 1899," &c., &c.

NOW READY. **VOL. III.** **10/- net.** **Post Free, 10/4.**

CONTAINING REVISED REPORTS OF
LEADING CASES
DECIDED IN THE
HOUSE OF LORDS AND THE SUPERIOR COURTS,
AFFECTING
BUILDINGS, STREETS, SEWERS, &c.
Reprinted by permission from the "Law Times" and the "Justice of the Peace."

This Series of Reports is specially prepared to meet the requirements of Architects, Surveyors, Municipal and County Engineers, and Surveyors to Urban and Rural Authorities.

Ancient Lights,
Party Structures,
Building Contracts,
Dilapidations,
Arbitrations, &c.

CASES UNDER
THE LONDON BUILDING ACTS,
THE PUBLIC HEALTH ACTS,
THE FACTORY AND WORKSHOP ACTS,
THE METROPOLIS MANAGEMENTS ACTS, &c., &c., &c.

Combined Drainage,
Paving Expenses,
Extraordinary Traffic,
Assessments,
Compensations, &c.

In order to make the points at issue clear and intelligible the DRAWINGS AND PHOTOGRAPHS USED IN COURT have been reproduced.

Printed and Published by PHIPPS & CONNOR, 13 & 14, TOTHILL STREET, WESTMINSTER ABBEY, S.W.

PHIPPS & CONNOR,

Parliamentary and Artistic Printers,
Manufacturing and General Stationers.

Special Watermarked Notepaper and Typewriting Papers, Stamped Relief, Lithographed or Printed.
Envelopes, High Flaps, Well Gummed, Stamped Relief.
Foolscap Papers, Azure Laid and Cream Laid, in all Rulings.
Whatman's Best Hand-made Drawing Papers; Drawing Cartridge; Tracing Papers.
Surveying and Sketching Books; Drawing Boards; T Squares; Scales; Drawing Instruments.
Indian Inks; Rowney's and other Water Colours; Brushes.
Account Books: Cash Books, Ledgers, &c., Half Bound Red Leather or Whole Bound Calf.
Copying Apparatus; Letter Books; Typewriting Accessories.
General Office Stationery.

SPECIFICATIONS PRINTED AT SHORT NOTICE.
: : : ARCHITECTS' PRINTING OF ALL KINDS. : : :

THE ABBEY PRESS, 13 & 14, TOTHILL STREET,
WESTMINSTER ABBEY, S.W.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application.

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

*This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberystwyth (Wales).—For additional classrooms, manual training room, cookery centre, etc., at Alexandra Road Council School, for Cardigan County Education Committee. Mr. G. Dickens-Lewis, county architect, North Parade, Aberystwyth:—

J. Hayes	£7,890	0	0
Treasure and Son, Ltd.... ...	7,523	0	0
W. H. Thomas	7,176	0	0
J. Dallow and Sons	6,950	0	0
Edwards Bros.	6,498	0	0
Humphreys and Williams ...	6,311	19	2
Owen Bros.	5,997	0	0
Jones and Lewis	5,495	0	0
E. E. Jenkins,* Aberystwyth...	5,488	0	0

*Accepted.

Chipping Norton, Oxon.—Additions to house and stabling at "Foxholes," Chipping Norton, Oxon., for Horsman Bailey, Esq., Berners Street, London. Messrs. Cancellor and Hill, architects, 12, Jewry Street, Winchester:—

Thomas Burden, Chipping Norton	£5,252	0	0
Knowles and Sons, Oxford ...	5,096	0	0
Benfield and Loxley, Oxford ...	4,943	0	0
Cubitt and Co., London, W.C...	4,922	0	0
Booth and Son, Banbury ...	4,583	10	0
C. and T. Cannon, Aylesbury...	4,544	0	0
A. Groves and Sons, Milton, Oxfordshire	4,495	0	0
Grace and Sons, Clatford ...	4,491	0	0

Newbury.—For girls' school new buildings, for the Berkshire Education Committee:—

Bosher and Sons	£10,588	12	4
Silver and Sons	9,994	0	0
Collier and Catley	9,699	0	0
Hoskins Bros.	9,400	0	0
A. J. Chivers	9,350	0	0
W. Creed	9,324	0	0
H. Elms	9,099	0	0
E. C. Hughes	9,095	0	0
G. Elms	8,989	15	6
C. W. Cox and Sons	8,988	0	0
Houghton and Hitchman ...	8,974	0	0
J. B. Steward,* Wokingham ...	8,928	0	0

*Accepted.

Southampton.—For additions to Ascupart School, for the Education Committte:—

J. Douglas	£12,033
T. R. Long	10,750
Playfair and Toole	10,098
Dyer and Sons	9,940
Golding and Ansell	9,867
Jenkins and Sons	9,836
H. Stevens and Co.	9,468
J. Nichol.* Bitterne Park	9,360

(All of Southampton.)

(Borough Engineer's protecting estimate, £9,750.)

*Accepted.

Tiptree.—For the erection of a school, for the Lexden and Winstree District Sub-Committee. Mr. J. W. Start, F.S.I., architect, High Street, Colchester. Quantities by Messrs. Goodey and Cressall, of Colchester:—

Johnson and Co., Colchester...	£2,736	0	0
W. Chambers, Colchester ...	2,635	0	0
H. B. Arnold, Tiptree	2,589	19	0
T. J. Ward, Colchester	2,555	5	0
F. Saunders, Dovercourt ...	2,496	0	0
Parkinton and Son, Ipswich ...	2,470	0	0
Pavitt and Son, Aveley... ...	2,450	0	0
H. Gurton, Tiptree	2,421	0	0
Spalding, Sons and Co., Norwich	2,418	0	0
Spencer, Santo and Co., London	2,358	0	0
Smith and Sons, Witham ...	2,355	0	0
Grimwood and Son, Sudbury ...	2,295	0	0
C. Theobald, Chappell	2,197	0	0
R. Beaumont, Lexden	2,184	0	0
B. B. and M. Barrell, Wivenhoe	2,184	0	0
Everett and Son, Colchester ...	2,130	0	0
F. Bennett, Ipswich	2,100	0	0
C. Thorp, Tiptree	2,057	0	0
C. Deaves,* Bures	2,021	0	0

*Accepted.

Watford.—For the erection of a pair of semi-detached villas on Nascott Estate, for Fredk. Gee. Mr. S. E. Gomme, architect:—

Clifford and Gough	£1,469
C. Eames	1,346
Clark Bros.,* Watford	1,272

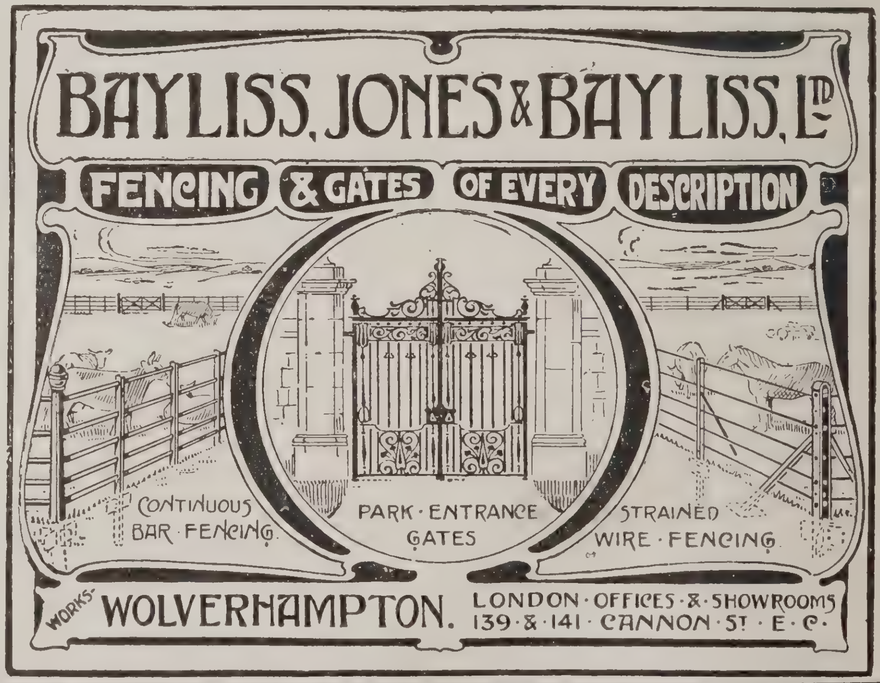
*Accepted.

(*Tenders continued on page viii.*)

ARCHITECTS, SURVEYORS, CONTRACTORS, Etc.,
Assisted with special or immediate extra help by competent and experienced Designers and Draughtsmen at ordinary Assistant's Charges.
WRITE FOR PARTICULARS OR REPRESENTATIVE WILL CALL.
City of London and Finsbury Drawing & Tracing Offices.
63, FINSBURY PAVEMENT, MOORGATE STREET STATIONS, E.C.
Estd. 1887. LEWIS PITCHPINE, Manager.
Telephone: 1099 CENTRAL.
Telegrams: "PITCHPINE, London."

"THE" LIFT & HOIST Co.,
Also Revolving Shutters,
Iron Doors and Iron Fire-Escape Stairs,
Premier Ironworks,
DEPTFORD, S.E.

LAUNDRY
and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

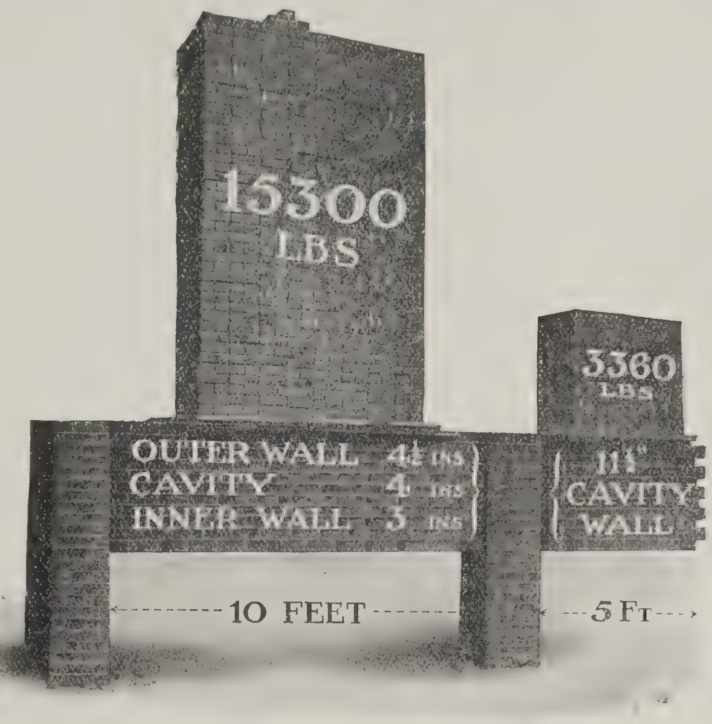

BAYLISS, JONES & BAYLISS, Ld.
FENCING & GATES OF EVERY DESCRIPTION
CONTINUOUS BAR FENCING.
PARK · ENTRANCE GATES
STRAINED WIRE · FENCING.
WORKS WOLVERHAMPTON.
LONDON · OFFICES · & · SHOWROOMS 139 · & · 141 · CANNON · ST. · E · C ·

FOLDING PARTITIONS. REVOLVING SHUTTERS.
Hartley Bros.,
2/- ft. Super.
1/- ft. Super.
GORTON, MANCHESTER.

Butters Bros. CRANES FOR CONTRACTORS.
WATERLOO STREET, GLASGOW.

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork.



H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

Rd. JOHNSON CLAPHAM, & MORRIS, Ltd.,

Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered
Soundproof,
Fireproof
Dampproof,

Architects, Builders, and Contractors

Write for Descriptive Catalogue.

Engineering Department,
24, Lever Street,
MANCHESTER.

Telegrams;
"Metallicus, Manchester."

Hollow Wall and Cantilever constructed of 4½-in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

Telephone:
6437 Manchester.

THE RENOWNED . . .

ANDREWS-HAWKSLEY PATENT TREAD

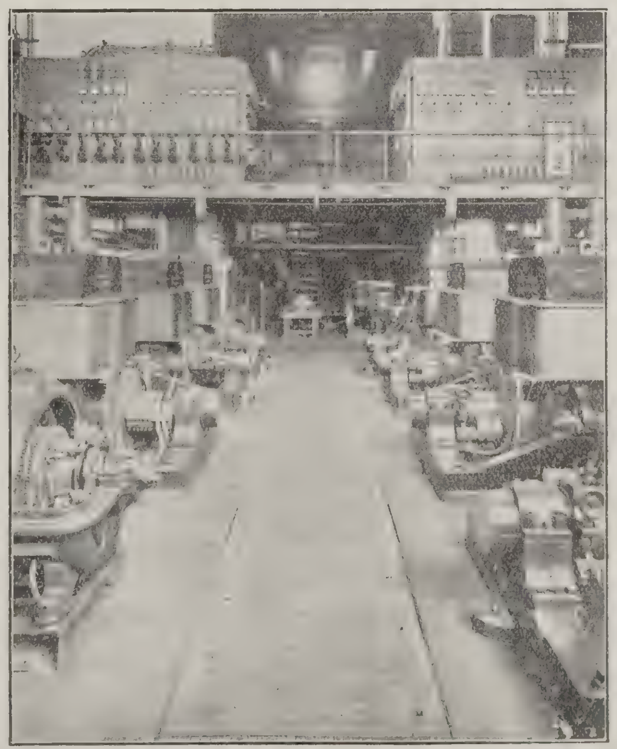
Applied to WOOD, IRON, STONE or CONCRETE STAIRWAYS, FLOORS, LANDINGS, PLATFORMS, Non-conducting FLOOR PLATES for ELECTRIC LIGHT and POWER STATIONS, PAVEMENT COVERS, etc., etc.

Pioneers of all Stair Treads.

The Tread that has Lasted a Lifetime.

There is nothing to equal it in the market.

Quotations given for Concrete Steps fitted complete with our Treads.



MILLBANK GENERATING STATION, WESTMINSTER.
(Under C. Stanley Peach, Esq., F.R.I.B.A.)

SPECIALISTS IN
Light Constructional Work in Iron or Steel.
Special Work in Wrought or Cast Iron.
Staircases of Every Description.
Concrete and Granolithic Work, etc., etc.

USED BY—
Great Western Railway.
London and North Western Rly.
London Brighton and South Coast Railway.
Great Northern Railway.
Midland Railway.
North Eastern Railway.
North British Railway.
Lancashire and Yorkshire, etc., etc.

THE ANDREWS-HAWKSLEY PATENT TREAD & ENGINEERING COMPANY,
Columbia Works, Prestons Road, Poplar, London, E.

(*Tenders continued from page vi.*)

Aberdare.—For erection of a receiving home at Aberdare, for the Merthyr Board of Guardians:—

Jones Bros., Edwardsville, Treharris	£1,850	0	0
D. Rees, Trecynon, Aberdare	1,713	0	2
Davies and Francis, Hengoed	1,687	8	7
Hatherley and Co., Rhymney	1,667	0	0
D. T. Davies, Trecynon, Aberdare	1,613	12	0
W. H. Ingleson, Merthyr	1,567	0	0
W. Brown, Merthyr	1,562	8	5
Jones Bros.,* Abercwmboi, Aberdare	1,515	0	0

*Accepted.

Exeter.—For new mineral water factory and stabling at Belgrave Road, for Mr. W. H. Grafton. Mr. R. M. Challice, architect, 14, Bedford Circus, Exeter:—

Oliver and Son	£937	0	0
W. Brealy	902	0	0
T. Seeman	899	7	0
G. Herbert	899	0	0
J. and J. M. Soper	890	0	0
J. Triggs	879	0	0
Ham and Passmore	871	0	0
G. Letter	870	0	0
W. J. Coles	859	4	0
L. Smale	835	0	0
Westcott, Austin and White	824	11	10
Baker Bros.,* Cowick Lane, St. Thomas	787	0	0

*Accepted.

Hereford.—Accepted for erection of a mortuary chapel at the new cemetery, for the City Council:—

W. Powell, Hereford	£697

Lowestoft.—Accepted for new secondary school (accommodation 300), for the Lowestoft Education Committee:—

Charles Roper, Waterworks Street, Ipswich	£9,143

Lymington.—Accepted for building a school in Cannon Street, for the Hants Education Committee:—

Rashley and Co.	£2,800

North Tawton (Okehampton, Devon).—For construction of North Tawton Waterworks, for the Okehampton District Council:—

T. Cook Starkey, Hull	£3,409
G. H. Swainson, Porthcawl, South Wales	2,638
G. B. Turpin, Plymouth	2,599
E. W. R. Lester, Plymouth	2,371
W. Furze, Okehampton	2,274
Fisher and Co., North Tawton	2,205
G. Cronson and Co., Westminster	2,103
W. J. Avery, Okehampton	2,033
S. Ellis and Son, North Tawton	1,898
Steer and Pearce, Plymouth	1,820

Also tendered—Shaddock, Plymouth, no grand total given. Note.—The tenders have been referred to the Finance Committee and Engineer.

Salisbury.—For erection of a workshop, stores, etc., in Friary Lane, in connection with the Waterworks Department for the Urban District Council, Mr. W. J. Goodwin, A.M.I.C.E., city engineer and surveyor:—

Wort and Way	£769	0	0
Collins and Son	751	18	8
E. Preece, Trowbridge	750	0	0
H. Tryhorn	736	10	0
Smith and Bundy	725	0	0
Roles and Son	719	15	0
Harris Bros.	710	0	0
Billett and Musselwhite*	694	19	6
Day Bros.	576	0	0

*Accepted.

Southampton.—For carrying out the alterations and additions to Western District School, for the Corporation:—

J. Nichol	£6,948
Dyer and Sons	6,778
Jenkins and Sons, Ltd.	6,778
H. Stevens and Co.	6,664
J. Douglas	6,449
Golding and Ansell*	6,327

(Borough Engineer's protecting tender, £7,000.)

*Accepted.

Coming Events.

Thursday, January 28.

Institute Members' Club.—Meeting in R.I.B.A. Smoking Room, 5 p.m.

Architectural Association —General Meeting of the Camera and Sketching Club.

Manchester Society of Architects.—Mr. A. T. Bolton, A.R.I.B.A., on "The dome as the Basis of an Architectural System, 6.30.

Friday, January 29.

Architectural Association.—Meeting of Debating Society. Mr. H. J. Leaning on "Approximate Estimating," 7 p.m.

Saturday, January 30.

Architectural Association.—Second Spring Visit, General Post Office, Newgate Street, 3 p.m.

Monday, February 1.

Royal Institute of British Architects.—President's Address to Students, and Presentation of Prizes.

Liverpool Architectural Society.—Mr. Mervyn E. Macartney, F.R.I.B.A., on "The Three Churches of St. Paul."

London University.—Mr. Banister Fletcher, F.R.I.B.A., on "Spanish Renaissance (and Modern) Architecture," 8 p.m.

Society of Engineers.—First ordinary meeting.—Inaugural address by the President, Mr. E. J. Silcock, 7.30.

Wednesday, February 3.

Northern Polytechnic Architectural and Building Students' Association.—Mr. B. Livingstone, on "Reinforced Concrete," 8 p.m.

Northern Architectural Association.—Ordinary meeting. Paper by Mr. H. Barnes, A.R.I.B.A., 7.30 p.m.

Thursday, February 4.

Leicester and Leicestershire Society of Architects.—Mr. B. J. Fletcher, "Notes on Town Planning."

Friday, February 5.

Architectural Association.—Mr. H. T. Buckland, on "Schools."

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following:

J. C. (Southgate), J. P. (Hammersmith), F. C. (Durham), T. R. (Scarboro'), B. S. (Winslow), S. G. (Manchester), R. W. (Bristol), H. E. F. (Birkenhead), W. A. M. (Wakefield), B. M. (Biggleswade), C. G. (Hull), R. L. H. (Rochester), R. M. (Edinburgh), H. I. (London), S. F. (London), E. H. (London), J. B. M. (Derby), W. M. Pontyclan), P. F. (Bradford), J. L. L. (Burnley), F. G. (Bristol), B. N. (Llandudno), E. E. B. (London), R. C. (Fleet), J. W. W. (Sunderland), J. S. (Manchester), A. T. R. (Lartford), S. A. C. (Lowestoft), A. C. T. (Ayr), E. T. W. (Cobridge), J. R. M. (Hornsey Rise), F. B. W. (Wisbech), W. M. (Tonbridge), J. R. H. (North Shields), B. L. (Leeds), W. J. (Scarborough), L. R. (Barnoldswick), J. D. (Glamorgan), W. I. (Coventry), P. P. (Swansea), J. T. B. (Huddersfield), E. J. G. (Hinckley), A. B. P. (Brighton), J. B. C. (South Shields), T. A. W. (Kilmarnock), W. S. (Blackburn), G. E. G. (Westcliffe-on-Sea), A. G. F. (Lincoln), W. B. (Edinburgh), G. F. D. (Leeds).

'Phone Holborn 1562.

The Brilliant Sign Co. 1907 Ltd.

Original Manufacturers of Brilliant Sunk Gilt Copper Window Letters.

THE LARGEST MANUFACTURERS IN THE WORLD OF

PLATE GLASS FACIAS
STALLPLATES
SWING SIGNS
GILT WOOD LETTERS
ILLUMINATED SIGNS
(of every known style)
REPOUSSÉ COPPER WORK
WINDOW LETTERS

Guaranteed Best Work—Keenest Rates in the Trade.

60 pp. Illustrated Art Catalogue Free.

Wire: "Signboards, London."

38 Grays Inn Rd London W.C.

BRILLIANT SUNK GILT COPPER PLATE GLASS FACIAS, &c.

PROMPT DELIVERY. REPRESENTATIVES SENT TO ANY PART

TELEPHONE No. 9492 Central

MEASURES BROS LTD 53B SOUTHWARK ST LONDON S.E. & PITLAKE, CROYDON

TELEPHONE No. 171 CROYDON

10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.

SECTION SHEETS, BOOKS & PRICES ON APPLICATION.

CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.

STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Jan. 27. GRANGETOWN.—Works required (exclusive of joiner's and painter's) in additions, etc., to premises at Grangetown for the Middlesbrough Co-operative Society, Ltd. Persons desirous of tendering should send their names, etc., by Jan. 27, to Walter G. Roberts, architect, 61, Albert Road, Middlesbrough. Bills of quantities will be supplied.

Jan. 27-Feb. 20. REDHILL.—Erection of an elementary school at Cromwell Road, Redhill, for the Reigate Education Committee. Builders desirous of tendering are required to send their names to the secretary by Jan. 27, together with a deposit of one guinea for bills of quantities, which will be supplied by post. Plans, specification, conditions of contract, and form of tender will be open for inspection at the office of the architects, T. R. and V. Hooper, Market Hall, Redhill. Sealed tenders, marked "Tender for Schools," must be delivered to A. Lund Newell, secretary, Municipal Buildings, Reigate, by noon on Feb. 20.

Jan. 28—Feb. 16. NECHELLS.—Erection of a council school in Charles Arthur Street, Nechells, for the Birmingham Education Committee. Applications for forms of tender and bills of quantities may be made by Jan. 28, at the finance office at the Education Department, Edmund Street, Birmingham, accompanied by a deposit of £2 Drawings may be seen on and after the same date in the architect's office at the education department. Tenders must be delivered in sealed envelopes, addressed to Jno. Arthur Palmer, secretary, education department,Edmund Street,by noon on Feb. 16, endorsed "Tender for Council School, Charles Arthur Street." Fair wages clause.

Jan 29. PAULTON.—Erection and entire completion of a new Sunday school, for the trustees of the Primitive Methodist Chapel. Builders desirous of tendering should send their names to Rev. Clark, "Rosslyn." Midsomer Norton. Plans and specifications may be seen at H. Manley's, New Town, Paulton. Sealed tenders, duly endorsed, to be sent to Rev. Clark by 12 a.m. on Jan. 29.

Jan. 30. GLANDOVEY.—Erection of a cottage and stables at Glandovey for Percy W. Boughton Leigh. Plans and specifications may be obtained on application to G. T. Bassett, A.R.I.B.A., architect and surveyor, Aberystwyth, to whom tenders should be sent sealed and endorsed, by Jan. 30.

Jan. 30. GOOLE.—Execution of work at the new secondary school, now being erected in Boothferry Road, Goole, for the governors. Caretaker's cottage, play sheds, cycle sheds, boundary walls and railings, paving to playgrounds, and drives. Quantities will be forwarded on payment of one guinea. Applications for quantities to be made by Jan. 30, to W. T. Silvester, solicitor, clerk to the governors, Goole.

Jan. 30. KENFIG HILL (Wales).—Erection of two shops and a dwelling house (attached) at Evans Street, Kenfig Hall, for Thomas Nicholas, Victoria Buildings, Port Talbot. Sealed tenders, endorsed "Shops at Kenfig Hill," to be delivered to Aneuryn T. James, architect and surveyor, 23, Station Road, Port Talbot, by noon on Jan. 30. Plans and specifications may be seen at the architect's office.

Jan. 30. ELLAND (Yorks.).—Various trades required in erection of a four-storied fireproof mill, engine house, at Springwood Mills, Holywell Brook, Elland, for R. and J. Holroyd. Plans, specifications, and detail drawings will lay for inspection, and quantities may be obtained at the offices of Chas. F. L. Horsfall and Son, architects, Lord Street Chambers, Halifax, till Jan. 30, when sealed tenders must be delivered to the architects by 1 p.m.

Jan. 31. ABERYSTWYTH.—Erection of 18 dwelling houses, for the corporation, sites are situated as follows:—Four on the western side of Skinner Street; seven on the eastern side of Skinner Street. Seven in Poplar Row and Pound Place. Plans and specifications may be seen at the borough surveyor's office. Tenders may be sent for the whole 18 houses, or separately, for blocks. Tenders to be sent by Jan. 31, to A. J. Hughes, town clerk, and should be marked on the outside "Tenders for Workmen's Dwellings."

Feb. 1. MELTON MOWBRAY.—Alterations and additions to the cattle market, for the U.D.C., consisting of new open shed, offices, stables, alterations to existing buildings, paving, and ironwork to roofs, pens, etc. Quantities for the following sections of work, viz.—1, builders'; 2, ironfounders'; 3, painters', can be obtained on application by Feb. 1, to Edmund Jeeves, surveyor, Nottingham Street, Melton Mowbray. Two guineas deposit for each section required.

Feb. 1. LEIGHTON, near Crewe (Cheshire). —Erection of a single house and set of farm buildings at Leighton, near Crewe, Cheshire. Plans and specifications can be seen at the county estate office, 49, Northgate Street, Chester, and quantities obtained on deposit of £1. Tenders are to be delivered to the land agent, by Feb. 1, endorsed "Tender for Small Holdings Equipment, Leighton Estate." For further particulars apply to the land agent, the county estate office, 49, Northgate Street, Chester.

Feb. 1. LEDSHAM (Cheshire).—Erection of four single houses and six semi-detached houses, with 16 sets of farm buildings, on the Ledsham estate, near Ledsham station, Cheshire. Plans and specifications can be seen at the county estate office, 49, Northgate Street, Chester, and quantities obtained on deposit of £1. Tenders to be delivered to the land agent, by 11 a.m. on Feb. 1, endorsed "Tender for Ledsham Estate Small Holdings Equipment." For further particluars apply to the land agent, the county estate office, 49, Northgate Street, Chester.

Feb. 1. LLYN TRAFFWLL.—Construction of an engine house, filter bed, cottage, and other works to be situate at Llyn Traffwll, about three miles by road from the Valley station of the L. and N.W.R., for the Holyhead Waterworks Company. Drawings may be seen, and specification, form of tender and schedule of quantities obtained on payment of five guineas at the office of H. Rofe and Son, civil engineers, 8, Victoria Street, Westminster. Copies of drawings may also be seen at the Waterworks office, Stanley Street, Holyhead. Tenders to be sent by 10 a.m. on Feb. 1, endorsed "Tender for Engine House, Filter Bed, etc., to J. C. Lawfield, secretary, Waterworks office, 17, Stanley Street, Holyhead.

Feb. 2. LAMBOURN.—Erection of a new station building at Lambourn, Berks, for the directors of the Great Western Railway. Plans, etc., may be seen, and forms of tender, etc., obtained, at the office of the engineer at Paddington Station, London. Tenders to be submitted by Feb. 2.

Feb. 2. PENYWERN, DOWLAIS.—Erection of 68 houses at Penywern, Dowlais, for the county borough of Merthyr Tydfil. Sealed tenders, endorsed "Penywern Houses," must reach T. Aneuryn Rees, town clerk, town hall, Merthyr Tydfil, by noon on Feb. 2. Plans and specifications may be seen, and forms of tender obtained, at the office of the borough surveyor, town hall, Merthyr Tydfil.

Feb. 2. BRIXHAM, TAVISTOCK, and PRINCETOWN.—Erection of stables at Brixham, Tavistock, and Princetown, for the directors of the Great Western Railway. Plans and specification may be seen and forms of tender and bills of quantities obtained at the office of the engineer at Plymouth (North Road) station, between 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, and marked outside "Tender for Stables at Brixham, etc.," will be received by Feb. 2.

Feb. 2. LOWESTOFT.—Enlargement of Lowestoft post-office, for the commissioners of H.M. Works and Public Buildings. Drawings, specification and a copy of the conditions and form of contract may be seen on application to the postmaster. Bills of quantities and forms of tender may be obtained at the office of works, on payment of one guinea. Tenders must be delivered before noon on Feb. 2, to the secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., and endorsed "Tender for Lowestoft Post Office Enlargement."

Feb. 2. BRISTOL.—Construction of a new engine shed and other works at St. Philip's Marsh, Bristol, for the directors of the Great Western Railway. Plans and specification may be seen, and forms of tender and bills of quantities obtained, at the office of the new works engineer, at Paddington Station, between 10 a.m. and 4 p.m. Tenders, addressed to G. K. Mills, secretary, Paddington Station, London, and marked outside "Tender for St. Philip's Marsh Engine-shed," will be received by Feb. 2.

Feb. 3. BRADFORD.—Alterations to cottages, Broad Lane, for the Corporation. Drawings and general conditions of contract may be seen, and bills of quantities and forms of tender obtained, on application to the city architect, Whitaker Buildings, Brewery Street, Bradford. Sealed and endorsed tenders must be sent by 9 a.m., Feb. 3, to Frederick Stevens, town clerk, Town Hall, Bradford. Fair wages clause.

Feb. 3. BARNSLEY.—Additions to the Barnsley Post Office, for the commissioners of H.M. Works and Public Buildings. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to the postmaster, between 10 a.m. and 4 p.m. Bills of quantities and forms of tender may be obtained at the undermentioned address on payment of one guinea. Tenders must be delivered before noon, on Feb. 3, addressed to the secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., and endorsed "Tender for Barnsley Post Office—Additions."

Feb. 3. LONDON, W.—Alterations at the workhouse, at 5, Woodfield Road, Harrow Road, for the guardians of the poor of the parish of Paddington. A copy of the bills of quantities and form of tender may be obtained at the offices of the architect, E. Howley Sim, Mowbray House, 14, Norfolk Street, Strand, W.C., on deposit of £3. Sealed tenders, endorsed "Tender for Alterations at the Workhouse," must be delivered before 10 a.m. on Feb. 3, to Henry F. Aveling, clerk to the guardians, guardians' offices, 313-319, Harrow Road, W.

Feb. 4. BRYNMAWR (Mon.).—Rebuilding the old Castle Inn, Brynmawr, Mon., for A. Buchan and Co., Rhymney Brewery, Rhymney. Plans and specification may be seen with T. Roderick, architect, Clifton Street, Aberdare, where bills of quantities may be obtained on application. Endorsed tenders to be sent to T. Edwards, Rhymney Brewery, Rhymney, Mon., by mid-day on Feb. 4.

Feb. 5. ABERCYNON.—Erection of a detached house at Abercynon for D. Evans. Plans and specification may be seen at the office of William Dowdeswell, architect, Treharris, and also at Greenfield House, Abercynon. Tenders, endorsed "House at Abercynon," to be delivered by Feb. 5 to D. Evans, Greenfield House, Abercynon.

Feb. 6. SCAMPTON.—Erection of a new chapel and classroom at Scampton. Plans, etc., may be seen either at Mr. Chantry's, Scampton, or the Rev. A. Morter's, 102, Burton Road, Lincoln.

Feb. 6. CHILCOMBE.—Erection of a coachman's cottage at Chilcombe, Bicknoller, near Williton, for the Rev. Cecil Martin. Drawings, etc., may be seen at offices of F. W. Roberts, F.R.I.B.A., architect, 2, Hammet Street, Taunton. Tenders to be submitted by Feb. 6.

Feb. 6. NODDFA, TREORKY. — Execution of large extensions at Noddfa Chapel, Treorky. Plans and specification can be seen at the office of Jacob Rees, architect, Pentre, and tenders to be delivered to James Thomas, provision merchant, High Street, Treorky, by Feb. 6.

Feb. 6. YNYSYPLWM, Tonyrefail.—Erection of 60 houses and 6 shops on the Ynysyplwm estate, Tonyrefail, for the Ty'ynycoed Building Club. Plans and specifications can be seen with Philip J. Jones, architect, Cilfynydd, Pontypridd, and Tonyrefail. Sealed and endorsed tenders to be sent to David Jones, secretary to the Ty'ynycoed Club, Handel House, Cilfynydd, Pontypridd, by Feb. 6.

Feb. 6. NENAGH, Co. Tipperary.—Erection and completion of a new national school, to accommodate 520 children, at the convent of Mercy, Nenagh, Co. Tipperary, in accordance with plans and specifications prepared by J. O. Moynan, M.A., M.I.C.E., and R. P. Gill, A.M.I.C.E., architects. The work is in two divisions and intending contractors may tender for one or both of the following works:—(1) Erection of school buildings and construction of sewers, etc. (2) Enclosing site and preparing grounds and footpaths. Copies of plans, etc., may be inspected at the office of the architects, and at the office of S. H. Bolton, quantity surveyor, 34, Westland Row, Dublin. Bills of quantities may be had on application to the surveyor on a deposit of £3. Sealed tenders, endorsed "Tender for Work at New School, Nenagh," will be received by Moynan and Gill, architects, Courthouse, Nenagh, signed, up to 10 a.m. on Feb. 6. Tenders, to be accompanied by priced bills of quantities in separate sealed envelope, endorsed "Quantities," and with the name of the sender.

Feb. 8. OGMORE VALE.—Erection and completion of a large hall, to accommodate about 1,000, a lesser hall, billiard room, and institute, together with reading rooms and library, at Ogmore Vale. Plans and specification may be seen at the present library, Commercial Street, Ogmore Vale, or at the office of W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff, where bills of quantities may also be obtained on deposit of three guineas. Tenders, sealed and endorsed, are to be sent to the secretary, Fred Jones, 1, Meadow Street, Ogmore Vale, by Feb. 8.

Feb. 8. BELFAST.—Erection of a building in Murray's Terrace and Athol Street, Belfast, consisting of three separate warehouses and a laundry, for the Belfast Linen Handkerchief Co., Ltd. Quantities have been prepared and may be had on application to S. C. Hunter, 2, Wellington Place, Belfast, on payment of 3 guineas. Plans, specification, and conditions of contract may be seen at the office of James A. Hanna, C.E., architect, Ocean Buildings, Belfast. Sealed tenders, endorsed "Warehouse, Murray's Terrace," to be lodged with the architect by 10 a.m. on Feb. 8.

Feb. 11. LLANFAIR P.G.—Erection of a new council school at Llanfair P.G. for the Anglesey Education Committee. Plans and specifications may be inspected at the office of Jos. Owen, F.R.I.B.A., county architect, Menai Bridge, between 9.30 a.m. and 5.30 p.m. Tenders, sealed, and endorsed "Llanfair P.G. School Tender," to be sent to R. H. Williams, secretary of education, education offices, Llangefni, by 10 a.m. on Feb. 11.

Feb. 12. LONDON.—Enlargement of the western district parcel office, and Mayfair telephone exchange, for the commissioners of H.M. Works and Public Buildings. Drawings, specification, and a copy of the conditions and form of contract may be seen on application to J. Wager, A.R.I.B.A., H.M. Office of Works, etc. Bills of quantities and forms of tender may be obtained at the undermentioned address on payment of one guinea. Tenders must be delivered before noon on Feb. 12, addressed to the secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., and endorsed "Tender for Western District Parcel Office, etc. —2nd Contract."

Feb. 13. GLASGOW.—Execution under one contract, of the excavator, brick and mason, timber, and other works, required in the construction of the office buildings, etc., at Shieldhall, for the corporation. Plans, specifications, and working drawings may be seen and specifications and schedules of quantities and forms obtained on application to the city engineer, City Chambers, 64, Cochrane Street, Glasgow, by depositing one guinea. Sealed offers, marked outside "Tender for Office Buildings, etc., Shieldhall," must be lodged by Feb. 13, with A. W. Myles, town clerk, City Chambers, Glasgow.

Feb. 15. BIRKENHEAD.—Erection and completion of extensions to the infectious diseases hospital, Flaybrick Hill, for the corporation. Plans, specifications, and particulars, can be seen, and bills of quantities and form of tender obtained, on application at the office of Charles Brownridge, M.Inst.C.E., borough engineer and surveyor, upon deposit of £1 1s. Tenders, on forms supplied, sealed and endorsed "Tender for extensions: Infectious Diseases Hospital," to be sent to James Fearnley, town clerk, town hall, Birkenhead, by 4 p.m. on Feb. 15. Sureties required. Fair wages clause.

March 2. STORNOWAY.—Erection of church spire for the Deacons' Court of the United Free English Church, Stornoway. Plans and specifications to be seen in the hands of Neil MacCallum, clerk to Deacons' Court, Stornoway, with whom sealed offers, marked "Tender for Spire," may be lodged by March 2.

No date. TYERSAL.—Slater's, plumber's and plasterer's work for twenty-three houses, Akeroyd Park, Dick Lane, Tyersal. Persons desirous of tendering should apply to I. F. Akeroyd, 31, Springfield Crescent, Lidget Green, or on the job.

No date. LEEDS.—Construction of an additional fireplace and chimney and other minor alterations at the Colton provided school, near Leeds. Specification and bill of quantities may be obtained from R. J. Smith, Education offices, Garforth, near Leeds.

No date. HIGHTOWN, Wrexham.—Erection of (1) a church at Hightown, Wrexham; (2) moving existing building and forming boundary walls. Quantities, conditions of contract, and date of receiving tenders may be obtained on deposit of 10s., from Prothero, Phillott, and Barnard, architects, 13, Promenade, Cheltenham.

No date. HAMMERSMITH.—Erection of a small concert-hall at Hammersmith. Plans supplied on deposit of one guinea. Persons desirous of tendering should apply to the architect, at Horncastle's, Cheapside, London, who will supply particulars.

No date. LLANDINAM.—Erection of a new vicarage at Llandinam for the Rev. James Jones, vicar. Plans, specification, and further particulars may be obtained on application to the architects, Deakin and Howard Jones, M.S.A., Plas Ynys, Borth, R.S.O.

No date. BIRSTAL. — Taking down Popeley House, Birstal, and the erection of outbuildings. Contractors willing to tender are requested to send their names to the architects, Joseph F. Walsh, F.S.I., and Graham Nicholas, F.R.I.B.A., Museum Chambers, Halifax.

No date. LEEDS.—Erection of two houses and alterations to premises, Hyde Park Road, Leeds. Contractors willing to tender for any of the separate works are requested to forward their names (stating trade) to Fred Mitchell, architect and surveyor, 9, Upper Fountaine Street, Albion Street, Leeds, and quantities will be supplied in due course.

No date. KELVEDON (Essex). — Execution of several alterations and additions to Prested Hall, near Kelvedon, for N. N. Sherwood. Plans and specifications may be seen at the office of J. W. Start, F.S.I., architect and surveyor, Colchester. Bills of quantities may be obtained on deposit of £2 2s.

No date. NEWPORT, SALOP.—Erection of students' hostel, at the Harper Adams Agricultural College, near Newport, Salop. Builders desirous of tendering are requested to apply to A. E. Lloyd Oswell, architect, Dana Chambers, Shrewsbury. Quantities will be supplied on deposit of one guinea.

No date. FORESTFACH.—Erection of new shops, bakery, and stables at Forestfach for the Cwmbwria Co-operative Society, Ltd. Builders desirous of tendering are requested to send their names immediately to C. S. Thomas, Meagher, and Jones, architects, 16, Wind Street, Swansea, from whom all particulars can be obtained. Fair wages clause.

No date. ANDOVER.—Erection of new premises in Bridge Street, Andover, consisting of shops, bakery, and stables, for the committee of the Andover Co-operative Society. Builders desirous of tendering are requested to send their names to the architect, R. Worcester, Co-operative Wholesale Society, Ltd., 1, Balloon Street, Manchester, with a cheque for one guinea as deposit for bills of quantity.

ENGINEERING.

Jan. 29. GLASGOW.—Construction of a steel footbridge across the river Kelvin, within the Botanic Gardens, for the corporation. Plans, sections, and detailed drawings may be seen, and specifications and forms of tender obtained, on application to the city engineer, City Chambers, 64, Cochrane Street. Sealed tenders, marked outside, "Tender for Steel Bridge, Botanic Gardens," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, by 10 a.m. on Jan. 29.

Feb. 1. MIDDLESBROUGH.—Construction of a footbridge over the railway at Cargo Fleet Road crossing, Middlesbrough, for the directors of the North-Eastern Railway. The work comprises about three tons of new steelwork, altering and erecting a pair of girders to be provided by the company, weight about 9 tons, masonry piers and timber steps. Plan and specification may be seen, and detailed quantities and form of tender obtained, on personal application at the office of W. J. Cudworth, the company's engineer, at York. Sealed tenders, marked "Tender for Footbridge at Cargo Fleet Road Crossing, Middlesbrough," must be sent by 9 a.m. on Feb. 1, to R. F. Dunnell, secretary, York.

Feb. 1. WILMINGTON.—Construction and erection of a footbridge over the Hull and Hornsea branch, near Wilmington, for the directors of the North-Eastern Railway. The work comprises about three-and-a-half tons of new steelwork, brick piers, and timber steps. Plan and specification may be seen, and detailed quantities and form of tender obtained, on personal application at the office of W. J. Cudworth, the company's engineer at York. Sealed tenders, marked "Tender for Footbridge over Hull and Hornsea Branch near Wilmington," must be sent by 9 a.m. on Feb. 1, to R. F. Dunnell, secretary, York.

Feb. 4. WOODFOOT, DUMFRIES.—Taking down the existing timber bridge over the river Annan, at Woodfoot, about two miles from Beattock Station, and supplying and erecting a new steel girder bridge of three spans, for the Lockerbie District Committee. Plans may be seen at the office of the engineers, Crouch and Hogg, C.E., 14, Blythswood Square, Glasgow, from whom copies of the specification, schedule of quantities, and form of tender may be obtained on payment of one guinea. Sealed tenders, marked "Woodfoot Bridge," must be lodged by 10 a.m. on Feb. 4, to John F. Cormack, district clerk, Lockerbie District Committee.

IRON AND STEEL.

Jan. 28. GALSTON (AYRSHIRE).—Supply and free delivery at Galston, Ayrshire, of 8-inch cast-iron pipes and special castings, for the Burgh. The contract comprises about 211 tons of pipes and specials. Copies of the specification and bills of quantities and form of tender can be obtained from the engineers, Elliott and Brown, Burton Buildings, Nottingham, on deposit of £1 1s. Sealed and endorsed offers to be delivered by first post on Jan. 28 to Robt. Blair, town clerk, Galston, Ayrshire.

Feb. 2. PENCISLEY (LLANDAFF).—Providing and laying about 1,300 yds. of 12in. cast-iron and 140 yds. of earthenware pipe sewers, with manholes, etc., at Pencisley, in the parish of Llandaff, for the Llandaff and Dinas Powis R.D.C., in accordance with plans and specification, to be seen and bills of quantities obtained on application to the engineer, James Holden, A.M.I.C.E., Park House, 20, Park Place, Cardiff. Tenders, sealed and endorsed, to be sent by noon, Feb. 2, to M. Warren, clerk, Park House, Cardiff. Sureties required.

Feb. 2. CARSHALTON (Surrey).—Supplying engineer's tools, workshop appliances and a single-phase electric motor at the children's infirmary, Carshalton, Surrey, for the Metropolitan Asylums Board, in accordance with conditions of contract and specification prepared by W. T. Hatch, M.I.C.E., M.I.M.E., engineer in-chief. Conditions of contract, specification, and form of tender may be inspected at the office of the Board, Embankment, E.C., and can be obtained upon deposit of £1. Tenders, adressed as noted on the form, must be delivered at the office of the Board, by 10 a.m. on Feb. 2.

Feb. 4. MANCHESTER.—Iron and steel work required in the extension of an elevated railway siding at Gaythorn station, for the Corporation Gas Committee. General conditions of contract, specification, and bill of quantities can be obtained on application to C. Nickson, superintendent, gas department, town hall. Drawings can be seen and any other information obtained on application to the engineer, J. G. Newbigging, M.Inst.C.E., at Rochdale Road Station. Sealed tenders, addressed to the chairman of the gas committee, and endorsed "Tender for Elevated Railway Siding, Gaythorn Station," must be delivered at the gas offices, town hall, Manchester, by noon on Feb. 4.

PAINTING.

Feb. 2. MANCHESTER.—Painting at the following places, for the Lancashire and Yorkshire Railway Co.:— (1) From Southport (Central) to Preston; (2) Wigan to Southport; (3) at Blackburn; (4) Burnley to Todmorden; (5) at the Carriage and Wagon Works, Newton Heath; (6) Newton Heath to Rochdale, and the Middleton Branch; (7) Rochdale to Sowerby Bridge; (8) Sowerby Bridge to Mirfield, and at Dewsbury Junction; (9) at Bradford; (10) at Hull. Specifications and separate forms of tender may be obtained on personal application at the engineer's office, Hunt's Bank, Manchester. Tenders, endorsed "Tender for Painting," to be in the hands of R. C. Irwin, secretary, Hunt's Bank, Manchester. by 10 a.m. on Feb. 2.

PLUMBING & SANITARY

Jan. 28. EAST BARNET VALLEY.—Making up and sewering Latimer Road (part of), Bosworth Road, and the back roads between Fergusson Road and Middle Road, within the East Barnet Valley Urban District, for the U.D.C. Plans and specifications may be seen and form of tender obtained on application to Henry York, A.M.Inst.C.E., the council's surveyor, at the council's offices, New Barnet. The contractor will be required to give security in accordance with the Public Health Act, 1875, for performance of contract. Sealed tenders, endorsed "Tender for Making up Roads," addressed to the Chairman of the Works Committee, at the council offices, Station Road, New Barnet, must be delivered before 4 p.m. on Jan. 28.

Feb. 2. TAUNTON.—Construction of about 780 lineal yds. of 12 in. pipe sewer, for the corporation. from Staplegrove Road to Station, through Chip Lane, together with all necessary manholes, etc., complete. Plans may be seen, and specification, quantities and forms of tender obtained from D. Edwards, A.M.I.C.E., borough engineer and surveyor, Municipal Buildings, Taunton. The successful competitor will be required to employ as far as possible Taunton men. Tenders, endorsed "New Sewer," are to be delivered under seal and addressed to the town clerk, Municipal Buildings, by noon on Feb. 2.

Feb. 3. HEMEL HEMPSTED (Herts).—Boring at the waterworks pumping station, Marlowes, Hemel Hempsted, Herts, for the corporation. Plans, specifications, and bills of quantities may be obtained at the office of Walter R. Locke, corporation waterworks engineer, town hall, Hemel Hempsted, on deposit of £5. Sealed tenders, endorsed "Tender for New Bore Hole," must be delivered to Lovel Smeathman, town clerk, town hall, Hemel Hempsted, by 5 p.m. on Feb. 3.

Feb. 4. EDINBURGH.—Construction of a new 2 ft. by 3 ft. egg-shaped brick and concrete sewer for West Merchiston and Gorgie districts, 10 yds. or thereby, constructed in open cut and 314 yds. or thereby in tunnel, all conform to plans, specification, general conditions of contract, and schedule of measurement prepared by the burgh engineer, from whom schedules of measurement and all particulars may be obtained. Sealed offers, endorsed "Tender for W. Merchiston and Gorgie District Drainage," accompanied with priced schedule, must be lodged before 10 a.m. on Feb. 4, with Thomas Hunter, W.S., town clerk, City Chambers, Edinburgh.

ROADS AND CARTAGE.

Jan. 28. FULHAM.—Supply of 600 tons of Guernsey granite spalls (large) for early delivery, for the guardians of the poor. Tenders, upon printed forms to be obtained of E. J. Mott, clerk to the guardians, guardians' offices, 129, Fulham Palace Road, Hammersmith, W., or by forwarding a stamped addressed foolscap envelope, must be sent in by 10 a.m. on Jan. 28, sealed and endorsed "Tender for Granite."

Jan 30. CHINGFORD.—Supplying (1) broken Queenast, Leicester, or Guernsey granite, in trucks at Chingford station, as required; (2) supply and delivery of stone ballast and hoggin at per cube yard; (3) use of steam roller and scarifier, and the necessary labour in connection therewith, as required, at per day of 8½ working hours, for the U.D.C. Forms of tender may be had on application, and copies of the several contracts can be seen at the council offices during office hours. Contracts will be for the twelve months ending March 31, 1910, and all tenders must be sealed and delivered by noon on Jan. 30 to Leonard C. Bowen, clerk to the Council, 34, Station Road, Chingford, endorsed with the name of the article tendered for.

Feb. 1. DERBY.—Supplying broken granite basalt, limestone, slag, or other suitable materials required for the main roads, for the County Council, delivered at various railway stations and wharves in the county, during the year ending March 31, 1910. Form of tender and conditions of contract may be obtained at the surveyor's office, and will be forwarded through the post on receipt of a stamped addressed foolscap envelope. Tenders are to be delivered by Feb. 1, to J. W. Horton, A.M.I.C.E., county surveyor, county offices, St. Mary's Gate, Derby.

Feb. 1. YARDLEY.—Widening, making up, kerbing, channelling, and path paving various roads, for the R.D.C. Plans, specification, and conditions of contract may be seen and quantities and forms of tender obtained, on application to Arthur W. Smith, engineer, and surveyor to the Council, at the council house, Sparkhill, near Birmingham, between 10 and 1 and 3 and 5 (Saturdays 10 and 1), on deposit of three guineas to the clerk. Sealed tenders, addressed "The Yardley Rural District Council," and endorsed "Paving Scheme, 3," to be delivered by noon on Feb. 1, to Francis Ladbury Thompson, clerk of the council, Council House, Sparkhill. The contractor whenever possible must give preference to competent workmen as may be residents of Yardley. Fair wages clause.

Feb. 2. BRENTFORD.—Supply of 300 yds. of blue Guernsey granite, hand-broken to a gauge of 2 in., for the U.D.C. Forms of tender, together with specification and conditions, may be obtained on application to J. W. Croxford, surveyor, Clifden House, Boston Road, Brentford, between 10 a.m. and 5 p.m., week days, except Saturdays, and on Saturdays between 10 and 1. Tenders to be delivered to Step. Woodbridge, clerk, New Brentford, by noon on Feb. 2, marked "Tender for Granite."

Feb. 2. CHEAM.—Making up Frederick Road, Cheam, for the Epsom R.D.C. Plan and specification and form of contract may be seen at the office of the surveyor of highways, T. E. Ware, Waterloo Road, Epsom, where forms of tender and other particulars may be obtained. Tenders on the form issued by the council muct be received by Arthur R. Cotton, clerk, Waterloo Road, Epsom, by 7 p.m. on Feb. 2, endorsed "Tender for Frederick Road."

Feb. 2. HATFIELD.—Supply of broken granite and slag required for the main roads during the year ending March 31, 1910, for the Hertfordshire County Council. Forms of tender and condition of contract may be obtained on application to Urban A. Smith, M.I.C.E., county surveyor, county surveyor's office, Hatfield, or will be sent through the post upon receipt of a stamped addressed foolscap envelope. Tenders, upon forms provided, to be delivered by Feb. 2.

Feb. 2. TAUNTON.—Carrying out street improvement works in the following streets, for the corporation: Belvedere Road (West) and Clarence Street. Plans and specifications may be seen, and form of tenders obtained from D. Edwards, A.M.I.C.E., borough engineer, Municipal Buildings, Taunton. Tenders, endorsed "Street Improvement Works," are to be delivered under seal and addressed to the town clerk, Municipal Buildings, by 10 a.m. on Feb. 2.

Feb. 3. BARKING.—Execution of kerbing, channelling, flagging, etc., at Ripple Road within the district, for the U.D.C. Plans may be seen and specification, quantities, and form of tender obtained from C. F. Dawson, surveyor to the council, public offices, Barking. Tenders, endorsed "Tender for Ripple Road Paving," may be delivered to the highways and buildings committee at 7 p.m. on Feb. 3, or delivered to H. Hargreaves, clerk of the council, public offices, Barking, Essex, before the time mentioned. Surety required. Fair wages clause.

Feb. 4. ISLE OF ELY. — Supply of broken materials for the repair of main roads for the year ending March 31, 1910, for the C.C. Specifications and form of tender can be obtained upon the receipt of a stamped addressed foolscap envelope at the offices of H. Farr Simpson, county surveyor, northern division, Wisbech; R. S. W. Perkins, county surveyor, southern division, Ely. Tenders to be sent before 10 a.m. on Feb. 4.

Feb. 4. HOUNSLOW.—Execution of the following works:—(1) Making up Campo Road, Hounslow. (2) Making up Ailsa Avenue, St. Margaret's, for the Heston and Isleworth U.D.C. Plans, sections, and specification may be seen, and bills of quantities and form of tender obtained from J. G. Carey, engineer and surveyor, council house, Hounslow, on payment of £1 1s. Sealed tenders, on the form provided, must reach H. J. Baker, clerk, council house, Hounslow, by noon on Feb. 4, endorsed, as the case may be.

Feb. 6. CHELMSFORD. — Supply of Norway granite kerb and setts, for the year ending March 31, 1910, for the Essex County Council. Forms of tender and special envelope, and all other information and particulars, can be obtained at the chief surveyor's office. Tenders to be delivered by Feb. 6, to Percy J. Sheldon, M.Inst.C.E., chief surveyor, office of the chief surveyor, Chelmsford.

Feb. 8. GLANFORD, BRIGG.—Leading road material between April 1, 1909, and March 30, 1910, for the R.D.C. Forms of tender may be had on application to Frank C. Hett, clerk, to whom all tenders must be delivered by Feb. 8.

Feb. 8. HOLLAND (Lincolnshire).—Supplying about 15,288 tons of broken granite, 240 tons of granite chips, 1,450 tons of broken slag, 465 tons of coarse builders' sand, for the C.C., to be delivered at the different railway stations in the county. Conditions and forms of tender may be obtained of the clerk. Sealed tenders to be sent to H. Chaderton Johnson, clerk of the C.C., office of the clerk, Sessions House, Boston, marked "Tender for Granite, Slag, or Sand," by 10 a.m. on Feb. 8.

Feb. 9. POTTERSPURY.—Supply of granite (broken and unbroken), and slag for the year ending March 31, 1910, for the R.D.C. Forms of tender, with quantities required, and full particulars, may be obtained on application to James B. Fairchild, Potterspury, Stony Stratford, surveyor to the council. Tenders, marked "Tender for Materials," to be sent by Feb. 9, to W. R. Parrott, clerk to the council, High Street, Stony Stratford. Samples of stone to be delivered at the workhouse, Yardley Gobion, by Feb. 9.

Feb. 10. BRADFORD.—Supply of about 20,000 tons of road metal, required for the macadamised roads within the city, for the corporation. Form of tender may be obtained on application at the office of W. H. S. Dawson, city engineer and surveyor, town hall. Sealed tenders, endorsed "Tender for Road Metal," to be sent to Frederick Stevens, town clerk, town hall, Bradford, by Feb. 10. Fair wages clause.

Feb. 13. BATH.—Supply of granite and basalt in lump; also macadam and chippings, for the county main roads, to be delivered to the various stations, wharves, and sidings, during the financial year ending March 31, 1910, for the Somerset county council. Specifications, schedule of approximate quantities required at the various stations and wharves, and forms of tender can be obtained upon application to the county surveyor, Bath. Sealed tenders, endorsed "Tender for Road Material," and samples of the macadam to be delivered by Feb. 13, to H. T. Chapman, county surveyor, 1, Chapel Row, Queen Square, Bath.

Feb. 17. GLOUCESTERSHIRE.—Supply of stone for use on main roads for the year beginning April 1, 1909, and ending March 31, 1910, for the County Council. Forms of tender can be obtained from the county surveyor. Tenders must be delivered by Feb. 17th, marked outside "Tenders for Material," to E. S. Sinnott, M.Inst.C.E., county surveyor, Shire Hall, Gloucester.

Feb. 22. LITTLE HULTON, near Bolton. — Supplying broken granite, grit setts, granite and limestone chippings, grit kerbs, artificial and natural flags, stoneware pipes and gullies, cement, steam road rolling and scarifying, disinfectants, pitch and oil, for the U.D.C. Forms of tenders and particulars can be obtained from James H. Heyes, clerk, council offices, Little Hulton, near Bolton, any day between 9 a.m. and 5 p.m. Tenders, sealed and endorsed "Tender for ——," to be delivered at the council offices by 4 p.m. on Feb. 22.

March 2 MERIONETH.—Maintenance and repair of the rural main roads of the county, for the C.C. Particulars, specifications, bills of quantities, etc., may be obtained on application to E. Vaughton, county surveyor, Arthog, Dolgelley. The county is divided into 4 districts, and intending competitors may tender for any or all. As it has not been definitely decided whether the contract will be let for a period of 1, 3, or 5 years, tenders must be sent to cover each of those periods. Tenders to be delivered to David Breese, clerk to the council, Portmadoc, by 10 a.m. on March 2.

MISCELLANEOUS.

Jan. 28. GRAYS THURROCK.—Supply and delivery of 435 yds., or thereabouts, of stoneware pipes, and 500 lin. yds. or thereabouts of concrete pipes, for the U.D.C. Full particulars of the sizes required, together with specification and forms of tender may be obtained on application to the council's surveyor. Tenders, endorsed "Tender for Stoneware (or Concrete) Pipes," as the case may be, to be deposited by noon on Jan. 28, with Hatten and Asplin, clerks to the council, Urban District Council Offices, Grays.

Jan. 29. EXETER.—Supply of building materials to the Devon County Asylum for the half-year ending June 30, 1909. Forms of tender to be obtained of E. H. Harbottle, F.R.I.B.A., County Chambers, Exeter, to be signed, sealed, and delivered to the clerk of the asylum by Jan. 29, endorsed on the outside "Tender for Building Materials."

Jan. 29. LONDON, S.W. — Removing plaster from the ceilings of the men's and women's swimming baths in Manor Street, and substituting therefor 7-8 in. yellow deal or pitchpine matchboarding, for the Chelsea B.C., in accordance with specification, which may be seen at the office of T. Holland, town clerk, town hall, King's Road, Chelsea, S.W., between 10 and 5 daily (Saturdays 10 and 1). Persons tendering must state separately in their tenders the difference in the cost of the work if carried out in pitch-pine instead of yellow deal. Tenders to be delivered in sealed envelopes, endorsed "Tender for Repairs, Public Baths," at the town clerk's office, by noon on Jan. 29.

Feb. 1. RICHMOND, SURREY.—Supplying about 1,000 yards of stoneware pipes, 15 inches and 18 inches in diameter respectively, fitted with Hassell's double-lined safety joint, for the Corporation. Conditions of contract may be inspected, and a copy of the specification and form of tender obtained on application to J. H. Brierley, borough surveyor, town hall, Richmond, Surrey. Sealed tenders, properly endorsed, to be delivered by 4 p.m. on Feb. 1, to Henry Sagar, town clerk, town hall, Richmond, Surrey.

No date. HURWORTH-ON-TEES.—Pulling down and rebuilding the Emerson Inn, Hurworth-on-Tees, for the proprietor of the City Brewery, Durham. Contractors desirous of tendering must send names and addresses, together with the trade or trades they require, to W. T. Aggutter, architect, Horse Market, Darlington, who will supply bills of quantities and other information.

THE
Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
30, Cross Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ADVERTISER (28), seeks re-engagement, ten years' thorough practical knowledge of building, estate management, and repairs, etc.; experienced in preparing plans and estimates, including quantities, for new works: highest refs. — Y., 86, Coniston Road, Muswell Hill, N. 4805

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill. 4809

ARCHITECT'S Assistant (24), 4 years in present situation, 8 years' experience, town and country, will be disengaged on Feb. 1st.—G. G. S., 39, Caithness Road, West Kensington Park, W. 4774

ARCHITECT and Surveyor's Assistant desires engagement; 6½ years' sound provincial experience; good draughtsman, working drawings, details, colourist; perspectives, surveying, levelling; assist quantities; general routine, specimen drawings; highest references; moderate salary.—S. Osgood, Chelsfield Park, Orpington, Kent. 4801

ARCHITECT and Surveyor's Assistant (25), six years' London experience, design, surveying, quantities, Hon. Building Construction Inter.R.I.B.A.; excellent references; salary £2 2s.—Apply Box 4780, Builders' Journal Office.

ARCHITECT'S Assistant, age 27, desires engagement, permanency preferred; good draughtsman, and capable at working drawings, details, perspectives, water-colour, and pen and ink, assistance with specifications, quantities and general work, levelling and survey; salary 30s.—Apply Aubrey Leonard Pritchard, Bryn Derwen, Rhyl, North Wales. 4709

ARCHITECT'S Assistant (23), over 6 years' experience in various London offices; good references.—G. O. E., 72, St. Ann's Hill, Wandsworth, S.W. 4790

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECT'S Assistant (23), late pupil, seven years' all-round experience, been clerk of works, working drawings, details, etc., knowledge of quantities and perspective.—E. P. Lee, 631, Commercial Road, London, E. 4781

ARCHITECTS, builders, estate agents (19), good energetic draughtsman, tracing, colouring, working drawings, etc.; willing to assist in office work; references.—F. J. Williams, 89, Shrubland Street, Leamington Spa, Warwickshire. 4796

ARCHITECT'S good all-round Assistant; 10 yrs.' exp. North, South, and Wales; quams., details, working drawings; mod. salary.—W. T., 14, Stanhope Road, Stockton-on-Tees. 4798

ARCHITECT'S assistant (23), over 7 years' London and Provincial experience; excellent references; Inter.R.I.B.A. Exam. — H. J. Wilson, "Brinkdale," Park Road, Peterborough. 4670

ARCHITECT'S Junior Assistant desires engagement in London; 6 years' experience, contract drawings, details, and measuring; moderate salary.—Box 4737, Builders' Journal Office.

ARCHITECT'S Junior Assistant (19), 4 years experience in West End Office, working drawings, details, perspectives, competitions, excellent references; salary 21s.—Box 4777, Builders' Journal Office.

ARCHITECT'S Assistant (23), seven and a quarter years' varied London and provincial experience. First-class draughtsman, details, surveying, and general routine. Excellent references. Inter. R.I.B.A.—H. J. Wilson, 90, Park Road, Peterborough. 4812

ARCHITECT'S, Surveyor's or Builder's Assistant (23), Inter.R.I.B.A., good draughtsman, levelling, surveying, specifications, assist quantities, supervision, estate work, correspondence, accounts; excellent references; moderate salary.—H. O'R., 80, Lavender Sweep, Clapham, S.W. 4810

ARCHITECT'S Assistant, thoroughly experienced, temporary employment; domestic work, business premises, schools, etc.; surveying and levelling, etc.; two years' experience in Structural Engineer's office; salary moderate. — Box 4820, Builders' Journal Office.

ARCHITECT, estate agent, or builder's assistant, experienced in all branches; good references.—R. S., Eagle House, Marine Parade, Clacton-on-Sea. 4816

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, Builders' Journal Office.

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Box 4815, Builders' Journal Office.

ARCHITECT'S son, 10 years' office experience, wishes to take up agency or post as representative in Lancashire, or North of England, to well-known firm in any special line of Building trade. —Apply Box 4585, Builders' Journal Office.

AS Clerk, cashier, depot manager, or any position of trust, 11 years' experience, builder's and coal merchant's trade; age 25; good penman; also reference: moderate salary.—Box 4659, Builders' Journal Office.

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

BUILDER'S general foreman, advertiser seeks engagement; 16 years' service as above with first-class London firm on important and various works; good references.—Address H., 150, Effra Road. Wimbledon, S.W. 4703

BUILDER'S or architect's assistant, 25, desires re-engagement, drawing, typewriting, shorthand, correspondence, accounts, and general office routine; also assist in quantities; excellent references, moderate salary.—Apply Box 4756, Builders' Journal Office.

BUILDERS' Assistant desires work; plans, estimates, setting out buildings, measuring up, prime costing, surveying, and levelling plots, ordering exact quantities, materials; 11 years' experience.—Box 4803, Builders' Journal Office.

BUILDER'S Assistant disengaged, 21 years' experience; office routine, plans, specifications, quantities, supervision, measuring up, levelling, and surveying; good references; abstainer.—L. J. Greaves, Prestwood, Great Missenden, Bucks. 4717

CLERK of Works seeks re-engagement; just finishing public building; varied experience, notably ferro-concrete construction; well recommended; testimonials most excellent; age 45.—A. B., Box 4814, Builders' Journal Office

CONTRACTOR'S outdoor manager and surveyor desires engagement; present situation 17 years; age 37; keen on variations; expert in measurements; all trades, quantities, estimating; town or country.—W., 2, Dalberg Road, Brixton. 4776

ESTATE, Buildings Manager (33), **desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.**

ENGINEER, general, wants permanent appointment, official or private staff; thorough all-round experience; electrical, plumbing, smith, married, 34; good testimonials.—86, Bathurst Gardens, Willesden. 4704

ESTATE Owners.—Bricklayer, all-round, stone-waller, and general repairs; abstainer; good references; moderate wage for permanency.—Quinton, 12, Holland Road, Aston, Birmingham. 4802

FIREPROOF Engineers and Concrete Specialists. Advertiser, connected with above trades for 10 years, and whose name is well known in connection with same, desires position as manager, traveller, or head clerk; first-class book-keeper; aged 33; very moderate salary.—P. W. Potter, 73, Penshurst Road, Thornton Heath. 4719

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, Builders' Journal Office.

FOREMAN Painter (working) seeks re-engagement); experienced in all class work in building trade, as for general alterations, etc.; good supervisor, and reliable; either town or country; abstainer.—X. Y. Z., 8, Barton Street, Westminster. 4807

GENERAL Foreman seeks re-engagement, thoroughly practical in all branches; trade, carpenter and joiner, good draughtsman, first class references; town or country.—A. J., 196, Murchison Road, Leyton. 4804

GENERAL Foreman seeks re-engagement, town or country; thoroughly practical in all trades; energetic, reliable and good manager of men; good references.—E. C., 15, Park Road, Merton, S.W. 4778

GENERAL Foreman seeks re-engagement; alterations or new, practical experience in all branches; carpenter and joiner; good references; age 36; moderate wages.—Caplen, 3, Victoria Mansion, Edgware Road, Paddington, W. 4779

GENERAL Foreman seeks re-engagement, thoroughly practical and reliable; new or alterations; carpenter and joiner; life abstainer; first-class references.—Foreman, 3, Hawbridge Road, Leytonstone. 4787

JUNIOR Assistant desires situation, home or abroad; good practical knowledge of construction and details; competent draughtsman and colourist, working drawings, measuring and supervising, surveying and levelling; moderate salary.—Box 4613, Builders' Journal Office.

PLUMBING, etc., Sanitary or Lead-laying, job wanted, day or piecework; anywhere; lowest prices; best work; excellent references; used to speculating or jobbing.—Squirrell, 47a, Woodland Street, Dalston, N.E. 4749

QUANTITY Surveyor's Assistant (21), 4 years' experience, desires engagement, certificates and good references. — Apply Box 4745, Builders' Journal Office.

QUANTITY Surveyor's Assistant, temporary assistance rendered in taking-off, measuring variations, land surveys, dilapidations, etc., by experienced surveyor; references. — Box 4808, Builders' Journal Office.

REINFORCED concrete foreman, **disengaged, long and varied experience, especially in Kahn bars and expanded metal, timbering a speciality; carpenter by trade; good refs.—G. C., 59, University Road, Tooting, London. 4721**

R.I.B.A. Final Exam., 7 years' experience, 1½ in Paris; good all-round man requires berth at home or abroad; good refs.; salary moderate.—Box 4799, Builders' Journal Office.

SLATING and tiling wanted (labour only) day or piece; any quantity, large or small; distance no object.—Mack, Slater and Tiler, 3, Granville Cottages Tower Hamlets Street, Dover. 4619

SURVEYOR'S, Architect's Assistant (27), good. varied architectural, municipal and engineering experience; contract drawings, details, assist quantities, surveys, levels, etc., houses, schools, works, sewage works, roads, etc. Salary £2 5s.—Box 4811, Builders' Journal Office.

SHOP or General Foreman, long West-end experience, used to alterations and repairs; understands stairs; used to good jobbing work. Address A., c/o Mr. Seymour, 14, Allsop Place, Regent's Park, N.W. 4586

TO Builders.—Situation as improver wanted by young man just out of his time; technical student; neat draughtsman; assist with quantities, supervision, etc.; abstainer. — Box 4662, Builders' Journal Office.

TO Estate Owners, builder, experience, in all trades, desires position as manager (working or otherwise); plans prepared, quantities, setting out, accounts and supervision; abstainer; country preferred.—Box 4806, Builders' Journal Office.

VOLONTAIRE.—Foreign gentleman (21) desires position in builder's office, with opportunity of learning.—B. B., 43, Bolingbroke Grove, Wandsworth Common, S.W. 4789

Appointments Vacant.

BUILDER'S Assistant for the Midlands. Must be a thoroughly competent man, smart and energetic, well up in supervision; measuring up, levelling surveying, and checking off sub-contractors. Send copies of three references, stating age and wages required for permanency to Box 4813, Builders' Journal Office.

JUNIOR Clerk for builder's office in North London, shorthand, typewriting, and accuracy in figures essential; early hours. — Box 4783, Builders' Journal Office.

REPRESENTATIVE Wanted by City Firm of Heating Engineers; must have connection amongst architects and practical knowledge of the business. Permanent situation with good salary to fully qualified man; state age and experience, with all particulars, to Box 4821, Builders' Journal Office.

WANTED, Traveller, to offer article in great demand for schools, hospitals, dwellings, specified by all eminent architects throughout the United Kingdom; commission. — "Sanatorium Iron Air Brick Co.," 58, Denmark Road, Southport. 4818

February 3, 1909. Volume 29. No. 5.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: Visionary London; Housing the Londoner; Feasts of Reason - - - - - 85
The Education of the Architect - - - 86
The Board of Professional Defence - - 86
Criticism of Work submitted for Institute Prizes. By Paul Waterhouse, M.A., F.R.I.B.A. - - - - - - - - 87
Planning the Hague Peace Palace Gardens. By T. H. Mawson, Hon. A.R.I.B.A. - 87
Notes on Competitions - - - - - - 88
Reason in Building - - - - - - - 88
Enquiries Answered - - - - - - - 89
The Stability of Walls. By Prof. Henry Adams, M.Inst.C.E., etc. - - - - - 90
Proposed New Works - - - - - - 92
Proposed London Buildings - - - - 92
Works in Progress and Completed - - - 92

CONCRETE AND STEEL SECTION.

Earthquakes and Frame Buildings - - - 93
Making Cement without Burning all Ingredients - - - - - - - - - 93
A Reinforced Concrete Aqueduct. By Robert S. Walker - - - - - - - - - 94
Monolithic Construction and Methods of Calculating Stresses - - - - - - - 96
Taking out Weights in Ironwork. By A. E. Fletcher - - - - - - - - - 97
The Government's Output in Public Works - 98
Reinforced Concrete Systems: The Chain System - - - - - - - - - 98
Reinforced Concrete in Foundations. By Vere Sussex Hyde - - - - - - - - 100
Notes and News - - - - - - - - 103
Architectural Societies - - - - - - - 105
Tenders - - - - - - - - - vi., viii.
Complete List of Contracts Open - xxvii.-xxix.
Views and Reviews - - - - - - - 105
Federation News - - - - - - - - 106
Trade and Craft - - - - - - - - 106
Coming Events - - - - - - - - 106
New Companies - - - - - - - - 106
List of Official Appointments Vacant - - 106

ILLUSTRATIONS.

Gibbs Windows, centre plate. John Belcher, R.A. - - - - - - - - - - 87
Stability of Walls - - - - - - - - 91
A Reinforced Concrete Aqueduct; Old Aqueduct with Sluice Gate open to Drain Canal, 94; Driving Foundation Piles for Buttress Walls, 94; Works Submerged during Flood of River, 95; "Hole" full of Water, showing Pile Driver Immersed to Smoke Stack, 95; Water Rushing over Arch after Coffer-dam had given way, 95; New River Bed and Panel Forms, 95; Section of Forms for Beams, 95; Middle Wall Completed, and Forms of Side Walls in Position, 96; Panel Construction of Forms for Walls, 96.
Chain Concrete Construction: Floor of School at Castleford - - - - - - - - 98
Storage Reservoir, Pudsey (Chain Concrete Reinforcement), Jowett Kendall and Son, Engineers - - - - - - - - - 99
Bank Strong-room in Leeds (Chain Concrete System), Carby, Hall, and Dalby, Architects - - - - - - - - - - 100
Reinforced Concrete in Foundation - - - 100
Cottage at Preston Deanery, Herbert Norman, Architect - - - - - - - - 103

Visionary London.

If, and when the Towns Planning Bill comes into operation, London can be immediately "laid out." it will only be necessary to appoint assessors to pronounce upon the scores of schemes that have been already committed to paper—or cloth. Mr. C. Lewis Hind, writing in the "Daily Chronicle" the other day, describes how, with the object of discussing the beautification of London, he met at a restaurant a gentleman who, "being an artist as well as an architect" (but surely these things are one), neglected his devilled kidneys, pushed his plate aside, and drew "spidery pictographs" on the table-cloth, showing how he would improve Battersea Park and Trafalgar Square. "See," said the artist, "here is the open river promenade along the water front. You arrive by boat; you enter the gardens from the long flight of water steps in the centre; you approach a great area with a bandstand on the axial line of the grand avenue; you find concert-halls, picture galleries, winter gardens, covered loggias, tennis lawns, a stadium for sports, a lake—in fact, a permanent pleasure garden for London." Incidentally you find the money for these things; but that is a mundane consideration that the artist-architect seems to have swept aside with the devilled kidneys, which, on a table-cloth, ought to have appealed to him as a well-conceived design for an interior. But Battersea Park thus glorified is a delightful vision; and whether or not, or how soon or how late, it is realised, depends on the rate at which the art education of the public may proceed, and the height and depth and breadth to which it may ultimately extend. Trafalgar Square is to become the finest feature of the first city of the Empire—the architectural commemoration of our sea-power. If, and how soon, this dream is to be realised depends very largely—does it not?—on the influence of our sea-power in preserving the peace of the world, and of thus conserving for expenditure upon the arts of peace a modest modicum of the nation's wealth. Mr. Hind, by the way, evidently loves London—or some of it—as it is, whether or not he indulges in visions of what it might be; and he very rightly contends that "for better or worse, we cannot dissociate architecture from London's strange and ever-changing atmospheric conditions. His admiration for the Nelson Column may perhaps be forgiven in consideration of his rather poetic rhapsody over Somerset House. This, he says, "is the exterior of my choice, seen from the Thames at twilight, detail gone, solemn as a prayer, barely a century and a quarter old, the dignity and reserve of the building growing every year lonelier and more detached from its assertive modern companions. When Sir William Chambers raised the prison-like palace, did he think that in the year 1909 we should prize it as one of the supreme architectural relics of elder London?" Certainly it is a fine piece of masonry; and some very competent sculptors—Carlini, Wilton, Geracci, Nollekens, Banks, Bacon, and Flaxman—assisted in its decoration. Elmes thought that the style was "refined to a degree scarcely excelled by Palladio himself; and Chambers was careful to go to Rome for models for his Ionic, Composite, and Corinthian capitals. It must not be overlooked by students, however, that there are parts of the building for which Chambers is not to be held responsible. The west wing facing Wellington Street was finished by Pennethorne; and the north end was not finished until 1853, Chambers having died in 1796. It was in the old Somerset House that Inigo Jones, in 1653, breathed his last. But the popular attitude towards art and beauty is subtly suggested by the last sentences of Mr. Hind's interesting article: "As we rose, the waiter swept the cloth from the table—a little hastily, I thought."

———

Housing the Londoner.

The report on housing recently issued by Mr. E. Harper, the statistical officer to the London County Council, confirms certain popular impressions with respect to the development of London, and others it corrects. The tendency of the population to forsake the centre and radiate towards the suburbs is, of course, well marked and indisputable. Cheap and plentiful means of transit enable the merchant and the workman to avail themselves of the cheaper rents and purer atmosphere of the suburbs; and, indeed, the cheaper rents and lower rates prevailing beyond the boundaries of Greater London have induced many comparatively well-to-do persons to go much farther afield than the suburbs, so that thousands of prosperous city gentlemen find it pleasant and convenient to live from twenty to fifty miles out—preferably near good golf links. This movement is no doubt largely responsible for the rise and extension of the excellent school of domestic architecture that, while insufficiently appreciated at home, is greatly admired by our friends abroad, who envy the English architect his opportunities, and congratulate him on the admirable use he has made of them. With regard to working-class dwellings, Mr. Harper corrects the exaggerated notion commonly entertained that in this direction private enterprise has been almost completely paralysed by municipal action. He states that, as a matter of fact, during the past six years private enterprise has provided ninety-three per cent. of the accommodation. The present position of the Council in this matter is thus summed up in the report: "If by any means the provision of houses by private enterprise can be further stimulated, the scope of municipal house building might then without danger be limited to (a) The building of dwellings which should serve as models to private enterprise; and (b) The provision of accommodation for any particular class or locality which appeared to be neglected by private enterprise." Building owners and speculative builders may still maintain the ultramontane theory that a municipality has no moral right to interfere at all; but, since the Works Department has been abolished, the non-speculative builder will not feel greatly disposed to quarrel with the reasonable attitude and the comparatively modest tone that the present Council has seen fit to adopt.

———

Feasts of Reason.

The value of that immemorial and immortal institution, the after-dinner speech, is greatly underrated. It is too often the subject of "fleers and jibes and notable scorns." Unctuous the eloquence may usually be, but this particular quality should only serve to make more plausible the saying of Dr. Johnson, that "a dinner lubricates business." The speaker becomes more expansive and candid, the hearer more receptive and tolerant. It may therefore be regarded as fortunate that of all men, architects and builders seem most addicted to the dinner habit, perhaps because they are more clubbable or gregarious than other men, but more probably because they form an exceedingly large section of the community, and because, since in the nature of things, their sayings and doings are always of public interest, the press gives greater publicity to the speeches delivered at their formal dinners. The winter being—in spite of certain sceptical denials—the slackest season for the builder, formal dinners are at present very prevalent, and, on the whole, they are proving very prolific of wise and effective utterance, the inevitable "dreary commonplace observations" being but as the sand to the mortar. At builders' dinners we have had, lately, some quite statesmanlike pronouncements on such matters of pith and moment as municipal trading, the decay of apprenticeship, the fair wages clause, the drafting of public contracts. At these symposiums architects are always present, and nearly always contribute something material to "the feast of reason." At their own dinners they are rather more given to "the flow of soul." It is there that we are treated to really coruscating little essays in æsthetics and in professional ethics. Take as a recent and quite an average example the speeches at the annual dinner of the Leeds and Yorkshire Architectural Society, which was held at the Queen's Hotel, Leeds, on January 28th. Mr. E. Kitson Clark, president of the Leeds Philosophical Society, in proposing the toast of "The Royal Institute of British Architects," said, with as much felicity as truth, that "the architect turned simple handicrafts into arts, and conferred upon the world the greatest pleasure, the greatest inspiration and the greatest delights of sacred memories." After this flight into the empyrean, Mr. Clark seems to have felt that he had qualified for censorship of the smoke nuisance! Mr. Paul Ogden, F.R.I.B.A., president of the Manchester Society of Architects, who was among the guests, urged the importance of giving the architect a better education and a higher status. The universities throughout the United Kingdom, he said, were going "to tackle architecture as he believed it ought to have been tackled by the R.I.B.A." He has faith in the power of the universities to place the architect on a level with the medical and legal professions. That may very well be. The universities can equip the architect with scholarship; but what about art? Is it communicable by any method known and approved at the universities? We are not at all combating Mr. Ogden's contention, but are simply venturing to suggest that architects should be very careful to steel themselves against the mere glamour of a university career. We do not object to their capturing the universities; but they will have to see to it that the universities do not capture them. To put the matter very frankly, it seems to us that the university curriculum in architecture may be easily more academical than practical. At all events, the majority of architects, debarred by circumstances from studying at a university, would be sure to console themselves with this belief. They would derive some comfort, too, from this remark by one of the speakers who followed Mr. Ogden: "We had instances of architects animated by the highest conception of art, but we did seem to lack—it was the fault of the spirit of the age—those higher ideals which had produced in the past buildings to which we looked back with reverence that was all the greater when we recollected that architecture was not taught then in that perfect manner in which they hoped it would be taught in the Leeds University." This is to say, that the old architects did very well without academical training. And this gentleman's phrase, "looked back with reverence," is perhaps more significant than he intended it to be. Future generations will no doubt "look back with reverence" on some of the slighted buildings of to-day, and commend our "higher ideals." But these professional and trade dinners certainly present us with abundant food for thought. We are glad that they are so numerous, and we are sorry that most of them seem to be held "up North." Why is the South less gustatory?

THE EDUCATION OF THE ARCHITECT.

We believe we are justified in stating that a considerable portion of the community is gradually realising the fact that unless some immediate effort is made to institute a thoroughly efficient scheme of architectural education in this country, much of the work of the future, which should (and undoubtedly would in more favourable circumstances) be placed in the hands of English architects, will fall into those of their better trained and more highly educated confreres of other nations. There can be no doubt, if our national architecture is to ultimately attain any considerable measure of artistic success, that the present-day unscholarly methods of design will have to be altogether abandoned, and recourse, once again, be had to the close study of the many magnificent structures in Greece and Italy under the influence of which Inigo Jones, Wren, Gibbs, Chambers, and other artists of the 17th and 18th centuries produced their great and lasting works. To re-establish that national tradition, in all its real and scholarly significance, should be the aim of every architect who has the welfare of his profession at heart. The old-time system, whereby the student entered an architect's office for a term of pupilage of from three to five years, is rapidly becoming obsolete and, unfortunately, the various architectural schools which are springing up throughout the kingdom may not form efficient substitutes. In the former method of acquiring the requisite knowledge of his profession, the student is generally left far too much to his own devices, and, in his principal's absence, the amount of tuition he receives is, sometimes, altogether dependent upon the good will, or leisure, of the senior member of the office staff. Our main objection to the latter system of education (i.e., that embodied in the course of training afforded to the now numerous students of the architectural schools) is due to the fact that the studies are not necessarily directed nor personally controlled by men of great practical experience in architectural work. What is required is a system of training, modelled on that of the *Ecole des Beaux-Arts*, which combines the best elements of the two methods of training to which we have referred—so organised that, from its commencement to its close, the students' education is under the personal control of an architect who has long been engaged in the active exercise of his profession.

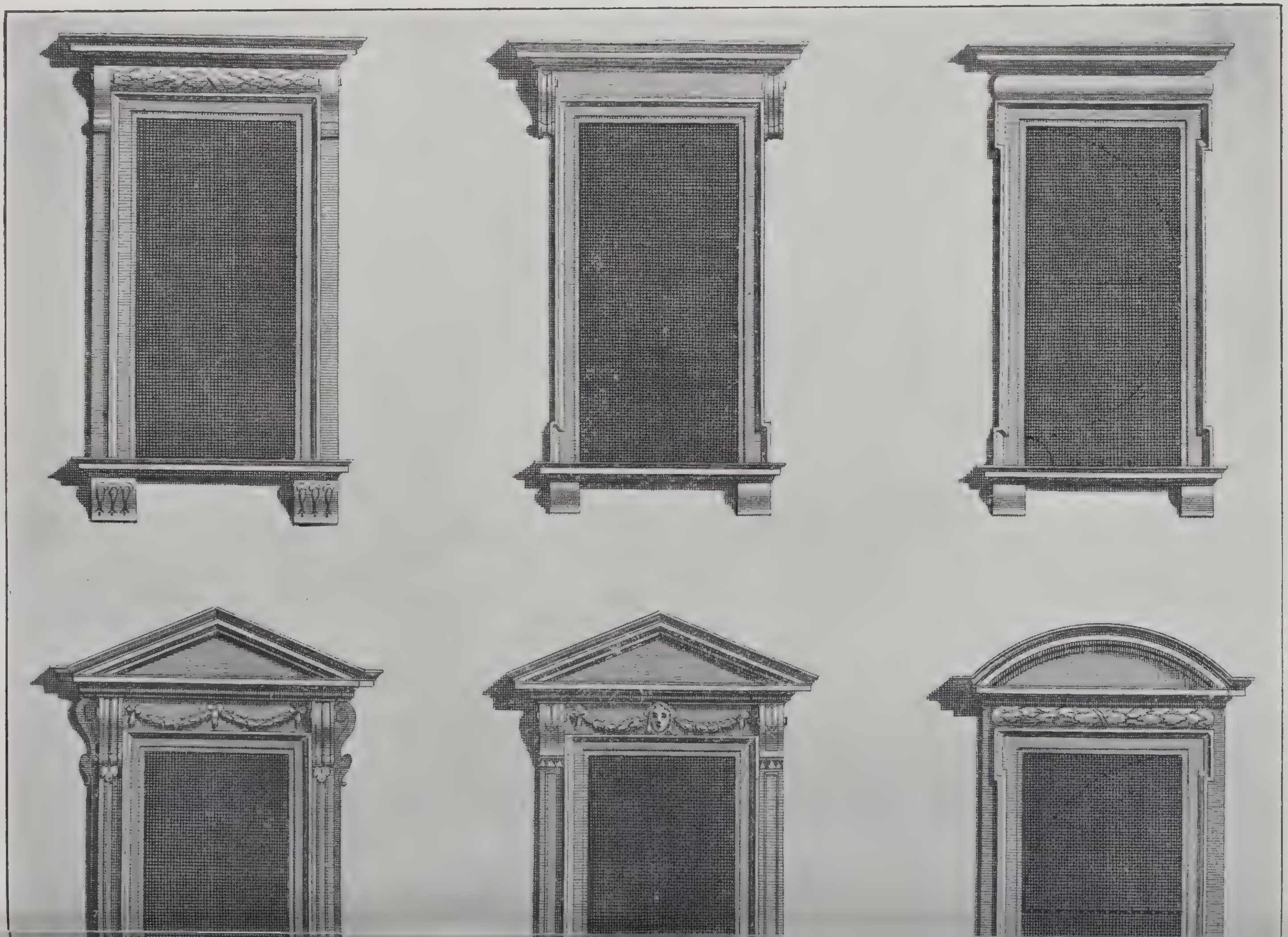
THE BOARD OF PROFESSIONAL DEFENCE.

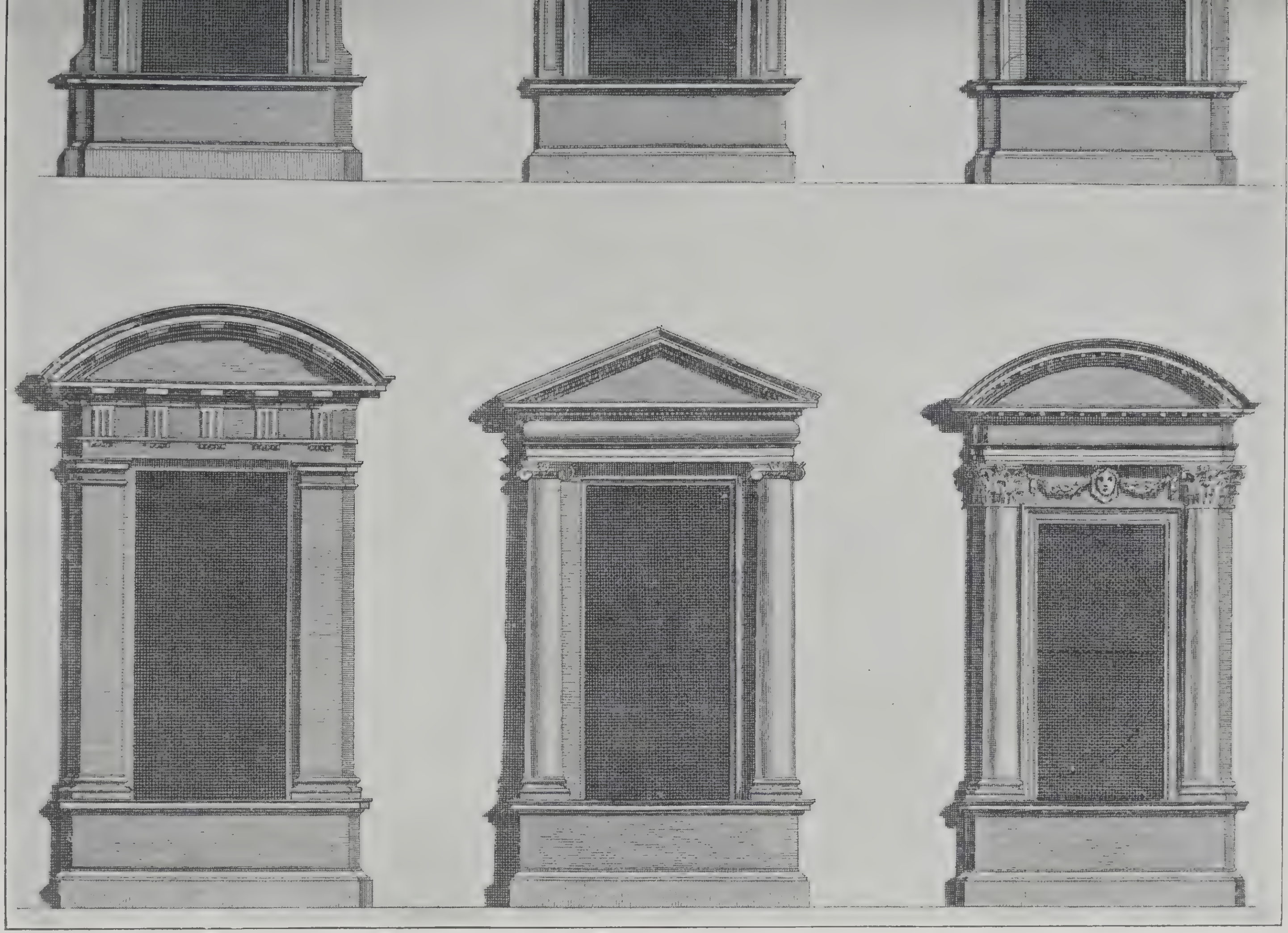
The onerous duties of the Board of Professional Defence are carried out in a manner so passing strange and unostentatious that we have often felt inclined to doubt whether even the *existence* of this extremely valuable organisation of architectural "stalwarts" is known to the majority of our readers. Whilst we are not desirous of destroying, by dragging into the full glare of publicity, the tranquil environment hitherto enjoyed by the self-contained members of an unscrutable board, yet as the most passive of passive resisters often, inadvertently, commits many sins (of omission), we are bound to take such salutary measures as are in our power by calling attention to a recent case in which the long-suspected shortcomings of the Board of Professional Defence have at length, in our judgment, been made manifest. A letter we have received from an old and highly-respected member of the Royal Institute of British Architects with regard to the conduct of this Board seems to require a very full and explicit answer, and we await it with a considerable amount of interest. Briefly, the facts of the case are as follows: —Some three years ago our correspondent was asked by a client to look out for an old house, situated in one of the most fashionable parts of London, which could be altered and adapted to suit modern requirements. A considerable amount of time was expended in this preliminary search, during which the architect visited and inspected several house, and wrote numerous letters and reports respecting their suitability, but nothing further was done until about a year later, when a house was at length selected, which our correspondent was instructed to alter and embellish. The alterations themselves were of a quite unimportant nature, and merely involved the removal of some partitions, blocking up a window in one of the rooms, and substituting a domed top light. The decorations, however, were designed on an elaborate scale, and various schemes for colour and plaster treatment were prepared, and after one (of several designs made in sketch form) had been chosen for execution, the whole of the requisite full-size drawings and cartoons were completed, and great personal attention was given by the architect to the supervision of all modelled and other executed work. An enormous amount of time, quite out of proportion to the outlay (about £1,500) was thus expended, and, in addition to the work involved in connection with the design actually carried out, many schemes were made, and ultimately abandoned, for other decorative works, including alternative drawings for an elaborate staircase—(1) in bronze, (2) in wood, and (3) in iron, for which full-size details were made, and estimates obtained. For the work thus set aside, a charge of £6 6s. a day was made for the architect's time (to which was added the amount paid to his staff for assistance) and for the surveys and reports on the old properties (including interviews, letters, etc.), the charge was at the rate of £3 3s. per day. Our correspondent's client refused to pay *any* of the charges beyond those he described as "recognised" architect's fees of 5 per cent. upon the amount of the work actually executed. He further declined to admit his liability to pay anything for the time expended in preliminary inspections and negotiations with regard to the old properties, refused to pay any charge for preparing duplicate plans, for the approval and deposit with the freeholders, nor would he make any payment for the working and other drawings which were prepared by his instructions but never executed. Owing to the fact that our correspondent could obtain no support from the Board of Professional Defence, he was forced into the alternative of either having to accept the amount ultimately offered by his client in full settlement (which was less than one-third of what was justly due) or to face what would inevitably prove a long delayed law-suit, in which the costs of the action would more than absorb any sum that might be awarded to him even if it covered the full measure of his claim. Our correspondent was also advised that, owing to the ridiculous manner in which the scale of charges authorised by the R.I.B.A. has been drafted, it was very doubtful whether he could substantiate his claim for more than 5 per cent. on the amount expended (although he offered to accept 7 per cent.), and that, as the Institute would not officially support his case, there was little or no hope of ultimate success. Had it been possible to obtain evidence from the R.I.B.A. that the charges were just and fair ones, the claim could never have been repudiated, as the facts were indisputable. Finally, our correspondent found he could not do otherwise than accept the sum paid into Court by his client, which was barely sufficient to cover his out-of-pocket and working expenses. The letter concludes with the following expression of opinion, with which we heartily concur:—

"I do think something ought to be done to raise a feeling against the shocking want of *esprit de corps* at the R.I.B.A., which allows its members to suffer in this fashion without even making an effort to help."

[illegible]
OF THE
UNIVERSITY OF ILLINOIS

Supplement to THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER. ***Wednesday***, *February 3rd, 1909.*





SOME DESIGNS FOR WINDOWS. BY JAMES GIBBS.

PLANNING THE HAGUE PEACE PALACE GARDENS.

By T. H. Mawson, Hon. A.R.I.B.A., author of the first premiated design in the International Competition.

At a meeting of the Liverpool Architectural Society, Mr. T. H. Mawson, Hon. A.R.I.B.A., of Windermere, the winner of the International competition for gardens to the Hague Palace of Peace, delivered an interesting lecture on the subject.

The garden designer who has to fit in his garden with houses where there is no clearly defined style as a basis to start upon, and is anxious to secure some degree of harmony between the house and the garden is, said Mr. Mawson, constantly putting to himself the problem: What would the architect have done if he had planned the whole scheme himself? The designer of the Palace of Peace was almost wholly free from city restrictions, and was thus open to concentrate upon monumentalising a palace to express and enshrine the noble ideal of universal peace. The period chosen as *motif* by the successful architect is that which is peculiar to the fighting barons of Normandy, and is occasionally seen on the Rhine, and perhaps more frequently in Scotland, whither it was imported when she was coquetting with France. Whether the *motif* is a right one or wrong, M. Cordonnier will, in the author's opinion, succeed in erecting a more dignified presentment than we usually see around us. From the conditions given to the competitors in the garden-planning scheme, the author gathered that the trustees of the Carnegie foundation desired a scheme which would fittingly correspond with the amplitude and magnificence of the Palace, and that they looked to each competitor to unite fittingly the Palace with the natural beauty of the park on a similar bounteous and monumental scale, and at the same time bring palace and park into a proper topographical relation to the town.

As to the landscape, almost all visitors to this part of the Continent know the superb Scheveningen Avenue, which forms a boundary to the present Buiterust Palace. To those who do not know it, it will be sufficient to say that the influence and sentiment of this part of the Hague retains the atmosphere of the celebrated Dutch landscape painters. The site is at once reminiscent of Hobbema's umbrageous avenues, and Jan Steen's quaint architecture.

As to the peopling of the Palace Garden, and the uses it is to fulfil, the author concluded that although the public will not be freely admitted as into a public park, yet there will be in addition to the plenipotentiaries, in residence or attendance during the peace conference meetings, a large number of secretaries, and so forth, all of whom would have free use of the gardens. He concluded, also, that during the long vacations, permission would be given to visitors (subject to certain regulations) to view the gardens. Therefore provision has been made for walks and terraces largely in excess of what is needed in private parks and grounds.

The ethical aspect of the question to be solved demands that the prior impression upon the spectator should be that of spaciousness and restfulness. The very word peace leads the mind to something spacious and wide-spreading, and implies quiet stretches, open effects, and secluded avenues for meditation and tranquility. Therefore, in evolving his design, the author distinctively sought to realise a garden that bespeaks peace and rest—by breadth of treatment, and by noble, happy, and dignified features and adornments, avoiding a multiplicity of such, for fear of destroying breadth and scale. He has further sought to suggest, by beautiful sculpture and restrained and chaste modulation of ornament, the arts of peace, and to pronounce the restful note by clear, tranquil pools of water; and by a careful selection and disposition of trees and shrubs, ensuring scale of leafage and promoting the same harmoniousness throughout, and avoiding all prickly exotics and violent schemes of colouring or over-bold contrasts which do not conduce to this pleasure.

To realise this expression of peace and tranquility by a dignified presentment to the mind and eye, it is first necessary to form a broad-spreading basis to the palace itself. This could only be done by distinctive spreading masses of masonry and level spaces of greensward, gravel, or pavement, repeating in the terraces and other architectural features the monumental stone treatment adopted by the architects in the lower portion of their design.

From a careful study of the design for the Peace Palace, it seemed to the author that the architects have themselves put forth some slight suggestions in the directions he had followed in his designs. He had the further object in mind of carrying the atmosphere of the Peace Palace into the remotest portion of the grounds.

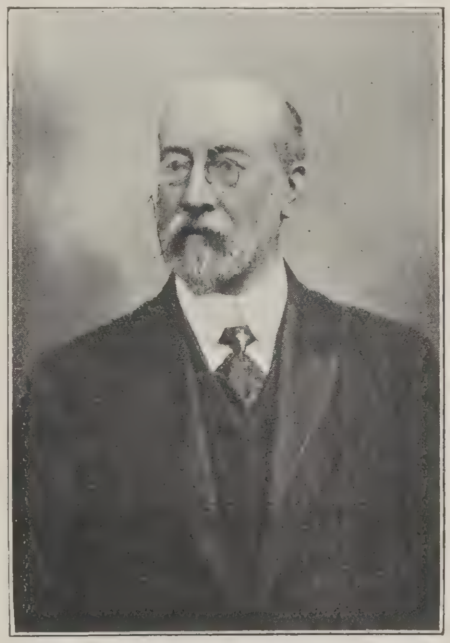


Photo: Russell.

MR. JOHN BELCHER, R.A.

Mr. Belcher, the well-known architect, attained Academician rank last week in company with Mr. Goscombe John, the sculptor.

It was of equal importance to secure a proper relationship between this most important building, and the town. The scale of the Peace Palace is such as to render in all probability a permanent dominating note in the composition of this part of the Hague. It had therefore appeared to him that the palace and park should not only be suitably received into what is without harshness or discord, but that they should contribute to the further improvement of the "city beautiful," welding into picturesque compositions the new and the old.

At the conclusion of the lecture, which was accompanied by lantern slides of the winning design, and also of the second premiated design, which was submitted by a Dutch firm, a hearty vote of thanks was accorded to Mr. Mawson

Our Plate.

The nine designs for windows by James Gibbs show considerable "diversity in unity." They are all unmistakably by the same hand, and yet there is remarkable variety in the detail. The designs are, without exception, suave, dignified, and restrained, and show complete mastery of the resources at command, and much ingenuity in adapting them to the somewhat exacting circumstances.

R.I.B.A.

CRITICISM OF WORK SUBMITTED FOR THE INSTITUTE PRIZES AND STUDENTSHIPS 1908-9.*

By Paul Waterhouse, M.A.Oxon (F.).

The Essay Medal.

The three selected for mention are happily better than the average production of recent years. This prize should undoubtedly attract a better class of writing than we generally secure; our literary level is nowhere near the standard attained among our draughtsmen. "Void's" work (Mr. H. A. Hill, B.A.) is a sensible essay, not very brilliant, perhaps, nor very clever in its conclusions, but the thread of thought is clear and the style free from blemishes. He beats his rivals by a not too wide margin. "Vita Nuova" (Mr. Horace Cubitt) has lapses of style, but his matter is in some ways more interesting than that of "Void." "New Lamps for Old" (Mr. Ross) submits a bright and readable paper, and he avoids the fault of producing a mere compilation, and his work is at least a continuous composition. "Modus operandi" and "X. Y. Z." come, in my opinion, in the second class: the former writes cleverly but too slightly; he has some original points, but rather shirks the larger issues; the latter, on the contrary, is too prolix, and, in the language of the golf-links, is "poor in his approach." It is a great thing to get on to the green and to do it neatly; also, of course, one should if possible "hole out." Of the remaining four I have no wish to make particular criticisms by name. I will merely say to one of them, "Be graceful as well as industrious"; to another, "Write a continuous essay, not a series of chapters"; to a third, "Please don't be vulgar"; and to the last, "Develop." To all I might commend one very simple truth—that the only recipe for writing is reading.

Measured Drawings.

In this competition there are two competitors who press the winner hard. Mr. Ernest Wray ("San Gallo") is the medallist, and his survey of the Church of the Madonna di San Biagio at Montepulciano is a well-drawn and complete record of an interesting bit of work. Mr. Alan Brace, who wins a second prize (as "Flint") with a study of Lavenham Church, has turned out a very beautiful piece of pencil work; his handling is nearly perfect, and I am impelled to conclude that if his delineation had been more complete he would have won the prize. The absence of a longitudinal section deprives us of any record of the nave arcade.

The Soane Medallion.

That Casino was an excellent subject for the Soane Medallion. It has set men thinking not merely of the old truth that an architectural design must express the spirit of the building it clothes, but also of the question (always an important question) how far that expression must be explicit, how far literal, and to what extent curbed. For "Conchitic" I feel sympathy and disappointment. More than any rival he has been faithful to the spirit or to a possible spirit of the subject, but he suffers for his realism. He should have tempered truth with dignity. In other words, by his very realism he falls short of architecture, and that is why he cannot have an architectural prize. His plan is fairly good, his elevations are mischievously clever, and his perspective as a composition and as a bit of quiet colouring is excellent. But—if I may put it as clearly as I can—his Casino, if conducted on the lines of his design, would deserve to be closed. Mr. Anthony Barker has caught the breeze of frivolity without relapsing either into buffoonery or vice. "Centrelines," a scheme by Mr. A. Berrington, is another design overflowing with that buoyancy which characterises the products of a good Soane year. Probably it was time rather than any lack of impetus which cut short the completion of the perspective. What there is of it shows a happy knack of draughtsmanship, and the power to infuse a drawing with the spirit of the designer. It is full of an irresistible gaiety. The elevations and sections are cleverly drawn in a rather unusual style. The plan is fair, but there seems to be no provision for a stage in the concert room.

---

*Extracts from a paper read at the general meeting of the Royal Institute of British Architects, February 1st, 1909.

The Owen Jones Studentship.

Unhappily this important prize has to be withheld. But Mr. Maw, the sole competitor, who is awarded twenty guineas, has sent in some interesting work. His subjects are the Corsini chapel in San Giovanni in Laterano, and the ceiling of the Scale d'Oro at Venice. The studies of the latter are laborious and effective. The amount of work put in the pictorial panels and their rich marginal frames is astonishing. I take off my hat to his industry.

The Pugin Studentship.

There is a full competition for this interesting prize, and a very high level is reached. The winner, Mr. S. H. Miller, has mastered the enviable trick of drawing a perspective sketch in such a way as to give real information in detail. He is happy both with ink and pencil, and in a study of some Fairford glass shows that he can hold his own with colour, too. Mr. Fraser has done good work at Southwold, and, like the winner, shows himself to be capable in more than one medium. Mr. Gill is to be commended, not merely for excellent draughtsmanship, but for some really good printing and writing, especially on his Chichester sheets.

The Tite Prize.

The Tite Prize competition is generally more sober than that for the Soane; the great names quoted in the conditions as exemplars perhaps account for this result.

A few words about the three winning designs by Messrs. Gunn, Maw, and Lisle. They are all three excellent workmen, and have turned out quite first-class work. Mr. Gunn's perspective is a marvellously delicate piece of pencil work; it is, in fact, too delicate for effect. Mr. Maw ("Dezzezero") submits a set which for pure beauty of execution runs the winner very close. His delineation of statuary and of colour decoration is most beautiful. Perhaps his general scheme errs on the side of sacrificing too much to effect. Mr. Lisle will not quarrel with me if I describe his work as peaceful. It is one of the best attributes one can apply to architecture, and he has succeeded in keeping out of his design and its execution anything that could possibly ruffle its calm.

The Arthur Cates Prize.

Mr. Leslie Wilkinson, to whom the distinction goes this year, is well deserving of the honour. His interesting studies range from St. James', Piccadilly, to St. Mark's at Venice, and include two excellent Oxford drawings—one a difficult sketch of the Radcliffe Library, and another of Inigo Jones' Court at St. John's College.

The Grissell Prize.

"Dies" (Mr. Douglas William Day), to whom the prize has been awarded, has very properly had an eye to royal effect as well as to structural stability. He has in his roof adopted the double-dome construction, and has worked out the stresses and weights with commendable care. Every portion of the jointing of the masonry is most clearly shown, and he has been at pains to make a real study of the problem. His design is simple and pleasing—none the less pleasing for being simple. A building of this kind is meant to give its effect at some distance across the water, and the designer has evidently borne this in mind. But I am not sure about his wilderness of colonnades. He has filled the sheet with them.

It was announced at the meeting of the Royal Institute of British Architects on Monday night, that Dr. Arthur J. Evans had been nominated to receive the Royal Gold Medal.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Feb. 20	GUILDFORD. Footbridge over the River Wey. Designs are invited for a light footbridge in oak or other materials. Particulars from C. G. Mason, C.E., Tuns Gate, Guildford. Designs to be sent to W. Shawcross, Hon. Sec., 108, High Street, Guildford.
Feb. 20.	PENCLAWDD (WALES). Chapel. Plans are invited for a new chapel to contain 800 seatings. Approximate cost of chapel, including heating and acetylene lighting apparatus, £3,000. Premium—five guineas to the architect whose plan *the Committee may select.* Plans to be deposited with John Rees, Secretary, Penian, Penclawdd, S.O.
Mar. 1.	TORRINGTON (DEVON) Memorial Cross. The Committee of the Rolle Memorial invite designs for a memorial cross (preferably of granite), to be erected in the churchyard, Torrington. Cost, inclusive of erection. &c., not to exceed £100. Premium £2 2s. for the selected design, but no other charge or expense. Particulars from George M. Doe, Town Clerk, to whom designs are to be sent.
Mar. 17	NEW OFFICES FOR THE STANLEY U.D.C., DURHAM. Cost £3.500. Premiums £30, £20 and £10. Conditions, etc., to be obtained from J. G. Ridley, Clerk to the Council. Stanley S.O., Co. Durham.
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days.
No date.	PONTARDAWE (WALES). Offices for the Guardians, in Holly Street. Premium £10 10s. The premium is offered by the Guardians "for plans with abridged specification, *which in their judgment* are best suited." Particulars and conditions from C. B. Jenkins, Clerk, Herbert Chambers, Pontardawe, S.O., Glamorganshire.
No date.	BLACKBURN. The Blackburn Small Holdings and Allotments Committee have decided to invite architects and surveyors in the Borough to submit competitive plans for the laying-out of the estate at Oswaldtwistle, recently purchased for small holdings. Premiums of £25, £10, and £5 are offered.

The Cornwall County Offices, Truro.

Fifty-nine sets of designs have been submitted for the above buildings, of which nine, selected by the Building Committee, have been submitted for the adjudication of the assessor, Mr. G. H. Fellowes Prynne, F.R.I.B.A. Considerable indignation has been expressed at the withholding of the fifty other designs from the assessor's inspection, and this is decidedly a matter on which the R.I.B.A. Competitions Committee should take action. It is said that the committee rejected those designs which would obviously cost more than they were prepared to spend; but it is said no limit as to cost was embodied in the conditions.

The Bristol Royal Infirmary.

The assessor, Mr. Edwin T. Hall, vice-president R.I.B.A., has made his award in this competition with the following result:—1st premium, Mr. H. Percy Adams, London; 2nd premium, Messrs. Henman and Cooper, Birmingham; 3rd premium, Messrs. Worthington and Son, Manchester.

Municipal Buildings, Coventry.

At a meeting of the City Council on the 26th ult., the General Works Committee's scheme for new municipal buildings was rejected on an amendment of Dr. Iliffe, which also provided for instructions to be given to procure competitive plans. Presumably, therefore, the institution of a competition may be expected in the immediate future.

Offices for the Stanley U.D. Council, Durham.

We have been asked by Messrs. Speir and Beavan, of Cardiff, to give publicity to the following correspondence, which may be of interest to those who think of entering for this competition:—

Mr. Joseph Routledge,
Surveyor,
Council Offices, Stanley,
Co. Durham,
January 26th, 1909.

New Council Offices.

Dear Sir,—We have duly received a copy of the conditions herein, but wish to draw your attention to the following points:—

(1). No mention of professional assessor. Is one to be appointed, and if so, what guarantee have competitors of his standing? Would he be appointed by the President of the R.I.B.A.?

(2). *Clause* 7.—Some allowance should be made for travelling expenses.

(3). *Clause* 29 is manifestly unfair, and places competitors at a great disadvantage. If these points are amended we shall be glad to compete.

Yours faithfully,
SPEIR and BEAVAN.

[COPY OF REPLY.]

Messrs. Speir and Beavan,
Architects, etc.
January 28th, 1909.

Re Council Offices.

Gentlemen,—Your letter of the 26th to hand.

(1). The Council will be the assessors.

(2). No allowance will be made for travelling expenses.

(3). If you compete you will have to abide by the conditions.

Yours faithfully,
JOS. ROUTLEDGE.

Borough Chambers,
Wharton Street, Cardiff.

REASON IN BUILDING; OR, THE COMMONSENSE USE OF MATERIALS.

Mr. Schultz, at the commencement of his third and concluding lecture at the Carpenters' Hall, on Wednesday evening last, said that he proposed, on that occasion, to touch on the other crafts connected with building, and to endeavour, in the short time at his disposal, to draw attention to the importance of critical observation, and the consideration of all points relating to the economical use of materials. Also, that while it was essential in a design, whether large or small, to get the idea right, yet, it was also important to pay attention to detail, for the success of the work depended as much upon the one as on the other.

He then proceeded to take up the subject where he left off at the preceding lecture. Dealing with the brickwork, he said, get to know, in the first place, the qualities which go to make up a good, sound, reliable building brick. Visit, not one, but many brickfields, for the bricks vary considerably in texture, quality, etc., according to the earth used. For example, we have the old-fashioned London stock. Then there are the hand-made, sand-faced red bricks of the Home Counties; Fletton machine-made bricks from Peterborough, much used in London now; white and red bricks from Suffolk; Bridgewater bricks from the west, and a host of other machine-made, pressed, and wire-cuts, from other parts of the country. The bulk of bricks, he said, are now made by machinery, on account of economy in the cost of production, which in these days of keen competition has to be considered before quality and durability. He next drew attention to the importance of colour, mentioning that the nature of the brick-earth affects this considerably. He drew attention also to the effect that can be obtained by choosing bricks carefully and using varying colours, contrasting the variety of colour in an old brick wall, with the hard even colour of a modern wall. A number of architects, he said, now use second-quality bricks, instead of the "best selected" bricks, as the modern specification usually runs. Forms that involve much cutting in brickwork, he said, should be avoided. Curved forms should be used sparingly, and as to moulded brickwork, this should be built up of simple forms, such as the bull-nose and cavetto, which were commonly used in old work of this kind, and look beautiful. Good effects can also be obtained by slightly projecting a course, or by a row of dentils formed by headers, or bricks placed angle-wise and projecting, etc. He emphasised the importance of bond, particularly in relation to window openings, sizes of piers, etc. Passing on to pointing, he said that the "struck weather joint" so often specified was in practice useless from the point of view of throwing off the water, and recommended a flush mortar joint as being the best. As to the sizes of bricks, four courses to the foot, including mortar joints, was the usual size, and this is especially convenient for designing on paper. He then briefly enumerated several kinds of bricks used in England, such as Dutch bricks and Roman bricks. Brickwork, he said, must be considered differently where it was used alone from when used with some other material such as stone. He referred to St. Luke's Hospital, City Road, as an example of good building, big in scale yet simple and dignified. The new buildings by the side, he said, he did not admire as examples of brick treatment.

Passing on to tilers' work, he pointed out that much discrimination was necessary in selecting roofing tiles. The old hand-made sand-faced tiles, when well made, were lasting enough, but when made badly, were apt to absorb moisture and crack. Consequently, a harder tile with an impervious surface was demanded, and was supplied in the shape of the Broseley tile, which has a slightly vitrified surface. He deprecated the use of the decorative ridge tiles which are so often seen, and for this purpose recommended half-round tiles bedded in cement, as being the simplest and best. Having alluded briefly to the various uses for tilework, such as copings, arches, etc., and also to simple forms of fireplaces, constructed with bricks, tiles, and fire brick, he proceeded to deal with woodwork:—(1) He said, consider the nature of the wood in relation to the design. (2) Don't imitate mouldings and carving suitable to stone or other framing on the outside of houses; this, he said, was encouraged by the pretty-pretty architect, and there was now a passion for what is called half-timber work, which amounted to a craze, and should be discouraged. Wood, he said, formed a delightful lining to a room, and, where panelling could not be afforded, ¾in. boarding rebated and nailed to studding with copper nails in patterns. He then reviewed plumbers' work, and particularly ornamental leadwork, drawing attention to the durability of the material which made it especially suitable for rain-water heads, etc., where iron would need painting. When speaking of plaster, some fine examples of plaster ceilings were shown on the screen, including ceilings from Audley End, and the New River Co.'s Offices. He next described four buildings which have been designed by architects who have endeavoured, in carrying out the work, to get more in touch with the craftsmen employed:—(1) He referred to a church near Reigate designed by Mr. Barnsley, who himself lived on the spot, and personally superintended the work. (2) Kempley Church, Gloucestershire, completed under the personal supervision of Mr. Randall Wells. (3) Kelling Place, Holt, Norfolk, designed by Mr. E. S. Prior and carried out under Mr. Randall Wells, who bought the material and selected the workmen. (4) Roker Church, Sunderland, also designed by Mr. E. S. Prior in conjunction with Mr. Wells; the latter resided on the job and personally directed it.

In conclusion, Mr. Schultz said that if any lasting good is to come, in the shape of commonsense building, the improvement must be gradual, the craftsman must be trained in a sensible manner, and the client must be taught to see that good work is worth more than tawdry pretentiousness.

He also wished the Carpenters' Company every success in the scheme which they had initiated to better the existing deplorable state of things.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

The querist's name and address must always be given, not necessarily for publication.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s., made payable to Technical Journals Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

Such answers will be forwarded to the querists promptly on receipt from the respective experts, but the Editor will not be responsible for any delay that may arise. The fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies. Every effort is made to ensure correctness, but Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

The Editor expressly declines to be held responsible for any mistakes or inaccuracies that may occur, nor does he undertake to satisfy in every instance the querist's demand. The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule be published in these columns.

Smoky Chimney.

In the reply to "L.L.J. (Carnarvon)," in last week's issue, the "Edwardian pot" was mentioned as having proved very efficacious in the treatment of down draughts. The name of the proprietors of the "Edwardian pot" should have been given as Messrs. Mark Fawcett and Company, of Westminster.

Sliding Doors.

SKIPTON.—S. D. writes:—"I enclose herewith a small sketch, showing the construction, according to my design, for sliding doors. Please state, through your paper, whether the construction of this door is correct. I should also like your opinion on the method suggested for fixing the running rail, and shall take an interest in any suggestions you think necessary." [Sketch not reproduced.]

The construction shown would be satisfactory. It is presumed that the central muntin would be continuous and the full thickness of the 2¼in. framing, while the bottom and middle rails and all braces would be barefaced tenoned in, behind the matched filling-in. The method suggested for fixing the running rail over the opening is a suitable one; the continuation at side of opening should be pinned in cement into a joint of the brickwork. It is usual to have in addition a grooved guide, or guide rollers on bottom edge of door, working over (but not bearing on) a T iron rail, as otherwise the secure fastening of the door is a matter of difficulty, since it may be swung away from the wall. There is always the risk that this type of door may become accidentally dismounted from the rollers. A safer means of hanging is by one of the patent forms of ball-bearing hangers, such as the "Coburn," in which the track encloses the rollers, and prevents jumping, as well as affording protection against the presence of obstructions tending to accidentally jamb the runners.

G.

Liability for Defective Drainage.

HULL.—R. R. G. writes:—"I should be much obliged if you can inform me of a parallel case to the following; whether it has been tried in court, and if any damage has been awarded the tenant from the landlord. A house is let to a tenant, and is stated to be in perfect order, particularly with regard to the drains. After the tenant occupies the house the drains are found to be defective. Illness results, and the tenant has to leave the house. It was known by the landlord that previous tenants had to leave through illness caused by defective drains aforesaid."

In answering this question, I must assume that the tenancy refers to an unfurnished house, and not to a house which comes under the designation of "for the working class." The landlord is under no obligation whatever unless (1) he covenanted to put the drains in order on entry, or (2) he gave an undertaking which amounted to a warranty that the drains were in good order at the time he let the house. Woodfall clearly expresses the law thus:—"A landlord may, of course, take upon himself to do all or any of the repairs during the term, by an express covenant or promise to that effect in the lease or agreement; but in the absence of any such stipulation he is not liable to do any repairs whatever. Whatever he agrees to do in this respect should be inserted in the lease or agreement; the tenant should not rely upon any oral promise made before the lease or agreement is executed. There is no implied duty in the owner of an unfurnished house which is in a ruinous and unsafe condition to inform a proposed tenant that it is unfit for habitation; and no action will lie against him for an omission to do so, in the absence of express warranty or active deceit."

F.S.I.

Compensation for Compulsory Acquisition.

TWICKENHAM.—T.H.S. writes: "A borough council are compulsorily acquiring properties under the provisions of the Housing of the Working Classes Act, for the purpose of improving a certain portion of the district. Certain of the properties to be acquired are copyhold, and, as such, under the customs of the manor are subject to an arbitrary fine or admission, a small annual quit rent, and a heriot at death. The valuer for the copyholders fails to agree to the compensation offered by the corporation. Please give your opinion on the following points:—(a) The compensation claim consists of the amount paid for property at a recent public auction, plus law expenses, plus admission fine. The surveyor to the corporation refuses to offer more than the sum paid at the auction sale. If this sum is accepted, the claimant has a considerable direct loss, as under (figures not actual):—

Price paid at auction ...	£100
Law expenses, etc.	10
Admission fine	50
Total ...	£160

Amount offered by corporation £100. Under these terms the claimant is £60 to the bad. If the corporation acquire this property, his name will be removed from the Manor Roll, and consequently a fresh admission fine will have to be paid should he purchase another copyhold afterwards. (b) If, however, he purchased another copyhold property before the corporation purchases his present holding, he will be admitted on the second property at a nominal fine. This will prevent his losing the whole of the original admission fine; but as he will not be able so easily to secure a small copyhold, he will be compelled to purchase larger premises, thus expending money in excess of his desires, and at some inconvenience to himself. I offer, as an alternative valuation:—Purchase price of property No. 1 £100 plus law expenses, and nominal admission fine incurred in purchase of second property. Is my contention right in either case? Rental is not much guide as to value, as these small copyholds have an enhanced value from the fact that they are frequently sought after by proposed purchasers of larger property in order to reduce the amount of the admission fine, which, though arbitrary, has generally some relation to the value of the property."

The Housing of the Working Classes Act, 1890, empowers the local sanitary authority to close houses which are unfit for habitation, and, if necessary, to demolish them. It gives power to any person who is aggrieved to appeal to Quarter Sessions (Section 35). Further, the Act empowers the sanitary authority to pull down and remove any obstructive building, and under certain circumstances to purchase the property in question (Section 38), but these powers are of a very carefully guarded kind, and I advise you to study the Act before taking any decided step in the matter. To answer your questions as you put them:—(a) I think that in any case admission will have to be paid whenever your client purchases additional property in the manor. Personally I know of no manor in which the admission in respect of the copyhold tenement frees a tenant from the necessity for admission in respect of another tenement, subsequently acquired. (b) The amount which the sanitary authority should pay is the sum which the property is now worth, and, taking all the circumstances into consideration, of course they must also pay the customary ten per cent. for "compulsory taking." It is, naturally, quite competent for you, in support of your claim, to advance arguments as to the original cost of the property (and in this connection I quite agree with your contention that the legal expenses and the payments to the lord of the manor should be included, because they were necessarily parts of the purchase money), but the original cost has no real bearing upon the present value of the premises. I do not follow your final argument about the enhanced value of small copyholds generally, but it is possible that the exceptional custom of which you speak may exist in the particular manor with which you are dealing. The steward would at once tell you.

The Housing of the Working Classes Act, 1890, incorporates many of the provisions of the Lands Clauses Acts, and the procedure must be in accordance therewith.

After a notice to treat has been served, the owner must send in a formal claim; if the amount claimed be over £50 the owner may elect whether, in case the claim is not paid, he shall go to a jury or have the amount settled by arbitration.

No unnecessary delay must take place in any case, but should he go to a jury, they must be summoned within twenty-one days, and will, of course, give an immediate verdict.

The purchase must be completed within one year of the first making of the order by the local authority (Section 38, 4). I advise you to get a copy of the Act. The cost is merely a few pence.
F.S.I.

Models for Honours, Carpentry and Joinery.

We have received a letter for "Sydney," Stockport, whose enquiry we answered last week. Our expert not having preserved the original letter, we are without "Sydney's" name and address, but if he will send these on we will forward the letter to him.

Copper for Roofing.

Birmingham.—X.Y. writes:—"I think of covering a dome with copper. Can you tell me whether there is any distinct advantage in this material proportionate to its extra cost as compared with lead? Also do you know of any means whereby it can be made to go green (as on Continental domes), instead of the smoky black usual in manufacturing towns?"

In certain cases copper possesses several manifest advantages as compared with lead as a roofing material. Being both harder and tougher than lead, and less subject to the expansion and contraction caused by changes of temperature, it is not liable to "crawl" in the way in which lead roofing does when laid on a steep pitch. If well executed at first, copper roofing is practically indestructible by weather, and needs no repair; it is also both lighter than lead and more fireproof; though these latter advantages are probably not of great importance in the case mentioned. The green colour (not peculiar to Continental domes; e.g., Hampstead Parish Church spire) is due to a film of basic ecetate of copper (verdegris), formed by exposure to the atmosphere. When undisturbed, this film prevents further decay. It may be simply produced by chemical means (see "Builders' Journal," Vol. xvii., No. 430), but is not permanent in the atmosphere of a manufacturing town. As to the relative cost of lead and copper roofing, in the present state of the market, 12ozs. copper should be comparable in cost with 6lb. lead, so that the "extra cost" should be practically negligible.
G.

Strength of Compound Girder.

Birkdale.—Calculator writes: "How is it possible to calculate a compound girder formed of two R.S.J.'s and one plate above connecting the two, this plate to take a portion of the stress?"

The strength of a compound girder built up of two R.S.J.'s and one plate above can be found in the following manner:

Let A = area of each joist in sq. in.
,, a = area of the plate in sq. in.
,, I_J = moment of inertia in inch units of each joist about the line XX.
,, i = moment of inertia in inch units of plate about line YY.
,, I = moment of inertia in inch units of whole section about line CC.
,, z = section modulus in inch units of each joist.
,, Z = section modulus in inch units of whole section.
,, d = distance in inches from centroid of section to centre of plate.
,, x = distance in inches from centre of joists to centre of plate.
,, y = distance in inches from centroid of section to extreme edge.

The quantities A, I_J and z above are taken from the tables of properties of standard sections given in Section Books.

The quantity $i = \frac{bt^3}{12}$ is generally negligible.

Then we have:—$d = \frac{a\,x}{2A}$ .. .. (1)

$I = 2I_J + 2Ad^2 + i + a\,(x\text{-}d)^2$ .. (2)

$Z = \frac{I}{y}$ .. .. (3)

Then if f is the safe stress, the safe B.M. will be equal to f Z.

Taking f as 7 tons per sq. inch, and the span L inches, if the load W is evenly distributed we have $\text{B.M.} = \frac{\text{W.L.}}{8} = 7\,Z$

$$\therefore W = \frac{56\,Z}{L} \text{ tons,}$$

or if w is the safe load for the given span and kind of loading for *each* joist, the safe load W on the compound girder is $= \frac{w \times Z.}{\,}$

The following numerical example should make this quite clear: Take the case of two 10 in. × 6 in. joists with a 14 in. × $\frac{5}{8}$ in. plate above them.

From the tables we see that:
$A = 12.35,\ I_j = 211.5,\ z = 42.3.$
Also $a = 8.75,\ x = 5.312.$

$$\therefore d = \frac{8.75 \times 5.312}{2 \times 12.35} = 1.88 \text{ in.}$$

$$\begin{aligned} I = 2I_j \quad .. \quad .. \quad .. &= 423 \\ 2Ad^2 = 24.7 \times 1.88^2 &= 87.4 \\ i = \frac{14 \times (\frac{5}{8})^3}{12} \quad .. &= \cdot 3 \\ a\,(x\text{-}d)^2 = 8.75 \times (3.53)^2 &= 109 \\ \hline &\ \ 619.7 \end{aligned}$$

$y = 5 + 1.88 = 6.88$ in.

$$\therefore Z = \frac{619{\cdot}7}{6.88} = 90 \text{ in. units nearly.}$$

$\therefore$ If w is the safe load for the given span for each joist,

$$\frac{W = w \times 90}{42.3} = 2{\cdot}13w.$$

It will be noted that this is only about 6% more than for the two joists without the lapet.
A.

THE STABILITY OF WALLS.*

By Henry Adams, M.Inst.C.E. etc., Member of Council, The Society of Architects.

(*Continued from page 83, No. 729.*)

Stresses on Given Wall.

Now suppose we wish to determine the safe height for a 9in. wall in stock bricks and grey lime mortar, the formula and table show that the probable wind pressure will vary with the height and length, but in the case of a boundary wall it would manifestly be unsafe to take the whole length in estimating the wind pressure, as it is possible for a portion of it to blow down and leave the remainder standing. If there were buttresses we should limit the width taken into consideration as equal to the distance from centre to centre of the buttresses, or say 1½ times the height, and this is a reasonable length to take into account if there are no buttresses.†

Assume 6 ft. height above ground as in Fig. 11, = 3 ft. as the height to centre of gravity, and 9 ft. as the length, and by formula (6) $\log p = 1{\cdot}125 + 0{\cdot}32 \log 3 - 0{\cdot}12 \log 9 = 1{\cdot}125 + 0{\cdot}1526788 - 0{\cdot}1145091 = 1{\cdot}1631697$, whence $p = 14{\cdot}563$ lbs. per sq. ft. Then by formula (13) the stress on the two edges will be $S = \frac{W}{A} \pm \frac{M}{Z}$, or by formula (14) which is more convenient for this case, $S = wh + \frac{3ph^2}{t^2} = 112 \times 6 \pm \frac{3 \times 14{\cdot}563 \times 6^2}{{\cdot}75^2} = \begin{matrix}+3468\\-2124\end{matrix}$ or 1·55 tons per sq. ft. on the compression edge and .95 tons per sq. ft. on the tension edge, from which it is clear that we could not safely have made it any higher, or the wall would have been liable to fail by tension on the windward side. In small walls like this there is a contingency which it is practically impossible to provide against, and that is overturning by frost, although good mortar will minimise the risk. About the year 1880 the author was concerned with a case where an average length of 20ft of four 9in. brick party-fence walls 5ft. high, dividing adjacent properties, was overturned in the same night apparently from this cause. The walls ran east and west, and a rain driving from the north was followed by a sudden sharp frost. There was at the same time some wind, but not nearly enough to cause any risk to the walls without the frost, and they all fell southwards.

Relative Height and Thickness.

It would be an advantage if the thickness requisite for a wall of a given height could be directly determined, but it could not be done from the above data. The following table may, however, assist in designing plain boundary walls upon the basis of formulæ (7) and (16):—

Safe Thickness of Plain Boundary Walls.

Height of wall in feet.	Wind pressure allowed for in lbs. per sq. ft.	Thickness required in feet.		
		For compression.	For tension.	say
5	14.04	.41	.61	1 b.
6	14.56	.5	.73	1 b.
7½	15.22	.66	.91	1½b.
10	16.13	.93	1.20	2 b.
12	16.87	1.16	1.42	2 b.
15	17.09	1.51	1.71	2½b.
18	18.13	1.03	2.03	3 b.
20	18.52	2.23	2.23	3 b.
25	19.82	3.0	2.67	4 b.
30	20.09	4.0	3.10	5½b.

---

*Substance of a paper read by Prof. Henry Adams, M.Inst.C.E., etc., before the Society of Architects, on January 14th.

†The author of "Notes on Building Construction" (Vol. IV. p. 227) calls a long enclosure wall one whose unsupported length is more than about ten times its height. He says that shorter walls than these receive considerable support from each end. This, however, seems to the writer too great a length to take into account in estimating the stability against wind pressure—owing to the fact that enclosure walls are more liable to "scamping" work than ordinary walls, and the mortar is more liable to deterioration from frost and damp. Perhaps a suitable rule for length to be taken into account would be say 15 to 20 times the thickness.

The figures are plotted to curves on diagram Fig. 12, and it is interesting to note that below 20ft. high the wall would be likely to fail by tension and above 20ft. by compression, as the curves cross each other at that limit. Curves for the other formulæ are also shown upon the same diagram.

In deciding upon the thickness of a wall it should be remembered that the compression may be increased with less risk than the tension.

Hurst's Formula.

Hurst's "Architectural Surveyors' Handbook" (13th edition, p.121) gives a formula for the stability of enclosure walls as follows:—

f = the adhesive force per foot super attained by the mortar at the end of say 6 months, for brickwork in cement mortar 1 cement to 1 sand = 6,000 lbs, 1 to 2 = 5,000, 1 to 3 = 4,000; for brickwork in grey lime mortar 1 to 2 = 3,600; for brickwork in ordinary lime mortar 1 to 2 = 3,000.

H = height in feet above ground.

P = pressure of wind in lbs. per foot super, say 40.

T = thickness in ft. of a wall with vertical faces and without buttresses.

W = weight of wall in lbs. per cubic foot, = 112 for brickwork, 145 for Portland and similar stones, 166 for granite.

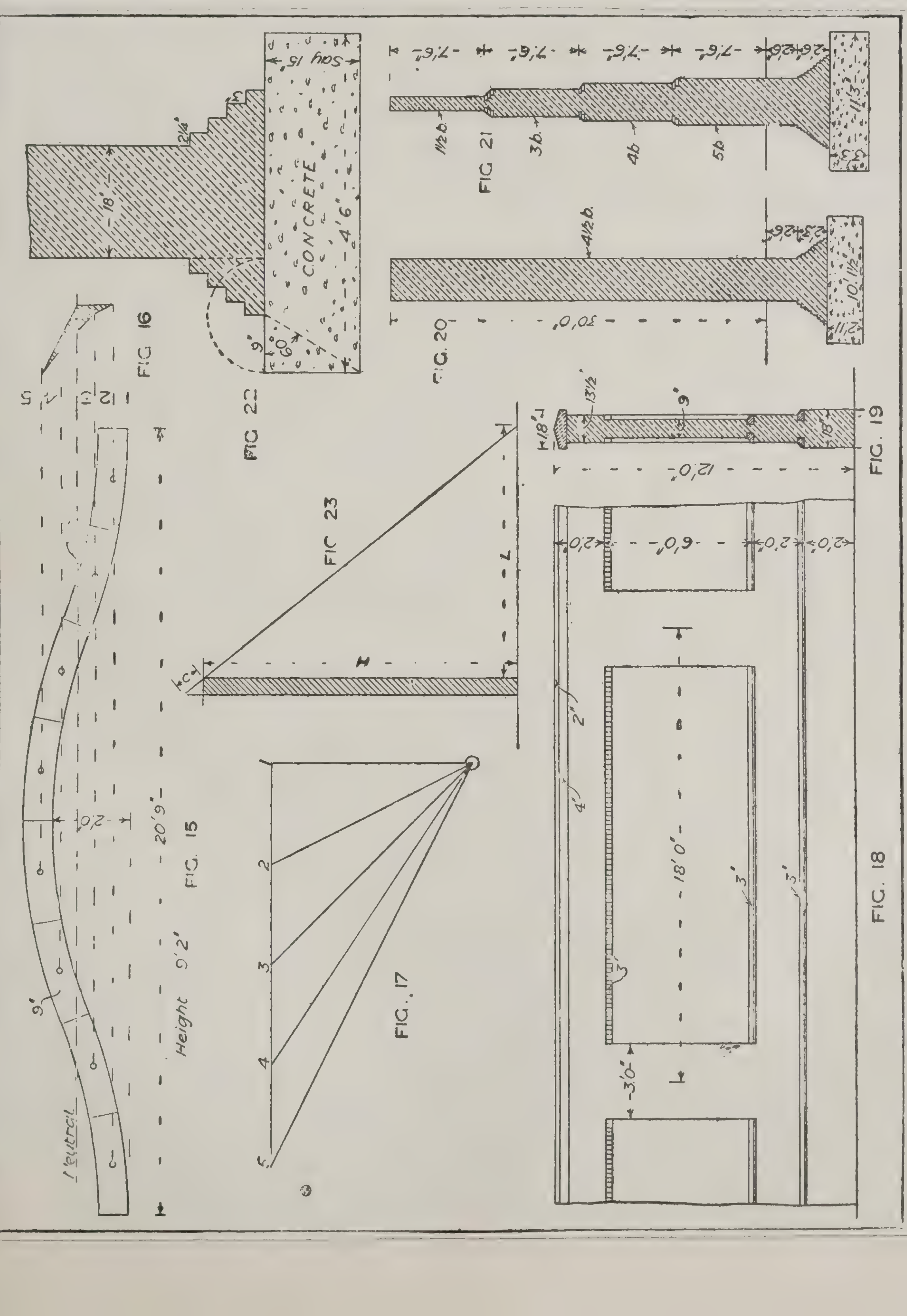
The formula is given as $T=\sqrt{\frac{PH^2}{\frac{1}{3}f+HW}}$ but there is a very serious omission in it which leads to totally incorrect results. It looks as if the $\frac{1}{3}f$ stands for safe load $\frac{1}{3}$ of ultimate tensile strength of mortar, but this is not so. There should be brackets inserted as follows:—

$$T=\sqrt{\frac{PH^2}{\frac{1}{3}(f+HW)}} \quad \ldots\ldots\ldots\ldots (20)$$

which is identical in form with (18). The different values for some of the items in this formula will, however, give the thickness required for various heights as in the following table, the wind pressure being constant at 40lbs. per sq. ft.

Height of wall in feet.	Thickness required in feet.	Practical thickness.
5	.91	1½ b.
6	1.08	1½ b.
7½	1.33	2 b.
10	1.73	2½ b.
12	1.99	3 b.
15	2.40	3½ b.
18	2.77	4 b.
20	3.01	4½ b.
25	3.60	5 b.
30	4.12	5½ b.

The required thicknesses in this table have been added as a dotted curve on Fig. 12 for comparison with the author's own values, which he believes to be safe.



PAPER ON STABILITY OF WALLS. PLATE 2

A straight line formula has also been given for the thickness of fence walls, viz.:—

$$h-6\tfrac{2}{3}\,t \quad \ldots\ldots\ldots\ldots \quad (21)$$

$$\text{whence } t=\frac{3h}{20}- \quad \ldots\ldots\ldots\ldots \quad (22)$$

This would give proportions as shown by line A on Fig. 12.

For a practically safe and simple rule the author would suggest that the minimum thickness of any fence wall should be 1-9 of the height which is shown by line B on Fig 12.

Practical thickness.		Maximum height.
1 b.	...	6 9
1½ b.	...	10 1½
2 b.	...	13 6
2½ b.	...	16 10½
3 b.	...	20 3
4 b.	...	27 0

Walls with Piers.

A boundary wall may be strengthened by the simple addition of projecting piers or pilasters built at intervals of say 1½ to 2½ times the height or 15 to 20 times the thickness on one or both sides of the wall: either opposite each other or "breaking joint" with each other at equal intervals. Technically a pier on the side next the wind is a counterfort, and a pier on the opposite side is a buttress.

(To be concluded.)

Proposed New Works.

GLASGOW, BRIDGETON.—A new R.C. church is to be erected in Old Dalmarnoch Road at a cost of about £10,800.

CHESTER.—Messrs. Milton Bode and Co. have acquired a large site on City Road, Chester, for the erection of a new music-hall.

CREWE.—A new police station is to be erected in Ford Lane, at an approximate estimate of £2,000. The county architect has been instructed to prepare plans for same.

HALESOWEN. — The Worcestershire County Council are about to erect a small-pox hospital to serve the Stourbridge and Halesowen Hospital district. Mr. H. E. Folkes is the architect. A L.G. Board enquiry has been held.

LEICESTER.—The Town Council are considering the erection of baths for Aylestone and Knighton at a cost of £6,000.

LONDON. W.C.—Holy Trinity Church, Kingsway, which, as we previously reported, has been undermined and rendered unsafe by the tunnelling operations of the L.C.C. and the tube railways, is to be rebuilt at a cost of £8,000, of which £4,000 is in hand.

MANCHESTER: CRUMPSALL. — The Free Library Committee of the Manchester Corporation contemplate the erection of a library at Crumpsall at an estimated cost of £8,000.

NORTHAMPTON.—Plans for a new hippodrome to be erected in Abington Street have been submitted to the Town Council.

ORSETT, ESSEX.—A L.G. Board enquiry has been held with reference to the proposed extension of the workhouse at a cost of £8,800. Mr. C. M. Shiner is the architect.

PLYMOUTH, MILLBAY.—It is proposed to carry out a scheme of improvements in connection with the barracks here, and an application by the Plymouth Town Council for a loan of £2,000 for street works in connection therewith will shortly be made.

SUTTON-IN-ASHFIELD.—It is proposed to buy an acre of land on the Huthwaite Road for the purpose of erecting a new school. The sanction of the Notts County Council to this purchase is now awaited.

SWANSEA.—Plans and estimate for a new drill hall to cost £19,050, have been accepted by the Glamorgan County Territorial Association.

WEYBRIDGE.—In connection with the motor track at Brooklands, a scheme is contemplated for the formation of a test hill for motor cars. The surface of the test track would probably be covered with concrete, 6ins. in thickness.

Proposed London Buildings.

LONDON.—The Building Act Committees of the London County Council, in the agenda presented at the Council meeting held recently, recommend that consent be given to the following works:—

Erection of a church on the northern side of Culmstock Road, Clapham Common, to abut also upon the eastern side of Alfriston Road, on the application of Messrs. J. S. Quilter and Son, on behalf of Canon J. E. Clarke.

Erection of one-storey shops on the north-eastern side of Railway Approach, Brockley, and a one-storey shop in front of No. 2, Foxberry Road, on the application of Messrs. Webster and Forbes, on behalf of the trustees of the late James Martin.

Erection of a building upon a site abutting upon Dantzic Street, Earl Street, and Providence Place, Southwark, at less than the prescribed distance from the centres of the roadways of the said streets. on the application of Messrs. C. Yates and Co., on behalf of Messrs. R. Hoe and Co.

Erection of four blocks of working-class dwellings abutting upon the southern side of Hastings Street, St. Pancras, and the western side of Tonbridge Street, with an irregular open space about such buildings, and with projections, external steps and gangways in front, on the application of Mr. A. Davis.

Construction of a one-storey superstructure to a portion of the underground sub-station at Shorts Gardens, Holborn.

Construction of additions at the electricity generating station situated on the eastern side of Grove Road, St. Marylebone.

Erection of a building on the western side of Tower Bridge Road, Bermondsey, to abut also upon the southern side of Tanner Street, on the application of Messrs. Western and Sons, on behalf of the City of London Brewery Company, Limited.

Erection of a one-storey building on the western side of Upper Street, Islington, northward of St. John's Place.

Erection of shops at Nos. 45 and 46, Rostella Road, Wandsworth, to abut also upon the north-eastern side of Thurso Street, on the application of Mr. F. G. B. Crawley, on behalf of Mr. W. Newman.

Erection of houses to be inhabited by persons of the working class on the sites of Nos. 17 and 19, Crosby Row, Southwark, at less than 20ft. from the centres of Plaintain Place and Dove Place, and exceeding in height the width of those streets, on the application of Mr. J. J. Freeland, on behalf of Mr. T. B. Benton.

Erection of a building on the south-western side of Dantzic Street, Southwark, abutting also upon St. George's Market and the roadway leading out of the north-western side of St. St. George's Market, on the application of Mr. W. F. Hurndall.

Erection of buildings on the northern and southern sides of Ferry Street, Lambeth, at less than the prescribed distance from the centre of the roadway of such street, on the application of Messrs. Buckland and Gerrard, on behalf of Doulton and Co., Limited.

Works in Progress and Completed.

BURGH HEATH, SURREY.—The new church of St. Mary has been dedicated. The building has been erected at a cost of about £5,000, and seats 400. Mr. Alick Thomas is the architect.

CALCUTTA.—The City Corporation has accepted (subject to formal Government sanction), the tender of Messrs. Clayton, Sons and Co., of Hunslet, Leeds, for the construction of a steel water tank to hold 9,000,000 gallons. Amount of tender, £91,367. Competition for the contract was open to the world.

DERBY.— A new Congregational Chapel is being built in Ashbourne Road. The building, which is designed to seat 500 persons, will cost £3,000.

ECCLES.—The new Eccles Rubber Co. are again extending their premises in Monton Road, Eccles, their architect being Mr. W. Canning, of Manchester. The reinforced concrete floors, with granite finish, are being carried out by Messrs. Homan and Rodgers, Manchester.

HARROGATE.—The erection of a roller skating rink will be commenced immediately. Mr. J. Houfe is the architect.

HEXHAM.—The erection of eight six-roomed cottages, suitable for professional and business men, has been commenced. Each site will cover about 900 square yards. The estate is about one mile from Hexham station, and near to the Hydro. Each cottage will command a fine view of the surrounding country. The planning of the estate has been entrusted to Mr. Ed. Cratney, architect, Wallsend, who, at the recent Model Cottage Exhibition at Walker, was awarded medals in every class for cottages.

MONKWEARMOUTH.—A new Carnegie Library has been commenced, to cost £10,000. The library will be arranged on the "safeguarded" open access system. The elevations are designed in a quiet treatment of free Renaissance, the walls will be built of Withnell bricks, with Springwell stone dressings, and the roof will be covered with blue Welsh slates. The floors of the main rooms will be laid with maple wood blocks. The whole of the woodwork in the main rooms and the interior fittings will be executed in oak. The building has been designed and is being carried out under the supervision of Mr. Edward Cratney, of Davidson and Cratney, Wallsend and Sunderland, the designs being selected in competition. The contractor is Mr. Joseph Huntley, of Sunderland, and the carving will be executed by Mr. C. Neuper.

NEWCASTLE: BENWELL.—A new Carnegie Library has been completed here at a cost of £5,500. The contractors were Messrs. J. Parkinson and Sons, Ltd., Newcastle, and the whole of the work has been carried out under the direction of the city architect, Mr. F. H. Holford. This is the fourth branch library in the city, the three others having been provided by Ald. Sir W. H. Stephenson, at Elswick, Heaton, and Walker.

NEWPORT, MON.—A new Y.M.C.A. building will be started this month. The cost is estimated at £7,500.

TIREE (HEBRIDES).—A new pier is to be built here in Gott Bay. It will be a monolith reinforced concrete structure, 520ft. long, with a boat slip 170ft. long on the harbour side, with an open viaduct 204ft. long, constructed to join the pier head, which will be hammer shaped, 150ft. long. The engineer for the trustees is Mr. G. Woulfe Brenan, M.Inst.C.E., and the engineer for the Secretary of State for Scotland is Mr. Walter G. Coles, Edinburgh. The estimated cost is £13,000.

WIGAN.—A new public hall, to be known as the New Pavilion, is being erected here from the designs of Messrs. J. B. and W. Thornley. The roof has a clear span of 112ft., carried on steel stanchions independent of the walls, and the steel construction is of elaborate design. The ventilating arrangements include a Shorland's latest extractor at the top of the dome, which is 24ft. in diameter. A feature is the floor, which is of maple, so that the hall can be used for roller skating, a pastime which is at present the rage in all the large towns and cities. The hall is also so constructed that it can be used for political meetings, dances, concerts, also as a circus or music hall. It is expected that the holding capacity will be 3,500. The whole of the steel work has been designed, manufactured, and is being erected by Messrs. J. Booth and Sons, Hulton Lane Steel Works, Bolton. The brick and woodwork by Messrs. John Johnson and Son, Caroline Street, Wigan. The cement and plaster work by Messrs. J. B. Johnson and Co., Liverpool, and the slating by Messrs. J. Liptrot and Sons, Pemberton.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

EARTHQUAKES AND FRAME BUILDINGS.

The catastrophe at Messina and the other towns in the neighbourhood has served to teach a further lesson in regard to what should and what should not be the nature of building construction in districts subject to earthquake shock. The Messina disaster, like those of San Francisco and Kingston, Jamaica, was not primarily due to some overwhelming action of nature such as caused the destruction of Pompeii, Herculaneum, or even the recent eruption of Mont Pélée, but to the secondary effects of what can only be called inefficient building—inefficient in so far that it did not resist earthquake shock, for which it was never designed. The building construction of Messina was, indeed, more frail than San Francisco, though the latter city had cheaper and less permanent erections as a whole, for it was a town largely of timber-frame dwellings. Messina was a town of greater permanency with regard to resistance to the decaying influences of time and the ravages of fire, but it has been proved that it suffered more by earthquake shock than San Francisco, for, destructive though it was, comparatively much less damage was done; and the chief destruction at San Francisco was attributable to the fires that followed, and which the timber-frame buildings and the more expensive and larger structures in the narrow main streets were ill able to resist, the disastrous effects being heightened also by the absence of water for contending with the flames, due to the destruction of the city's water mains. Both Kingston and San Francisco were passing through the stage of elementary development from a nucleus of timber-framed construction, erected by early settlers and colonists, which, though it had the merit of economy and rapidity of dwelling, was obviously unsuitable for the later civic development, where fire protection becomes of such great importance. Messina, on the other hand, was no mushroom growth, and its new buildings were erected with due regard to Italian traditional methods of construction, and with some attempt at civic planning and fire protection. Loss of life at San Francisco and Kingston was small compared with Messina, and the magnitude of the latter is directly attributable to its "superior" construction, strange to say. But that superiority was only as regards resistance to weather, wear and tear, and fire—against earthquake shock Messina was even less prepared.

The first lesson to be learnt from this disaster at Messina is as to the manner in which to construct buildings that may be subjected to earthquake shock. There are many parts of the earth which are more or less frequently subjected to more or less severe earthquake shocks, and the towns in such districts are often of considerable magnitude, so that lives and limbs of thousands of persons may be endangered and valuable property wrecked, resulting in ruin to the inhabitants and others who have invested capital therein. The complication of modern civilisation and the increased magnitude of modern buildings have made the problem of constructing buildings to resist earthquake shock take an importance that was never realised in the past, and these catastrophes at Messina, San Francisco, and Kingston have brought the problem into prominence. San Francisco's earthquake put several methods of building construction to the test, and Messina has confirmed the conclusions arrived at from a study of the effects evidenced at the former. It is now about 12 years since the Japanese Government issued a report upon buildings to resist earthquake shock, which contained some very valuable recommendations. That report was concerned with timber-frame dwellings, and, briefly, it may be said that the advice was to bolt every part of the construction together (floors, walls, and roof), and build the structures one floor high and with as light wall construction as possible. In Japan, of course, the walls often are not walls (if we may use the paradox)—they are simply screens of mats, paper, or cloth. Such a construction may be all very well for scattered dwellings, but is impossible for a modern large European or American city. However, the principle of bolting together all parts of the building holds good for larger and heavier buildings. In earthquakes, eye-witnesses have agreed in recording, the earth is raised and depressed just like the surface of water—there are distinct waves of earth that travel forward like billows on the sea. The simile is close, and we may draw some conclusions from it. If we wish our ships or rafts to stand the racket we take care they are strong enough to act as beams resting at the ends on the points of two waves. The ship is rigidly framed together and rides the waves. It is strongly made so as not to break its back. To deal with earthquake waves we might presumably adopt a somewhat similar construction, framing the parts together, rigidly connecting all, so that it may float on the waves and act as a beam between two waves raised, say, at its extreme edge. So far as we can judge, that appears to be the method of construction that does successfully resist earthquake shock. In San Francisco there were a number of steel frame buildings, and a few reinforced concrete buildings. These all withstood the shock, that is to say, they did not fall to the ground like a pack of cards. But the steel frame structures were in some cases distorted and warped, and the walls suffered destruction, for they had never been built with any idea of having to resist an earthquake. The foundation of a ship is homogeneous, i.e., raftlike, but the foundations of most of the steel frame buildings were independent and rose and fell unequally like a series of floats. If they had all been standing on raft foundations they might have been tipped about at a great angle, but would have come to no harm, and if they did not recover their equilibrium they could have been placed on an even keel by removing the earth eminences under them or by raising them by jacks and filling up the depressions. The walls should have been securely tied to the framework, so that they, too, would have kept in place when out of the vertical. The reinforced concrete buildings stood even better than the steel frame structures, for their construction was more monolithic in character. Reinforced concrete is noted for its elimination of vibration. Reinforced concrete walls have elasticity, and are one with the rest of the building, so that they cannot come away. At Messina the same lessons are to be learnt. So far as we can learn at present, the few steel frame and reinforced concrete frame buildings remain standing, but all combination structures of steel girders or reinforced concrete girders and floor slabs resting on brick walls have fallen—the walls were shaken out, and down fell the floors. The solution of the problem, then, appears to lie in the construction of rigidly connected frame buildings, preferably of reinforced concrete with reinforced walls banded to the frame, and the foundations of raft form and not independent. On this basis architects and engineers will have no difficulty in ascertaining the possible stresses, and in effectually safeguarding a building from collapse, if subjected to earthquake shock

The Messina catastrophe should serve as a warning and a lesson confirming other recent catastrophes; and it is to be hoped that the architectural and engineering professions will do their best to mould public opinion into a better appreciation of the importance, firstly, of fire-resisting construction and fire-preventive planning, and in districts where earthquakes are probable, to embark on an era of rebuilding at once in accordance with the now ascertained principles of how to construct buildings to resist shock.

The public does not grasp the significance of even such disasters as these earthquakes, nor the great fires that have destroyed large towns; and, indeed, it is evident that the architectural and engineering professions, and public officers appointed to safeguard us against fire and bad construction, have failed to learn the lesson completely, although it has been taught often enough in all conscience. No proper regard is paid to fire protection, either as regards the limitation of cubical contents, separation of risk, width of street, fire-resisting construction, and fire-extinguishing appliances in the erection of modern buildings. There are regulations, but they are meagre, and every building owner seems to seek to evade them instead of trying to go one better and interpret them fully. It is, of course, attributable to lack of public interest and lack of public knowledge and understanding, but that can only be affected by a campaign of professional advocacy. This policy of laissez faire among the architectural and engineering professions and officialdom should end. The insurance companies should have been the first to recognise the advantage of fire-resisting construction and improved planning, and in their own interest should have fostered it by offering inducements to building owners; but they have been strangely lax in the majority of cases.

MAKING CEMENT WITHOUT BURNING ALL INGREDIENTS.

Some patents have recently been taken out in the United States by Mr. Henry S. Sparkman and Ellis W. Lazell—two well-known cement chemists and engineers—for a process of cement manufacture which is novel and almost startling. Instead of making a cement by the ordinary process of burning the ingredients, and then grinding the resulting clinker, by this new process a material is produced by admixture and burning that is called an "accelerator," which when added to other unburnt constituents found in cements and limes, renders them active cements. Thus if the accelerator is added to mixtures of lime and clay, shale, and other siliceous material in their natural condition, a cement that appears to be practically the same as artificial cement made by the ordinary process is produced. The accelerator may also be used with natural and other cements and hydrated lime and trass. The accelerator consists of calcium aluminate made from lime and Kaolin clays, bauxite, or other high alumina materials. Hydrated lime that does not exhibit any hydraulic properties becomes hydraulic and has high strength by the incorporation of the accelerator in large quantity, while a small proportion renders the lime valuable for wall plaster. The cements made by the addition of the accelerator to other ingredients entering into the composition of Portland cement can be regulated in strength by the proportion of the accelerator added, while the setting time is regulated by the use of suitable proportions of retarders, such as gypsum.

A REINFORCED CONCRETE AQUEDUCT.

By Robert S. Walker.

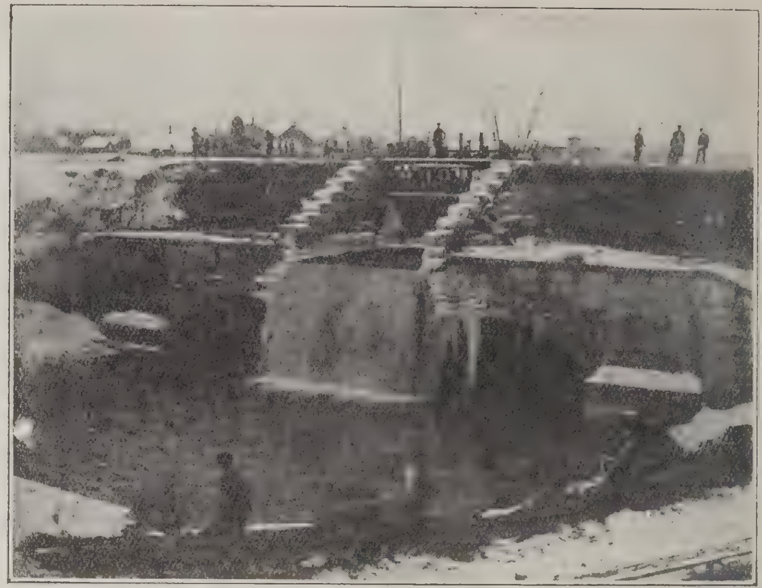


FIG. 1.—OLD AQUEDUCT WITH SLUICE GATE OPEN TO DRAIN CANAL.

The work here illustrated was carried out for the State of New York at Durhamville, near Oneida, to replace an old stone structure which carried the Erie Barge Canal across the Oneida River, and had become so dilapidated as to cause several bad washouts. It may be mentioned that the canal at this point is part of a 60-mile level stretch between locks, so that the seriousness of a washout can be well imagined.

The work of replacing the old structure had of necessity to be carried out in midwinter, so that navigation should not be interfered with in any way. Furthermore, as is customary in N.Y. State, all the canals are drained off every winter, suitable intervals being chosen along the route where a river or stream is convenient to carry off the water, and sluice gates built in the canal banks for this purpose. Such a set of gates are located at the Durhamville aqueduct, as will be noticed from Fig. 1, which shows the canal being drained off.

Work was commenced in November, before all the water had run off, in order to save time, since the contract called for the completion of the work in the first week of the following May, this being the usual time for navigation to be resumed.

It will be noticed from Fig. 1 that the old structure consisted of two arches, so the method of carrying out the work devised was to place cofferdams across the up and down stream ends of the eastern arch, and in this way divert all the river through the remaining or western arch. Then centrifugal pumps were installed outside the down stream cofferdam, and the water was pumped out of the remaining space. Cofferdams were also built across the canal on either side of the works, to take care of any water that might accumulate in the canal basin. As already mentioned, the canal was 60 miles long between locks, so that quite a large amount of water was expected to accumulate through drainage, etc.

Just as soon as the intervening space (which hereafter we will term the "Hole") was pumped out, the work of tearing out the arch above it, and one half of the middle wall, was proceeded with. Dynamite was used to great advantage on this operation. After all the débris had been cleared out, and the space straightened up, the pile driver was lowered down and the work of driving the foundation and sheet piles for the eastern buttress wall and middle wall started. Fig. 2 shows the pile driver at work in the hole. At first sight this appears a fairly simple set of operations, but I would like to point out the series of troubles and mishaps that occurred ere the pile driving was completed. First, the old stonework was all laid on the then usual foundation of large timbers, simply hewn on the four sides and placed in the form of a cribwork. At the bottom, timbers, approximately 14ins. by 14ins. and from 30 to 35 ft. long, were laid lengthways with the river. On top of these, shorter lengths were laid at right angles to the first layer. Then again another row of the long ones was laid parallel with the first. All were spaced out 6 inches apart. On account of this cribwork effect, the difficulty of keeping the hole free from water can be imagined.

Secondly, just as the last row of piles was being driven, preparatory to concreting, a heavy thaw set in, with a downpour of rain, the result being that the river flooded. Like all mountain rivers, it rose at a tremendous rate, and in less than six hours the water was rushing over the top of the up stream cofferdam. Soon afterwards the dam went out, as also the down stream one. The water still continued to rise till it was finally pouring over the top of the old arch on the up stream end. Fig. 3 shows this condition of affairs very clearly.

In Fig. 4 the hole can be seen full of water, and the pile driver immersed, except the smoke stack. This is interesting when compared with Fig. 2, which shows the hole before the flood. Among other troubles the ice in the river broke up and dammed across the arches, and had to be dynamited to prevent serious floods further up the river.

At this time another mishap took place, which proved to be by far the greatest setback the engineers experienced. The Mohawk River, which flows quite close to the canal, about ten miles west of the work, rose to an unprecedented height through the thaw and rain. As a result it flooded its banks and poured over into the canal. The tremendous rush of water proved too much for the coffer-dam near the work, which, of course, had never been designed for such a condition. Consequently this dam went out, and the water poured down over the existing arch into the hole, as can be seen in Fig. 5. This arch, already weakened by the removal of the eastern one, soon collapsed under the great weight of the water, at the same time pushing over the remaining half of the middle wall. Thus, not only was the middle wall, which served as a dam on one side of the hole, broken down, but the entire site for the new work was covered with large stones averaging about 5ft. long, two feet wide, and a foot thick, under about 12ft. of water. After a good many schemes had been proposed, it was finally decided to clear a space right along the line of the old middle wall, divers being employed for this work. After this space was cleared, a long coffer-dam was erected in place of the old wall. This was made of two rows of 7ft. sheet piles secured to 6ins. by 6ins. cross timbers, the two sides being spaced about 2ft. 6ins. apart. The dam was made in sections, and then lowered into the water, and sunk by means of large stones. When all the sections had been set in place and bolted together, the space between the two sides was filled with clay and well puddled. After this the coffer-dams were rebuilt, on the two ends of the arch and in the canal, and the hole pumped out once more.*

Altogether six weeks were entirely wasted so far as any progress on the new work was concerned, owing to the hole being inundated, and the time occupied in rebuilding the dams.

The pile driver did not appear to have suffered much as the result of its six weeks' immersion, and after a few light repairs was soon put into commission again. The piling was all finally completed for the eastern arch and middle wall, and the concrete slab put in for the river bed when passing under the aqueduct. This was about 2ft. thick and

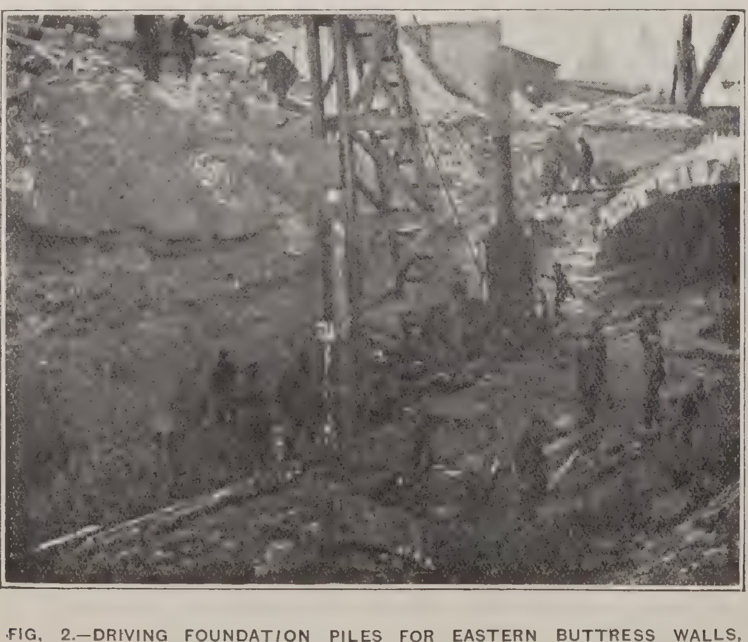


FIG. 2.—DRIVING FOUNDATION PILES FOR EASTERN BUTTRESS WALLS.

---

*A second flood occurred soon after the centre coffer dam had been completed, which overturned it, and washed out practically all the clay which had been puddled into it.

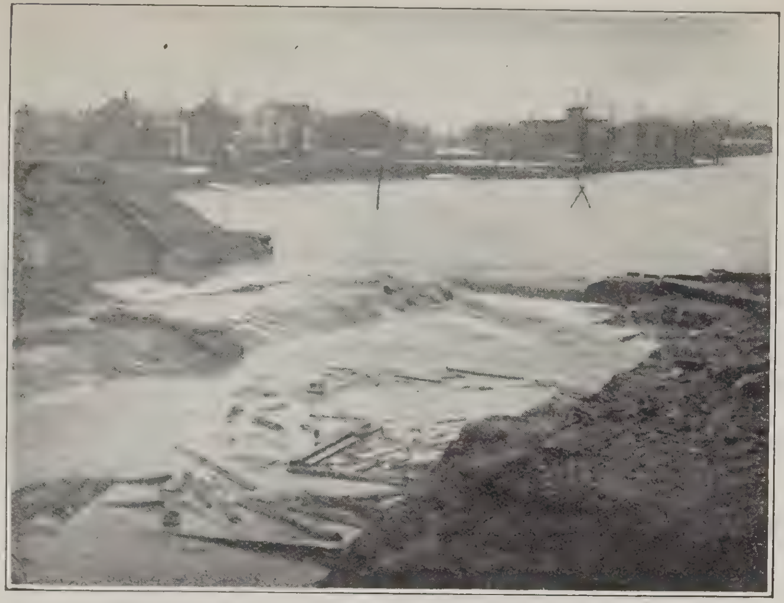


FIG. 3.—WORKS SUBMERGED DURING FLOOD OF RIVER.

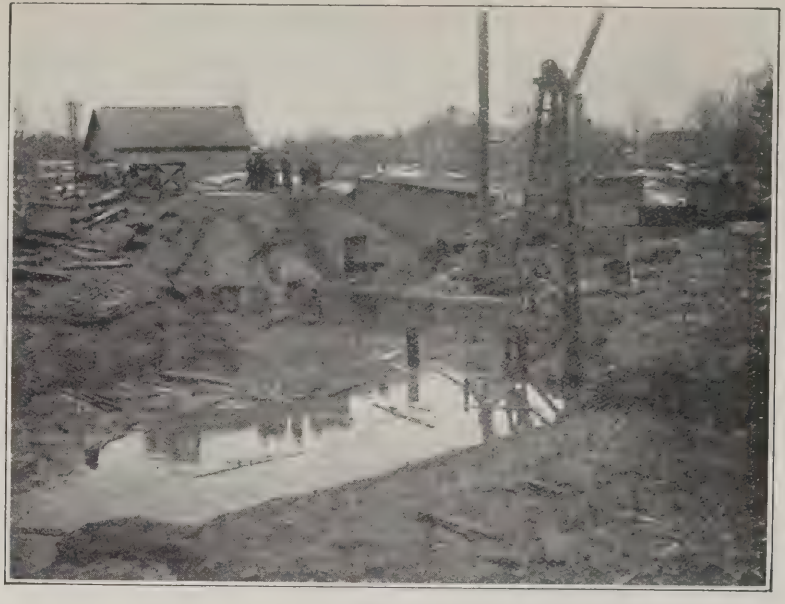


FIG. 4.—"HOLE" FULL OF WATER, SHOWING PILE DRIVER—IMMERSED TO SMOKE STACK.

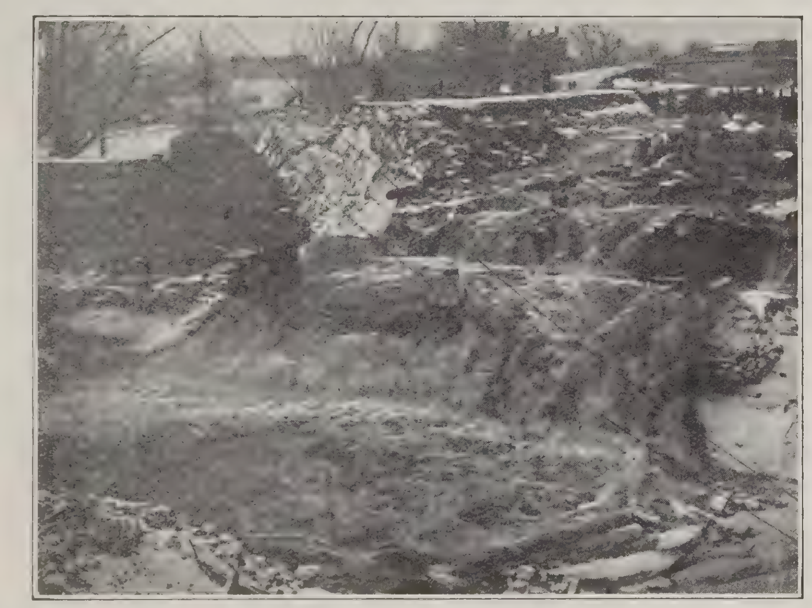


FIG. 5.—WATER RUSHING OVER WESTERN ARCH AFTER CANAL COFFER DAM HAD GIVEN WAY.

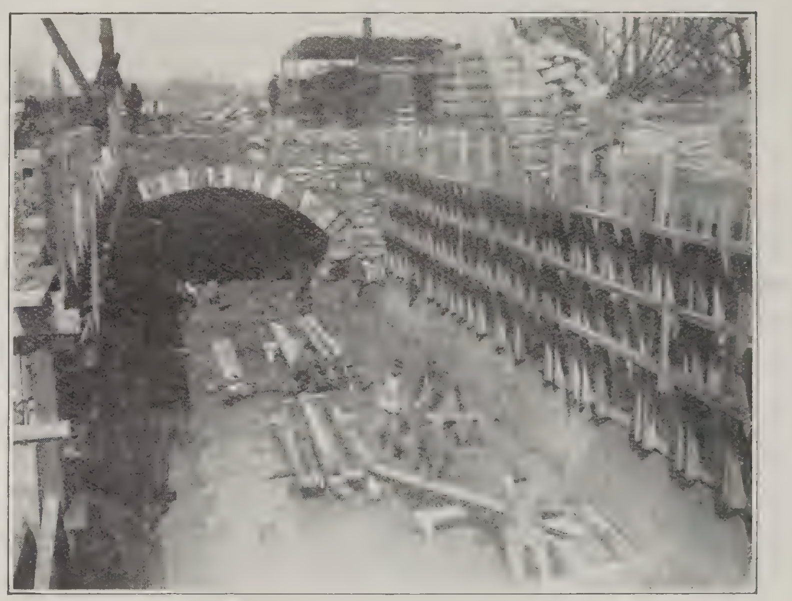


FIG. 6.—SHOWING NEW RIVER BED AND PANEL FORMS FOR BUTTRESS AND MIDDLE WALLS IN POSITION.

A REINFORCED CONCRETE AQUEDUCT.

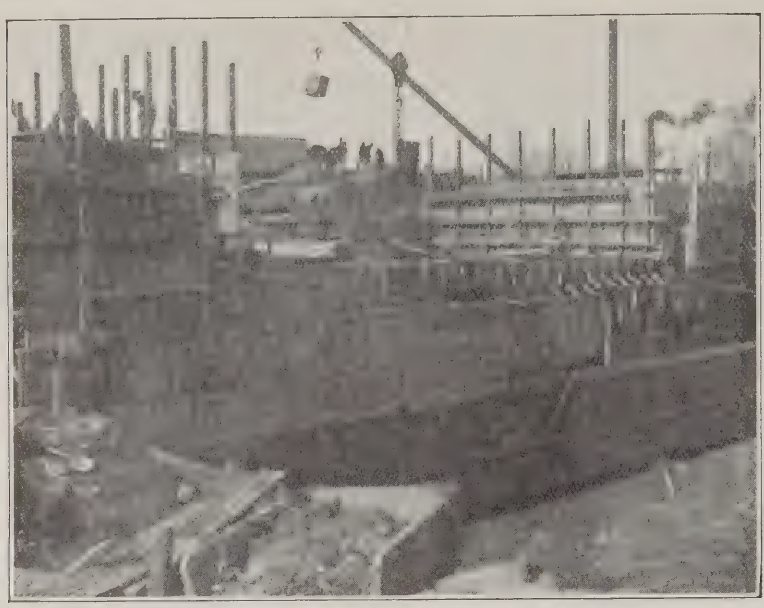


FIG. 7.—MIDDLE WALL COMPLETED, AND FORMS FOR CANAL SIDE WALLS IN POSITION.

reinforced with 1in. steel rods placed at right angles to the stream and spaced 12ins. apart. The next step was the erection of the forms for the buttress wall, wing walls, and middle wall. Figs. 6 and 7 give a good idea of the works at this stage.

The forms for the buttress and middle walls were made in the form of separate interchangeable panels, so that they could be used over again on the western arch. All these had been made up while the tearing down of the old work was proceeding, and stacked away, so as to be ready when required.

The panels were made up of 2in. matched plank dressed on one side, 8ins. wide, and about 10ft. long, as shown in Fig. 8. It will be needless to describe them in detail, as the figure clearly shows their construction.

The process of erecting the panels consisted in fixing the bottom row by stay lasts, and then placing another row on top, so placed that the joints in each row coincided. Long 6in. by 6in. timbers were then placed vertically at the joints, just fitting into the spaces left between the short 6ins. by 6ins., owing to the 3in. projections at the ends of the panels. Other rows were added in like fashion to suit the height of the wall. Outside the vertical 6in. by 6in. timbers, horizontal 6in. by 6in. were placed about 2ft. 6ins. apart. This set of operations was done on both sides of the proposed wall. Iron rods, 5-8ths inch diameter, threaded at both ends and fitted with nuts, were then passed through the horizontal 6in. by 6in., spaced about 4ft. apart, and so arranged as to clear all the vertical timbers, merely passing through the 2in. planking. Spacing pieces of 2ins. by 4ins. cut to the required width of the wall, were fitted inside the forms quite close to the bars, and the nuts screwed down so as to draw the two sides of the forms tight on the spacing pieces. When the forms were being filled, the 2in. by 4in. were knocked out as the concrete reached them. After the forms were removed the projecting ends of the iron rods were cut off with shears, and a little cement put over the ends. This method of holding the forms proved very successful, as not the slightest bulging occurred, despite the fact that the middle wall was 4ft. thick, and was filled to a depth of 8ft. to 10ft. at a time.

While these forms were being filled, work was started on the supports for carrying the forms for the canal bottom, which consisted of concrete beams and a 12in. slab above, monolithic with them.

These forms were made in the shape of troughs of the required length and dimensions for the concrete beams. The ends were cut off on a slight taper to facilitate matters when removing them. All these troughs were made early in the work, so as to be ready to put in place when required.

The supports were made of 6in. by 6in. timbers, and five legs were equally spaced across the width of the arch. Each leg was clamped to a common 6in. by 6in. cap piece. After all the sets of supports had been fixed up, they were levelled and spaced out with centres corresponding to the centres of the I beams. Then the troughs were lowered right on to them, and firmly secured to one another by pieces of 2ins. by 4ins., as shown at xx in Figure 9. At the two ends of the arch the supports were doubled to take care of the extra weight of the side walls of the canal. As soon as all the supports had been braced up, and secured in such a way that they would not be moved by the current of the river when turned through, the two coffer-dams were pulled out and the river let through. The dams were then rebuilt across the space between the new middle wall and the old western buttress wall. The pumps were moved across, and the water pumped out, thus enabling the pile drivers to be set up, and the piling driven for this part of the new work.

(To be concluded.)

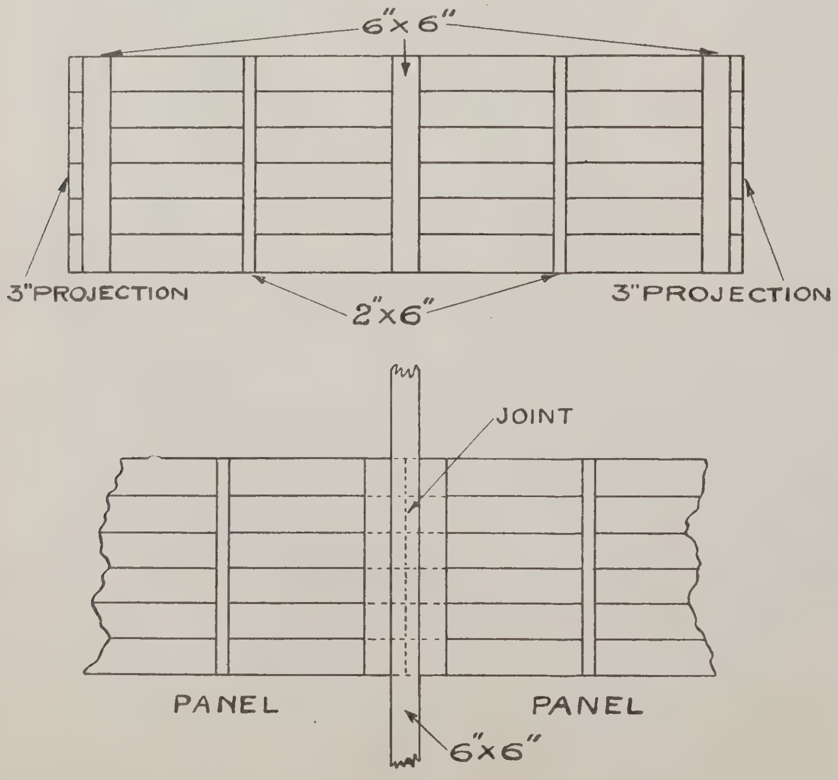


FIG. 8.—PANEL CONSTRUCTION OF FORMS FOR WALLS.

MONOLITHIC CONSTRUCTION AND METHODS OF CALCULATING STRESSES.

(Concluded from page 11, No. 726.)

The moment of resistance in a reinforced concrete beam in practice varies considerably across the width, because of the natural practical differences of proportioning the amount of reinforcement to the bending moment at each point. But it does not pay as a general rule to go into the calculations of beams too closely, and even if we did, we should probably be just as much at sea, because the theory is hardly sufficiently accurate as yet, and it must ever be approximate.

A test, therefore, to be of value to practical constructors, should be of a practical character. The conditions should certainly be carefully determined in a laboratory manner, but the lessons to be learnt from such tests will be of most service to the practical designer. At present the designer works upon abstract statical theory, from which many important factors have been eliminated. We require full size tests under actual conditions to show how fully the latter conform to the theory. We shall by such means obtain facts for the deduction of abstract theoretical determinations, and we may, at the same time, learn a good deal about the manner in which we should reinforce beams adjoining and over the supports, and, perhaps, learn how to effect economies.

The shear stresses in such monolithic construction become very intricate of analysis, and it perhaps hardly repays investigation in the present stage; it would be far better first to have experimental data to work upon, as we should get a better clue to the points that require investigation, and should save labour in working.

There are also other points that require elucidation by means of experiment, such as the effect of inequality in the heights of the supports due to the inexactitude of practice, and the variation in quality of materials. An alteration in the heights of supports in steel-

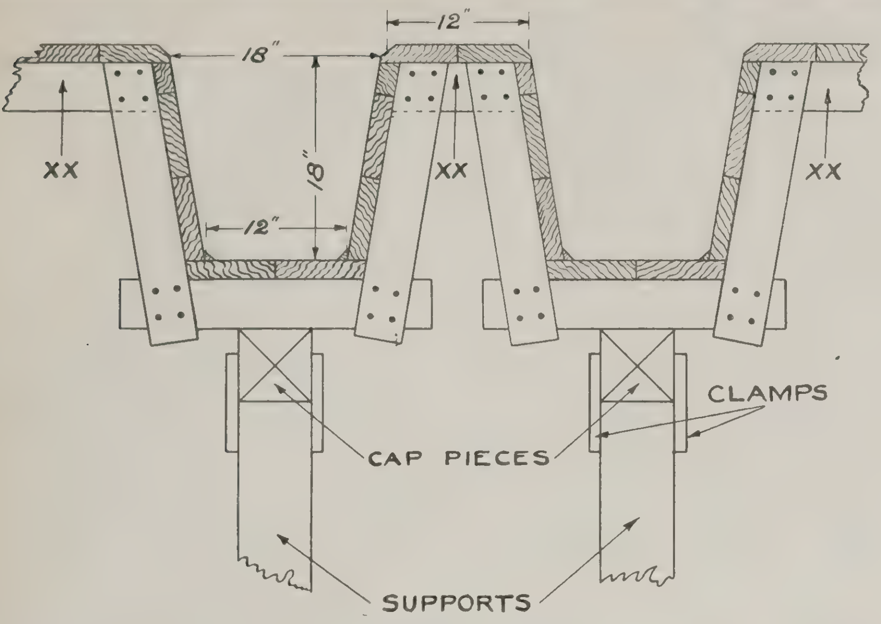


FIG. 9.—A REINFORCED CONCRETE AQUEDUCT: SECTION OF FORMS FOR BEAMS IN CANAL BOTTOM.

work design has often been shown to theoretically greatly affect the bending moment, and throw stresses upon continuous beams that will much exceed those assumed in designing for the supports to be level. Consequently, unless we are content to have a very large factor of safety or disregard the safety of a structure, we are forced to take special precautions to ensure the conditions of theory being carried into practice. If such conditions apply with steelwork, may they not apply equally stringently to reinforced concrete? On the other hand, the nature of reinforced concrete in itself may be such as to reduce the deleterious effect of such variations in the height of the supports —we rather think its does, for reinforced concrete, when it is being cast, will adapt itself to minor inequalities, and, at the same time, possesses considerable ductility and flexibility, though the latter quality is possessed probably by steel in a greater degree. Yet there is one feature that off-sets these good points, namely, the frequent want of rigidity in the centering; this, if it can be proved to be an element of danger, can be overcome by the provision of stronger and more rigid centering, but, in the want of experimental data, we do not know whether any precautions of this character are required.

Of course, a point that constantly arises, and will occur to the minds of most, perhaps, at this point of the argument, or before, is the question of the great risk of inaccuracy in the disposal of the reinforcement due to incompetent and negligent workmanship, but this can be overcome by taking special precautions, and every year will effect improvement in this direction, for the workmen in the employment of specialists, and even the building trade generally, are becoming more and more familiar with reinforced concrete as a system of construction, while, at the same time, there are various methods which may be adopted to guard against such errors and neglect. This aspect does not really directly affect the subject under discussion, which is the determination of the conditions that are present in a continuous monolithic reinforced concrete construction.

There is a great need for experimental investigation. We have above dealt only with beams, but we have before referred to the inadequate experimental investigation into the strength of floor slabs. Particularly is this inadequacy seen with floor slabs more or less fixed at the supports, and especially on all four edges. How much of the floor slab may be taken as acting as the table of a T beam, and how much constitutes the intermediate portion suspended therefrom, as also, how much stress we may throw into the table of the T beam, and the variation of stresses existing therein, are all points arising out of this subject, that require close and patient investigation.

The fact is we are all very much in the dark. Practical designers have learnt a great deal from the results of failures, and from the results obtained in their own practice, but the information they have been able to gain in this way is very meagre. Fortunately, the large factor of safety that is usually adopted covers up many inaccuracies and much ignorance. The specialist designer, as a rule, exercises a good deal of common sense in the matter. He recognises the futility of elaborate calculations, and even if we were to be provided to-morrow with a very full and elaborate analysis of all the conditions appertaining to reinforced concrete in all its many forms, and the exact effect of various methods of designing and executing the work recorded, we should still be subject to the inequalities of workmanship and materials which render it necessary to maintain a fairly high factor of safety and render elaborate calculation needless and wasteful. Our calculations should be effected readily, but not roughly, but to conduct them only fairly accurately calls for considerable experimental investigation in order to provide us with the necessary information upon which to base either simple or elaborate theories and methods of calculation.

Before the Surveyors' Institution, on January 25th, Colonel Sir Duncan Alexander Johnston, K.C.M.G., read a paper on the Ordnance Survey, of which he was till recently director-general. The work has been in progress since 1784. No other country has a general survey on so large a scale, and it is being continually revised, as the face of the country is constantly altering from artificial and natural causes. New roads and buildings are made, enclosures are sub-divided or altered, new railways are constructed, the coast line and rivers alter, and in time the maps cease to represent the country as it exists. The Treasury therefore sanctioned in 1886 a revision of the 1 in 2,500 scale maps every twenty years, but this revision could not be commenced till 1894. In Great Britain the original survey was completed towards the end of the last century, and the work of the Ordnance Survey is now that of periodical revision of the maps. The extent of the undertaking may be judged from the fact that the Ordnance Survey publishes between 90,000 and 100,000 different maps.

TAKING OUT WEIGHTS IN IRONWORK.

By A. E. Fletcher.

The following rules, which are not to be found in the usual pocket-books, have been collected in the course of some years' experience, and have been found exceedingly useful. They are approximations, of course, but sufficiently near to be trustworthy for practical use, and the amount of time saved in hunting up tables of weights and areas, etc., is ample repayment for the slight trouble entailed in memorising them. In most cases they are slightly above the theoretical weights given in tables, which is rather an advantage, since commercial sections are generally rather full than otherwise in dimensions. The source of each rule is given where known to the writer, but the name mentioned may possibly not be in some cases that of the originator, as some of the rules have been used by ironmasters for many years.

Weight of Mild Steel Plate and Bars.

These generally being rolled a trifle full.
Per foot super. 1in. thick=42lbs.
Per foot super. $\frac{1}{2}$in. thick=21lbs.
or at the rate of $5\frac{1}{8}$lbs. per ft. super. for every $\frac{1}{8}$in. in thickness.

Flat Bars.

Find the area in sq. ins., multiply by 10, and divide by 3 = weight in lbs. per ft. run.

Note.—This rule being rather bare for mild steel, it is best to add 1-40th to the result.

Examples.

4 by $\frac{3}{8}$ wrought iron $= 1.5 = \frac{15.0}{3} = 5$ lbs. per ft.

8 by $\frac{1}{2}$ steel $= 4 = \frac{40}{3} = 13.3$

Add $\frac{1}{40}$ $\quad$ $\underline{\quad .3}$
13.6

Say, $13\frac{3}{4}$lbs. per ft. run.

Round Mild Steel Bars.

Bring diameter to $\frac{1}{8}$in., square this, and divide by 23. Result—weight in lbs. per ft.

Example.

1 in. $= \frac{8 \text{ by } 8}{23} = 2{\cdot}8$ lbs. per ft. (nearly)

or square the diameter, multiply by 27, and strike off the last figure for a decimal place.

Example.

2in. $= 4$ by $27 = 108 = 10.8$lbs. per ft.

The second rule is the easier when the diameter is an even number of inches.

Mild Steel Angle and Tee Sections.

Add the widths of flanges in inches, multiply by the number of 32nds in thickness, and strike off the last figure for a decimal place.

Example.

4 by 4 by $\frac{3}{8}$ L.
4 + 4=8 by 12 thirty-seconds thick,
=96, or 9.6lbs. per ft.
(J. J. Fletcher.)

Weight of Cast-Iron Columns.

These are troublesome to take out, even with the help of a table of areas of circles, but by the following rule are easily and quickly arrived at:—

Multiply the mean diameter (*i.e.*, the outside diameter minus one thickness) by the number of eighths in the thickness. Divide this successively by 5, 6 and 7, and add the whole together. This is the weight of shaft in lbs. per ft. run. This rule is very exact.

Example.

Say, column 6in. diameter and ½in. thick.

Mean diameter
= 6ins. = ½in. = 5½.
4 No. of eighths thick.

Divide	5	22
	6	4.4
by	7	.7
		.1
		27.2 lbs. per ft.

For base, cap and stiffeners bring all to cubic inches, divide by 4, and add ⅛. This allows for the rounding in the angles.

The above very useful rule was worked out by Charles Hoare, whose labours are not much remembered now, but who was one of the pioneers of the use of the slide rule and the inventor of the duodecimally-divided slide rule for the use of contractors. Although foreign to these notes, this digression may be pardoned in favour of the memory of a man who did a great amount of good work in his time, and whom some readers may possibly remember.

THE GOVERNMENT'S OUTPUT IN PUBLIC WORKS.

According to a valuable publication, "The Government's Record, 1906-1908," which has just been issued from the headquarters of the Liberal party, the total voted expenditure controlled this year by the Office of Works is £1,792,100. It is stated that the buildings for the extension of the National Gallery are making progress. An important improvement is found to be practicable which will reduce still more the risk of fire. All boilers for heating, etc., will be removed from the National Gallery and also from the adjacent National Portrait Gallery, and heat and electric power will be obtained from a station in the Orange Street Waterworks, which are Government property, on the opposite side of the street. Economy in working will result as well as safety. The remainder of the establishment at St. George's Barracks and the recruiting station are to be removed from the back of the National Gallery to Old Scotland Yard, thus reducing the risks of fire and affording space for further enlargement. Through the generosity of the late Sir J. J. Duveen, an extension of the British Art Gallery has been arranged, to be carried out at his expense. The enlargement and improvement of the Scottish Law Courts is in progress, as also the building of the Duke of York's School near Dover, and the new Admiralty extension at Spring Gardens, and many other important buildings. The British Museum extension is in hand, and the estimated cost is £200,000. In the last three years the following buildings have been completed:—The new Royal College of Science at Kensington (£320,000); the third block of new Admiralty Buildings in St. James's Park, completing the scheme begun in 1895 (land and buildings, £1,000,000); the new Post Office at Aberdeen (£55,000); the new magnetic observatory for the Royal Society at Eskdale Muir (£20,000); the new Embassy House at Madrid (£52,000).

The programme for new buildings or for the enlargement of existing buildings includes some 50 separate and important works in progress, and the following are noted, with the estimated cost:—

G.P.O., King Edward VII.'s Building, £316,000.
Blackfriars Power Station, £49,265.
Western District new P.O., £69,000.
Birmingham new Telegraph Stores, £85,000.
Bristol Head P.O. Enlargement, £40,810.
Hull new P.O., £58,000.
Manchester Newton Street new sorting office and branch P.O., £66,800.
Sheffield new P.O., £53,500.
Edinburgh P.O. Extension, £62,000.

With regard to the Ancient Monuments Acts, 1882 and 1900, it is stated that the guardianship of certain additional monuments included in the schedule to the Act of 1882 has been accepted by the Commissioners of Works. The Commissioners are in communication with the proprietors of other historic buildings and prehistoric remains with the view of taking charge thereof under the provisions of the Acts. Increased care is given to historic buildings such as Edinburgh Castle, where large sums are being spent to ensure protection against fire and better sanitary conditions for the occupants. Stirling Castle, Walmer Castle, and generally the castles taken over from the War Department as being no longer required for military purposes are carefully inspected and preserved. Private owners and antiquarian societies appear to recognise now that the Commissioners of Works are the only public body having legal powers to preserve such monuments, and an organised and trained staff is distributed over the country which can continuously carry on the work of supervision and reparation. The weakness of the position, it is pointed out, is that the Acts give no power to the Government (unlike other civilised Governments) to prevent the destruction or defacement of a monument which has not been placed under the Act. Under the National Galleries of Scotland Act, 1906, the buildings in Edinburgh known as the Royal Institution, the National Gallery, and the National Portrait Gallery, and Dunblane Cathedral, formerly vested in the Board of Manufacturers, have been transferred to the keeping of Mr. Harcourt as First Commissioner of Works. Among the numerous other matters dealt with in the report are the alterations in the House of Commons, where the ventilation improvements have now been brought practically to a conclusion. The internal stonework of that building has been further cleaned of paint and dirt, and new frescoes are to be added to the corridors. Mr. Harcourt has directed that the following fair wages clause shall be included in the building, engineering, and so far as practicable in all other contracts of the Works Department:—"The wages paid by the contractor to workmen employed by him on the execution of works shall be those generally accepted in each trade for competent workmen in the district where they are employed, and the contractors' wages books and time sheets for all workmen, so far as they relate to this contract, shall be open to the inspection of the Commissioners of Works or their representatives at such times as they may think fit."

REINFORCED CONCRETE SYSTEMS.

The Chain Concrete System.

(*Concluded from page 18, No. 726.*)

The illustration at bottom of page 19 in our issue of January 6th shows view of work in course of construction, namely, the erection of a carding factory at Cleckheaton, in Yorkshire, for Messrs. Critchley, Sharp, and Tetlow, of which Messrs. Howarth and Howarth, of Old Bank Chambers, Cleckheaton, are the architects. A complete view of the work in progress, the arrangement of the clips in the column reinforcement, and method of centering which the firm adopts are clearly shown. The trestles are thoroughly braced, and the folding wedges will be noted which lower the beam box, dropping it a few inches so as to ascertain if there is any deflection before striking the whole of the centering. The work of construction in the erection of this factory was carried out very speedily. In one particular case a derrick was placed on the floor and used only ten days after construction, when the forms had been removed. The roof of this building is used as a large tank, the length of which is 190ft., and the width 55ft. The capacity of the tank is 85,000 gallons. In addition there is a condensing plant weighing 7½ tons, erected on the roof. On p. 199 of our issue for December 30th, we gave an interior view of the same factory, showing the wide spans which are permitted in reinforced concrete without great depth of the beams. Such a factory is ideal for the cotton industry, for not only is the fire risk greatly reduced—the method of construction being one of the most fire-resisting known—but it is cleanly, and not subject to deterioration by the corrosion of the steelwork, etc. The cost of upkeep in a building of this

Chain Concrete Construction.

FLOOR OF SCHOOL IN COURSE OF CONSTRUCTION AT CASTLEFORD.

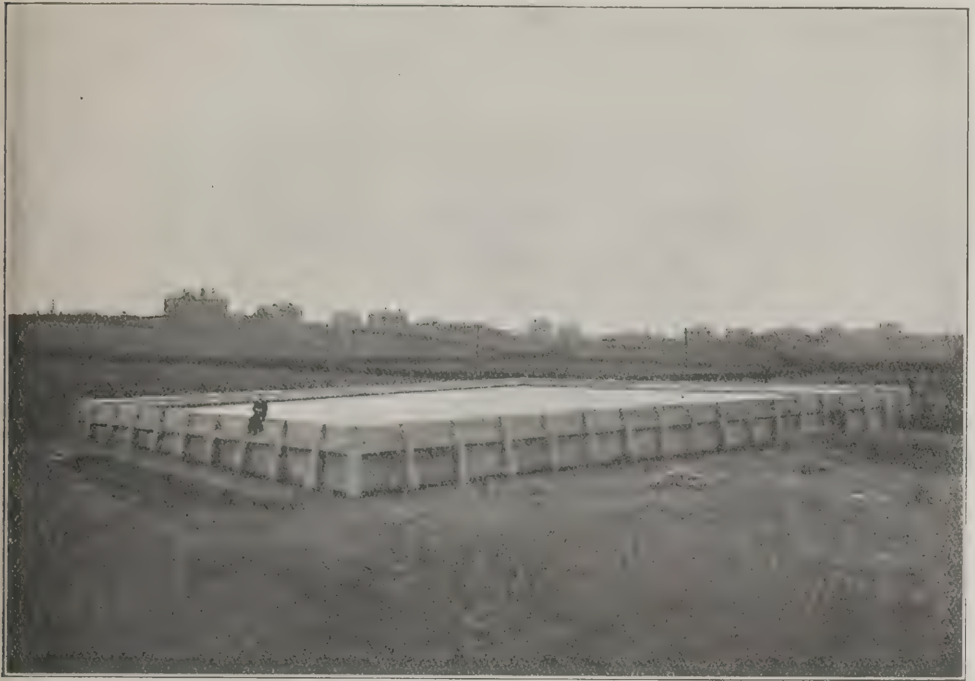


FIG. 7.—STORAGE RESERVOIR, PUDSEY, YORKSHIRE. CHAIN CONCRETE REINFORCEMENT. JOWETT KENDALL AND SON, ENGINEERS.

nature is extremely small, and the saving on this score alone must be very great in a building of this character compared with ordinary steel-frame construction.

The floors of the Cleckheaton factory are 3½ins. thick, finished with cokebreeze concrete for nailing boards. Through the building there is only one line of columns. In the basement these are 16ins. square, for the next two floors 14ins. square, and those to carry the roof are 11ins. square. The main beams running across the building have a span of 27ft. 3ins. from wall to column; they are 17ins. deep by 11ins. wide, while the secondary beams, which are arranged in three lines down the building, namely, one in the centre, and the others two on each side in the centre of the bays, are 11ins. deep by 7ins. wide. The columns are at 10ft. 6ins. centres. The distributed load of the tank is about 300 tons.

One important point in connection with reinforced concrete construction, namely, the freedom from vibration, has been given emphasis in this building. In a cotton factory, practically the whole is given over to machinery of an intricate and highly delicate character. Vibration in such circumstances is a serious consideration, and a steel frame structure has generally the disadvantage that it is subject to great vibration. It is very interesting to note that in this building, owing to the non-existence of vibration, the machines have been speeded ten per cent. higher than when working on wooden floors. The total area of the floors and flat roof in this factory is about 5,000 square yards.

Fig. 7 shows the storage reservoir, which has been constructed at Pudsey in Yorkshire. The walls, it will be seen, are only 8ins. thick, and they stand 9ft. above the ground level. The capacity of the reservoir is 500,000 gallons. It was constructed for Messrs. W. C. Forrest and Co., Prospect Mill, Pudsey, the engineers being **Messrs. Jowett Kendall** and Son, of South Parade, Pudsey. The construction is clearly shown by the photograph, and the working drawing (Fig. 8), showing that it consists of a wall 8ins. thick between buttresses, with a beam between near the top to stiffen the structure. The arrangement of the reinforcement, together with the patent clips is clearly shown on the drawing. The reservoir is faced with 1 cement to 1 sand ½in. thick.

As regards the general methods of calculations favoured by the Chain Concrete Syndicate, this is the ordinary customary theory which may be described as conforming generally to the recommendations of the Committee on reinforced concrete, appointed by the Royal Institute of British Architects.

Fig. 9 shows a view of steel Chain reinforcement for a bank strong-room at Leeds, carried out under the instructions of the architects, Messrs. Carby, Hall and Dalby, of Park Row, Leeds. The illustration shows the spacing of the bars and the rigid fixing of same by the special clips. The walls will be 10ins. thick when finished, with double steel-work.

The firm prepare their own designs for construction and execute the whole of the work themselves, which they claim is not only a responsible method of working, but as the patent rights are their property, no royalty has to be paid to the patentees, and that economy therefore is obtained. A great deal of work has been carried out in Yorkshire, and we give below a list of some of the more important works:—Cover to reservoir, Kirkireton Water Works, near Derby; retort house floors, at Wath-upon-Dearne Gas Works, near Rotherham; retort house floors, at Castleford Gas Works, Yorks; retort house floors, at Knottingley Gas Works, Yorks; foundations to chimney stack, The Mount Brick Works, Glass Houghton, Yorks; drill shed at Welbeck Street Schools, Castleford; floors, corridors and beams, Glass Houghton Schools; floors and flat roofs, Normanton Police Station; floors, etc., to piano warehouse, Castleford; floors, etc., Normanton Joint Hospital, Featherstone; floors and flat roofs, 5,000 yards sup., Carding Factory, Cleckheaton; floors and flat roofs, Heckmondwike; floors and flat roofs, Heap Riding Mill, Stockport; floors and balconies, Clay Pit Lane Barracks, Leeds; roofs, etc., to extensions, Beechwood, Roundhay, Leeds; floors to school buildings, Heaton, Bradford; storage reservoir, Prospect Mill, Pudsey; foundations for oil tank, near Rotherham; floors, corridors and roofs, Secondary School, Castleford; floors, etc., Millshaw Leather Works, Churwell, near Leeds; floors and roofs, Deanfield Mill, Morley; floors to drying room, Clifton Mills, Bailiffe Bridge; floors and girders to residence, Shadwell, near Leeds; and roof to concert hall, Church Street, Castleford.

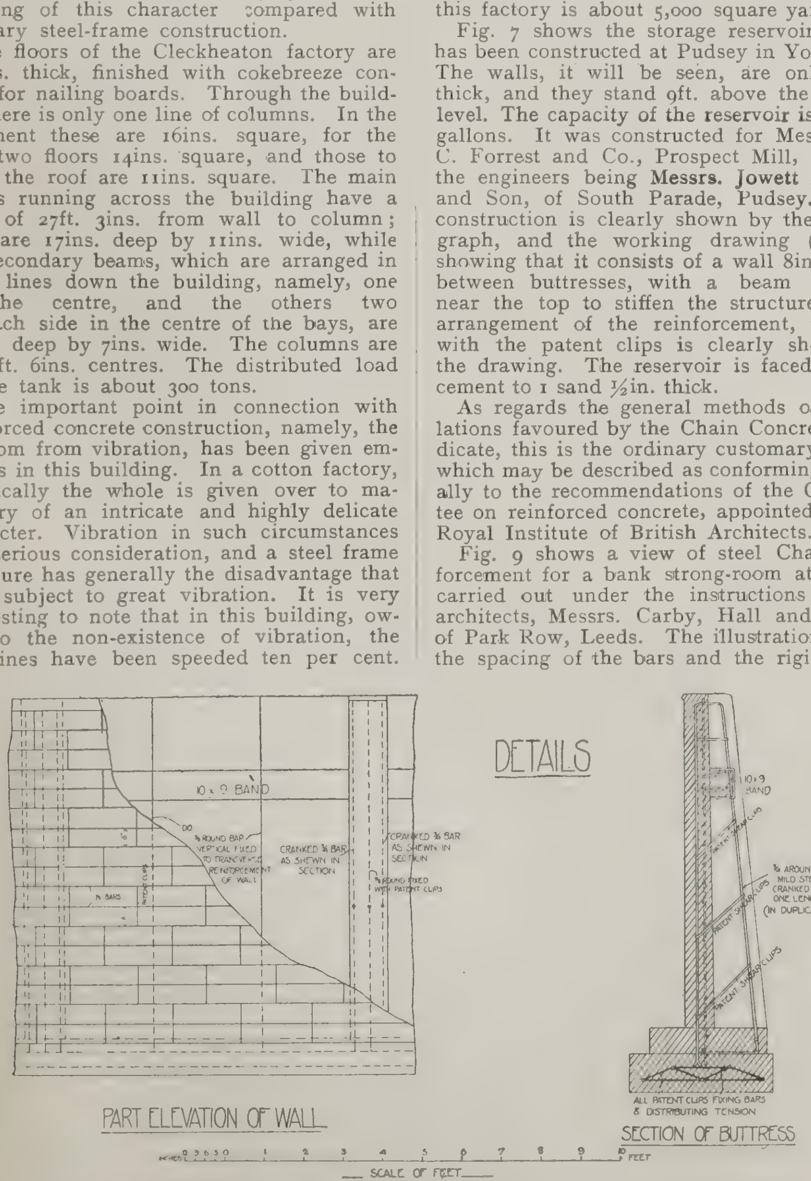

DETAILS
10 x 9 BAND
DO
⅜ ROUND BAR VERTICAL FIXED TO TRANSVERSE REINFORCEMENT OF WALL
CRANKED ⅜ BAR AS SHEWN IN SECTION
CRANKED ⅜ BAR AS SHEWN IN SECTION
⅜ ROUND FIXED WITH PATENT CLIPS
⅜ BARS
PATENT CLIPS
10 x 9 BAND
⅜ AROUND MILD STEEL CRANKED FROM ONE LENGTH (IN DUPLICATE)
PATENT SHEAR CLIPS
PATENT SHEAR CLIPS
ALL PATENT CLIPS FIXING BARS & DISTRIBUTING TENSION
PART ELEVATION OF WALL
SECTION OF BUTTRESS
INCHES 12 9 6 3 0 1 2 3 4 5 6 7 8 9 10 FEET
SCALE OF FEET

FIG. 8.—STORAGE RESERVOIR, PUDSEY, YORKSHIRE. CHAIN CONCRETE REINFORCEMENT. JOWETT KENDALL AND SON, ENGINEERS.

London's shortest street, it is claimed in a recent newspaper correspondence, is Hammet Street, Minories, E.C., which is 80ft. long, and contains only two houses, one on each side.

* * *

The Factory Department of the Home Office, it is understood, will be shortly transferred to the Board of Trade. The proposed transfer has been the subject of several departmental conferences, in which the weight of evidence in favour of the change has been acknowledged. The work of factory inspection is so closely associated with the operations in which the Labour Department of the Board of Trade has been engaged in recent years, that the transfer may be regarded as of the character of a natural development, and it may be expected to lead to many economies in administration, which are likely to have the further advantage of increased efficiency. The transference would, of course, occupy some little time in its completion.

* * *

Patent Act: Reprisals in France.—In view of the restrictions which have been imposed or are contemplated in other countries, upon the exercise of patents, the French Government proposes to amend the law of July 5th, 1844, which enacts that failure to exercise patent rights shall entail lapse of the patent. In the interests of French industry and commerce, a Bill has accordingly been drawn up which provides for an amendment of paragraph 32 of the law of 1844 in the following sense:—Patent rights shall be held to lapse in the event of failure on the part of the holder either to exercise his rights in France or in the French colonies for a period of three years after applying for his certificate, or to resume exercise after a similar interval, or secondly, in the event of only partial exercise of the patent in French territory. In the second event the Patent Courts will be invested with discretionary powers to call upon the holder of the patent to show cause why he should not exercise his rights in French territory "in an adequate degree." These provisions will be held to cover designs and models as well as discoveries and inventions, and their force will be retrospective.

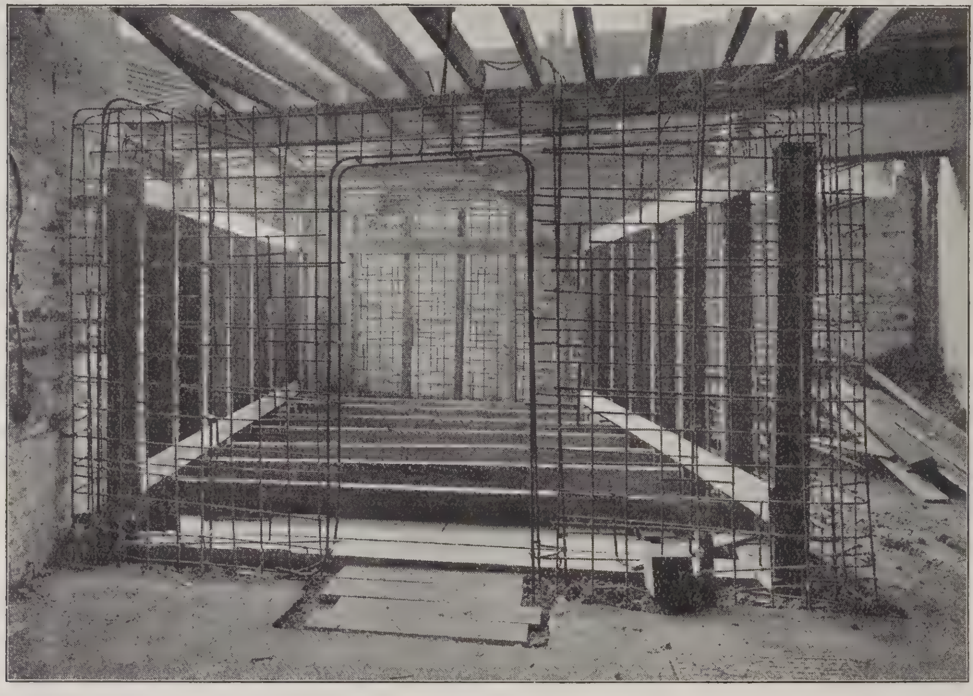


FIG. 9.—BANK STRONG ROOM IN LEEDS. SHOWING CHAIN CONCRETE REINFORCEMENT BEFORE THE CONCRETE WAS PLACED IN POSITION. CARBY, HALL AND DALBY, ARCHITECTS. (*See previous page*).

REINFORCED CONCRETE IN FOUNDATIONS.

By Vere Sussex Hyde.

Of the various forms of modern building, reinforced concrete may be styled the most versatile. It can, with success, be adapted to almost any kind of structure, and perhaps it may be shown to one of its best advantages in the construction of foundations, on particularly awkward and dangerous sites.

In a case where it would be necessary to construct very deep and wide foundations of the usual type, the use of reinforcement in concrete, by placing bars near the bottom surfaces, will considerably reduce the thickness of ordinary footings; consequently, on a very bad site, if reinforced concrete is used entirely, great economy may be exercised, and, apart from that, a reliable foundation can be built in a degree of certainty that would be lacking if it were built in the ordinary way.

Treatment of Marshy Sites.

Taking, for instance, a very marshy site, or a site that consists of made-up ground of, say, 20 ft. deep over the whole area on which it is proposed to erect a building. It will be found that a foundation constructed on the principle of a huge raft supported on reinforced concrete piles is most successful. By this method it is possible to distribute loads safely over the whole area. A fine example of this means of construction is nearing completion at the new Generating Station, Dundee, which has been carried out on the Coignet system. The accompanying photographs give an excellent idea of the method employed.

In building a foundation of this type, the piles are driven in groups according to the manner detailed on the plans and specification. When a sufficient number of piles have been driven, the work of building the raft can be commenced. The first thing that is done is to strip the heads of the piles down to the necessary levels, leaving the rods bare. Blocks or caps are formed in falsework, generally termed centering, around the heads of the groups of piles; then moulds for the principal beam and secondary beams are erected. The necessary reinforcement is placed in the cap and beam moulds. These are concreted, and thus whole beams, piles, and caps are made monolithic. The ground is then made up to the level of the underside of the slab. The reinforcement or armouring is laid and connected in the same manner as an ordinary floor slab. (See Fig. 1.)

Foundations for Heavy Loads.

For foundations subjected to heavy and vibrating loads, such as engines for electrical plant and for engine beds, blocks may be constructed in a similar fashion to those already referred to, supported on piles.

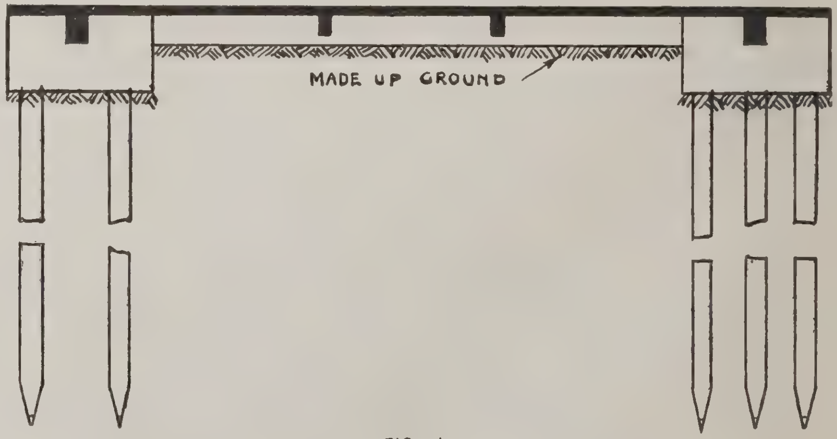


FIG. 1.

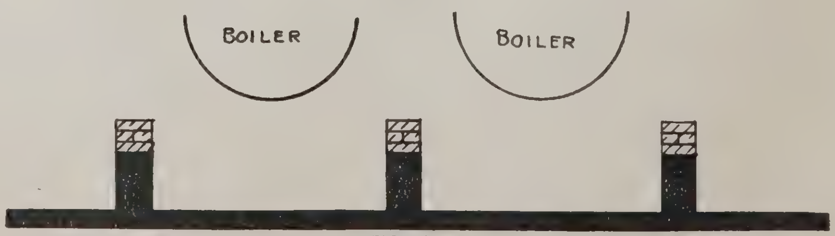


FIG. 2.

ILLUSTRATING REINFORCED CONCRETE IN FOUNDATIONS.

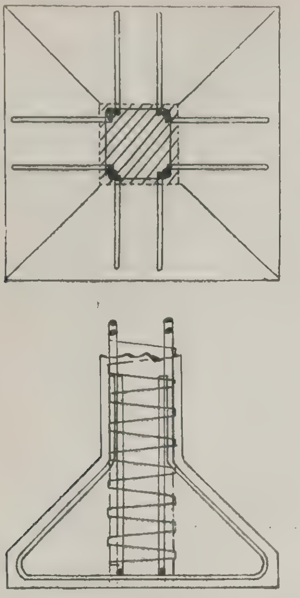


FIG. 3.

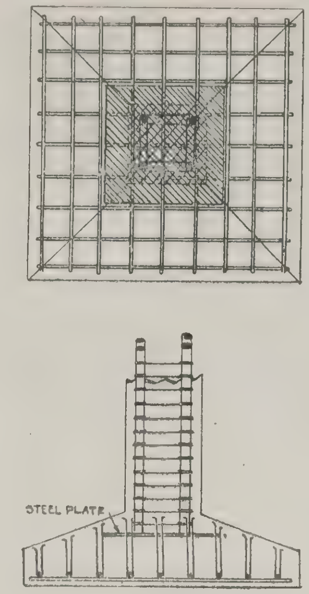
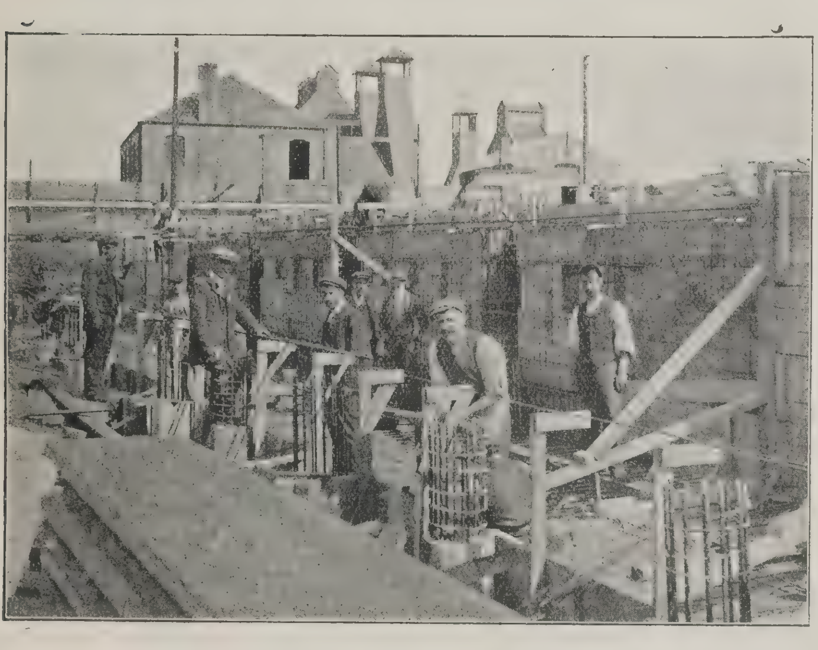
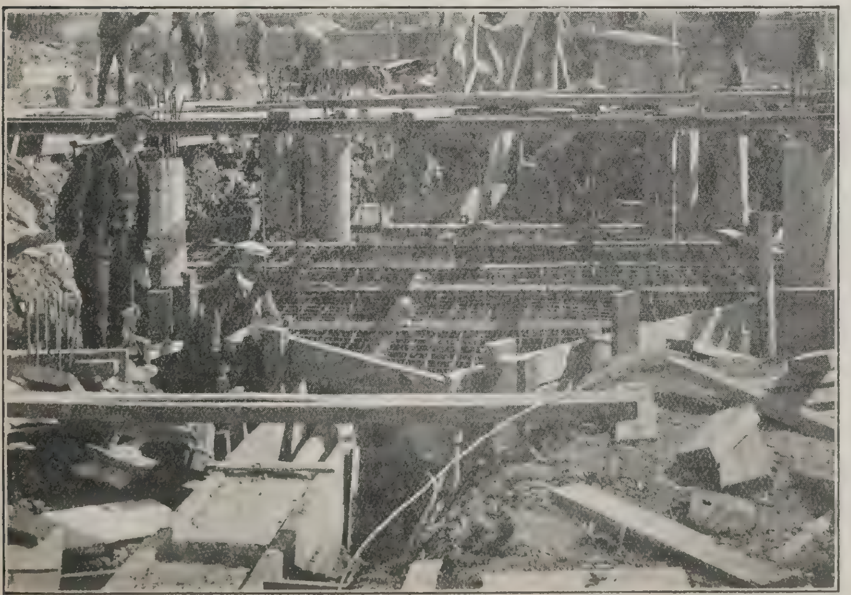


FIG. 4.

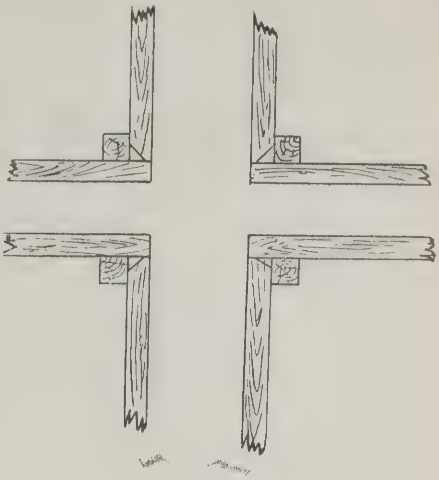


View showing piling and retaining wall of pipe track.



View showing block to support chimney shaft.

ILLUSTRATING "REINFORCED CONCRETE IN FOUNDATIONS."



PLAN

FIG. 5.

A very interesting example of the adaptability of armoured concrete for sustaining heavy loads may be found at Messrs. J. C. and J. Field and Son's new candle and soap factory at Rainham, in Essex. The work is the foundation for boilers on very marshy ground. It was constructed as an ordinary floor slab on beams, but inverted. By this means the reaction of the ground is withstood, and corresponds to an ordinary superload, spread over the whole area. (See Fig. 2.)

Footings for Posts and Walls.

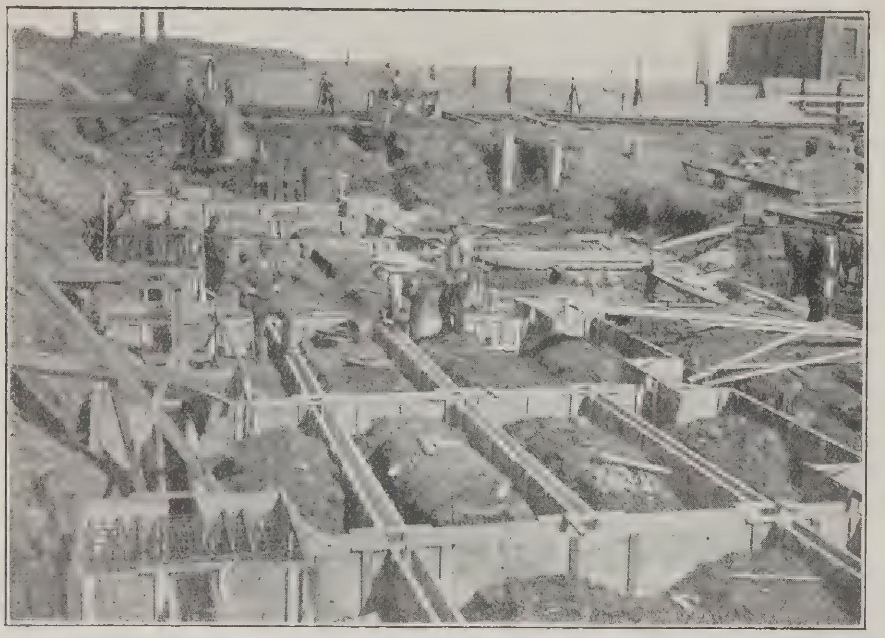
Footings for posts and walls are sometimes erected on the ground if sufficiently sound, but in a bad case, on piles. Figs. 3 and 4 illustrate two types of footings as advocated by two well-known systems; they sufficiently explain themselves, so it will not be necessary to give a detailed description of them.

Economy in the Falsework.

There is a good opportunity for an ingenious foreman to exercise considerable economy in the falsework, shuttering, or centering in foundation work. The ground can be made up and levelled to the under side of the beams and slabs, and so save placing bottom planking. This is an item of great consideration in an ordinary floor. No props are required, and other necessary means of support, unavoidable in floors or slabs above the ground level. Care must be exercised so that all beams are straight, rigid, and in their proper positions, and should be strutted from one another, so that they do not bulge during the process of concreting.

So that the beam moulds may be easily removed, it will be found a good practice to splay the ends of the sides of the moulds where they meet, as shown in Fig. 5.

A new road bridge, connecting the Berw side of the Toll river with the Cilfynydd side, has just been constructed of reinforced concrete on the Hennebique system, at a cost of £3,500 for the Pontypridd Urban District Council. It is the largest span bridge built of this material in Great Britain. The total length is about 170ft., with a uniform width of 30ft., and the main arch is 120ft. long. The two piers are carried on reinforced concrete pile foundations, driven to the rock, and the whole work has taken just over six months to complete. A few days ago the bridge was tested with a weight of nearly 40 tons. The centre deflected to the extent of from ⅛in. to 1-10in., and resumed its normal position immediately the weight was removed. The bridge was designed by Mr. P. R. A. Willoughby, surveyor to the Pontypridd Urban District Council (who has just accepted the position of Commissioner of Works for the Government of Jamaica), and the contract was placed with Messrs. Page and Co., Cardiff.



View of falsework of beams and blocks, showing reinforcement in blocks.

ILLUSTRATING "REINFORCED CONCRETE IN FOUNDATIONS." *(See previous page.)*

REPORTS ON TESTS AT BIRMINGHAM NEW TELEGRAPH STORES.

Ground Floor, Block "B."—Normal load, 3 cwts. per foot super; full load 4½ cwts per foot super; area tested 324 ft.; thickness of slab, 4 in.; clear span of beams, 23 ft. October 31st, 7 a.m., deflection indicator set, loading commenced. 5 p.m. same day, load of 24 tons 6 cwts. (1½ cwts. per ft. super) on, deflection 2/64th in. Load left on until November 2nd 6 a.m., then doubled—3 cwts. per ft., or total load of 48 tons 12 cwts. This load was on by 11.30 a.m., deflection 5/64th in. Doubled load remained on until 12.30 p.m., then further 1½ cwts. per ft. (24 tons 6 cwts.) added and on by 2.30 p.m., deflection 10/64th in., under full load of 4½ cwts. per ft. super. This load remained until Tuesday morning, November 3rd, no further deflection taking place. Load gradually taken off and normal position regained by 5 o'clock.

Second Floor, Block "B."—Normal load 2 cwts. per ft. super.; full load, 3 cwts. per ft. super.; area tested, 324 ft.; thickness of slab, 4½ in.; clear span of beams, 23 ft. November 2nd, 7 a.m., deflection indicator set, loading commenced, 11.15 a.m. same day normal load on, deflection under beam 13/128th in. Load left on until 12.30 p.m. same day, and additional 1 cwt. per ft. added, 3 cwts. on by 2.30 p.m. same day, deflection 13/64th in. 2.40 same day load removed, floor immediately commenced to regain normal position—reached by 4 p.m., there still being load of two tons on floor. Both floors examined afterwards, no sign of any cracks, etc., whatever.

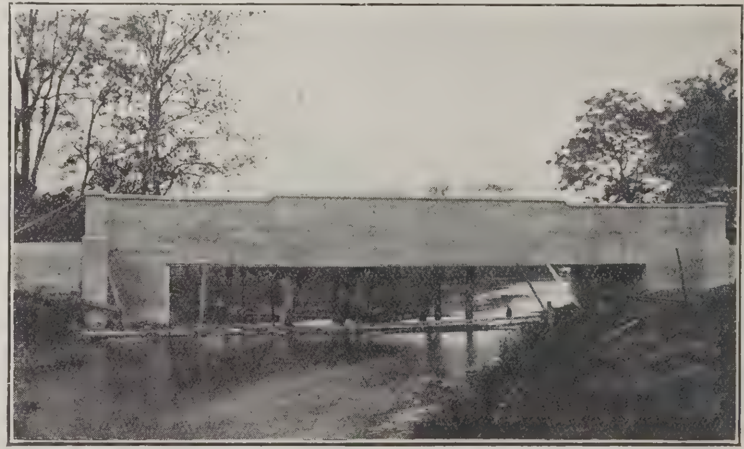
Reinforced concrete work carried out by Cubitt Concrete Construction Company. Reinforcement, Kahn Trussed Bars. Building consists of four floors and roof, and is 202 ft. 7 in. long, 65 ft. wide at greatest width, and 60 ft. high. Ground floor designed for superimposed load of 336 lbs. per ft. super. First and second floors 224 lbs. per ft. super. Decking of ground floor, 5½ in. and 4⅜ in. thick. Main beams, 23 ft. clear span, 24 in. total depth. Entire skeleton of building, viz., columns, beams, decking, etc., erected in reinforced concrete. Facing of brick and stonework carried at each floor level on reinforced concrete beams. Wall practically erected in panels and entirely carried by framework. Walls do not carry any of floor loads.

Note.—This building is a replica of Block "A" constructed by this company, only designed to carry lighter loads.

The test was carried out on November 2nd, 1908.

The general designs are by Mr. J. Rutherford, H.M. Office of Works.

A REINFORCED CONCRETE BRIDGE IN KENT.



REINFORCED CONCRETE BRIDGE OVER THE RIVER STOUR AT CHILHAM, KENT.

Messrs. D. G. Somerville and Co., the well-known specialists in reinforced concrete, have just completed for the East Ashford Urban District a reinforced concrete bridge.

This bridge, of which an illustration is shown, spans the River Stour at Chilham: the span which for a flat girder type is considerable, is 47ft. in the clear, the width of roadway being 15ft. The abutments, which also form retaining walls, are carried down to a solid bottom 10ft. below the surface of the roadway. The main girders are carried up to form the side parapets, and are finished with an ornamental moulded coping. The roadway is carried on a 5in. thick reinforced concrete deck supported on intermediate beams.

The bridge was successfully tested a few days ago in the presence of Mr. H. P. Maybury, the county surveyor, the test consisting of two 12-ton traction engines connected together and run over at five miles an hour. A feature of the construction was the rapidity with which Messrs. D. G. Somerville and Co. carried out the work, only taking six working days from time of completing the necessary excavation for the foundations, the system of reinforcing being that of the Kahn bar.

BLOCK "B." BIRMINGHAM TELEGRAPH STORES. VIEW OF FLOOR TEST

Cubitt Concrete Construction Co.

In order to facilitate the working of the Patents Act, the London Chamber of Commerce is arranging the formation of a central committee or association.

* * *

A miniature rifle range has been constructed on the roof of the new Victoria Railway Station Buildings, Manchester, by the Lancashire and Yorkshire Railway Company, for the use of their employees.

Notes and News.

The sale of Queen's Road (Bayswater) baths and washhouse, and the site they cover, by Paddington Borough Council has been negotiated, Messrs. William Whiteley, Ltd., having agreed to purchase for £60,000, provided the consent of the Local Government Board can be obtained.

* * *

By a Bill now being promoted by the London County Council, it is proposed to spend £1,090,000 for the extension of tramways in London. The Bill deals with the construction of new lines in Paddington, Clerkenwell, Finsbury, Shoreditch, Islington, Hackney, Battersea, Putney, Wandsworth, Deptford, Greenwich, Woolwich, and Highgate, and includes provisions for the purchase of the Highgate Hill Tramways. Of the amount proposed to be expended, £638,500 is for the construction and equipment of new tramways, the reconstruction of existing tramways, and the purchase of land; while £451,000 is set apart for new streets, street improvements, widenings work, and land purchase. The Shoreditch Borough Council has petitioned against the Bill, which will be considered on February 17th.

* * *

The site of the Franco-British Exhibition at Shepherd's Bush is to be utilised this year for an Imperial International Exhibition, which will open in May. The exhibition will be run on the same lines as last year, but will be open to the products of all countries. The old palaces, re-decorated, will be available for housing the exhibits.

* * *

Lockwood's Price Book.—The term "Price Book" has been long considerably outgrown, and "Lockwood" contains not only every building-trade item to which a price can be attached, but also many other features that do not admit of this qualification for inclusion—such as, for example, the lists of surveyors, the notes on legal decisions, the full texts of several Acts of Parliament affecting buildings, and a number of useful tables and other memoranda. The volume is, in fact, a builders' year-book, as complete and comprehensive as could be desired. The editor, Mr. Francis T. W. Miller, A.R.I.B.A., has been, as usual, assisted in the legal department by Mr. A. J. David, LL.M. Messrs. Crosby, Lockwood and Son, 7, Stationers' Hall Court, Ludgate Hill, E.C., and 121a, Victoria Street, Westminster, are the publishers, and the price is 4s.

* * *

A silver and ebony altar cross has been placed in Croyland Abbey, to the late Rector of Croyland, the Rev. T. H. Le Bœuf, who had a fatal seizure whilst conducting service in the abbey. The altar cross bears the inscription round the base: "To God and His Church, in memory of Thomas Henry Le Bœuf, priest, and sometime rector of Croyland. R.I.P." The late rector did a very important work in connection with the restoration of the famous abbey, and wrote some thousands of letters, which resulted in a large sum being realised and expended in the restoration of the fabric.

* * *

A "skyscraper church," or combination church and business building, has been designed for Pittsburg, Mass., by Mr. Eugene C. F. Ernst. The building is to consist of three 80-ft. sections. The two outside sections will contain shops and offices, while the middle section will contain the church, with more offices above. An assembly hall, 240ft. by 110ft., will be found on the fourteenth floor. A clock with a 10-ft. face, will be placed on the sixth storey, and above it there will be set of chimes. The estimated cost is £400,000.

* * *

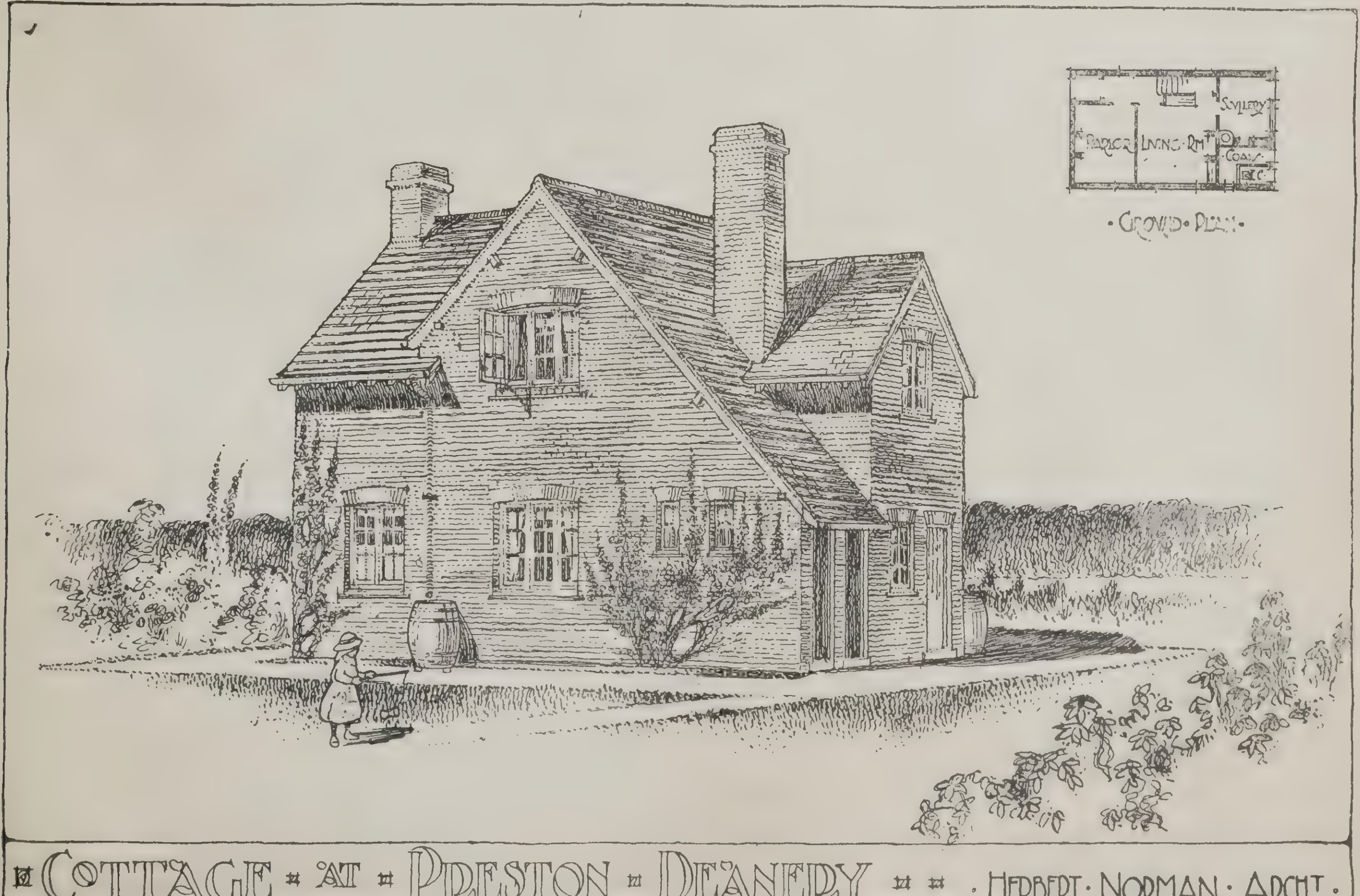
The directors of the First Garden City, Limited, in their report for the past year, state that four new factories and several workshops have been established, or sites have been taken for them, and 134 new buildings have been erected or commenced. A sum of £18,987 has been expended on capital account during the past year, and a further sum of £10,000 could very advantageously be applied forthwith, and further capital before the end of the year.

* * *

The members of the Shakespeare Memorial Executive Committee met on Thursday evening, at the Mansion House, under the presidency of the Lord Mayor. The reports of the two sub-committees appointed to examine the proposal for a national theatre and a scheme for making a public appeal for funds were considered and approved. Some other matters in regard to the movement were adjourned. The scheme for the erection of a national theatre as a Shakespeare Memorial is, therefore, approved, but the proposal will come up for final consideration at a future meeting of the general body.

* * *

The Borough engineer of Camberwell, in his report on the recent snowfall, remarks that it was the heaviest experienced in the borough for twenty-eight years. The total expenditure incurred there in the clearance of snow was £2,492. The previous fall, in 1906-7, cost the ratepayers £1,931. The Council is responsible for 117½ miles of roads, with 235 miles of footways. The engineer is of opinion that no better facilities for disposal of snow are available in Camberwell than the sewers afford, provided a sufficient supply of water is running therein to secure that the loads of snow when shot are swept away immediately by the current. This was the first occasion that snow had been treated in this way, and the experiment has resulted in a saving of time, labour, and "barging." Each sewer has since been examined, but no evidence of injurious effects was found. The Works Committee has passed a resolution expressing appreciation of the efficient manner in which the Borough engineer and his staff dealt with the emergency.



COTTAGE AT PRESTON DEANERY. HERBERT NORMAN, ARCHT.

This cottage is built with local-made bricks and has a slate roof, the object being to get, at a low figure, a pleasing grouping by means of the broken roof and chimneys. The builder was Mr. Henry Martin.

The beautification of Cardiff is going on. Lord Tredegar's agent having been approached with respect to the development of land on the Penylan side of the Cardiff railway, it was intimated that Lord Tredegar was willing that the streets should be 70ft. wide instead of 50ft., if the corporation would agree to 10ft. on each side being reserved for the planting of trees and shrubs. The committee agreed to the proposal, which they thought very generous, as well as conducive to the health and beauty of the locality.

* * *

A subway for the Elephant and Castle, Southwark, was advocated at a public meeting at which the Mayor presided. It was explained that the idea originated with a Bill promoted by the Baker Street and Waterloo Railway Company, who proposed to construct a station near there. The company had, however, after obtaining the powers, found it undesirable to construct that station, and had paid the borough council £6,000 towards the cost of constructing the subway. In the London County Council Bill the estimated cost of the work was £17,000. Towards that expenditure the borough council had in hand £6,086, and a further £3,000 would be contributed by the London County Council. The balance would have to be made up by loan. The resolution in favour of the project was carried unanimously. The town clerk of Southwark explained that the three subways would run:—(1) From the southern corner of St. George's Road to the eastern side of Newington Causeway; (2) from the eastern side of Newington Butts to the western side of Newington Causeway; (3) from the northern side of St. George's Road, and effecting a junction underground with the second section. The entrance in all cases will be on the footway principle.

* * *

At the annual meeting of the Garden City Association, which was held at Birkbeck Bank Chambers, London, on January 27th, Mr. Justice Neville, the president, claimed that the association had brought about a great change in the minds of the public in regard to the laying out of estates, and generally with regard to the housing of the working classes. As the result of their teaching, he declared, tenants were more exigent about the amount of space required in the rooms of their houses, and builders no longer attempted to put off upon the public the kind of buildings that used to be thought good enough. Mr. Edward Moon mentioned the suburb schemes at Warrington and Bristol, the village being formed on Holderness Road, Hull, largely through the endeavours of Sir James Reckitt, for the benefit of the employees at Messrs. Reckitt's works, and the model mining village of Woodlands, near Doncaster, where the Brodsworth Colliery Company had made an advance over anything hitherto attempted. More villages on similar lines were being projected by colliery owners in various parts. Dr. R. O. Moon submitted the balance-sheet, which showed a deficit of £150, the subscriptions for the year having fallen off by £60. Mr. Justice Neville was re-elected president.

* * *

The County Councils Association has decided to hold in London on April 29th and two following days a conference on roads. Among the public bodies which have already appointed delegates are many English, Scotch, and Irish county councils, the Association of Municipal Corporations, the Urban and Rural District Councils Association, the Convention of Royal Burghs, the Association of Municipal and County Engineers, the County Surveyors' Association, the Institution of Municipal Engineers, the Institution of Mechanical Engineers, the Central Chambers of Agriculture, the Royal Automobile Club, the Scottish Automobile Club, the Yorkshire Automobile Club, the Roads Improvement Association, and the Motor Union. The delegates appointed include the Marquis of Winchester, the Marquis of Breadalbane, the Marquis of Bute, Lord Valentia, Lord Montagu of Beaulieu, Sir W. H. Browne-Ffolkes, Sir W. Chance, Colonel C. Crompton, Admiral Hart-Dyke, Mr. C. D. Rose, M.P., and a large number of county and borough surveyors.

* * *

The excavations during the past year at the site of the Roman city of Corstopitum (Corbridge-on-Tyne) are described in the annual report of the Newcastle Society of Antiquaries, in which it is stated that the results more than realised anticipations of the nature and character of this buried city. This centre disclosed in the granaries, and in the massive masonry adjacent, a series of buildings in keeping with the magnitude of a large town. A piece of folded lead was discovered, which, on being opened, was found to contain a gold ring and forty-eight gold coins. These ranged in date from the reign of Valentinian (A.D. 364 to 375) to that of Magnus Maximus (A.D. 383 to 388). Many detached Roman camps were observed, which suggested new problems in relation to the successive military operations during the subjugation of these parts by the legionaries.

Law Case.

Storage Reservoir a Building.

In the very useful digest of law cases that is published weekly in the "Standard," the following case is summarised: "A covered storage reservoir, with concrete floor and walls of brickwork, backed by concrete and earth, covered in by brick arches supported by piers, the arches being covered with concrete and earth, and of a cubical extent exceeding the statutory maximum of a building structure under the London Building Act, 1894, is a building within the Act, and is subject to its provisions, including the supervision of the district surveyor, notwithstanding that it has been constructed under the powers of special Acts of Parliament. So held on January 19th by the Divisional Court in a case stated by a metropolitan police magistrate. "Venner v. McDonell" ([1897] 1 Q.B., 421); "London County Council v. City and South London Railway Company" ([1891] 2 Q.B., 531); "Surrey Commercial Dock v. Bermondsey Borough" (73 L.J., K.B., 293; [1904] 1 K.B., 474) distinguished.—MORAN AND SON v. MARSLAND.

Correspondence.

A Rod of Brickwork.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—A correspondent in "Notes and Queries" for Nov. 14th last asked—When the rod, which he assumed to be a land measure, was first used for brickwork? and the following week, in the BUILDERS' JOURNAL, the retort courteous was made that possibly things might be reversed, and the question put—When was the rod as a brick measure adapted to land?

Referring to this, a correspondent makes the following interesting observations:—

"The origin of the rod, pole, or perch as a lineal and superficial measure has been traced to the rod, pole, or goad used to urge and direct a team of oxen pulling a plough. So it came about it was used as a convenient and handy land measure in feudal times by the lords in allotting plots of land for agricultural purposes to the villans and others. One rod wide and forty long (i.e., one "furrow-long" deep) built up a quarter of an acre. The furlong—or four poles wide, and the same depth, i.e., 40 poles, one acre—was a convenient length for a furrow before turning the plough. Of course, these lengths somewhat varied in different parts of the country where soils and agriculture varied, but gradually the slight variations grew less, and finally the present accepted statutory acre was evolved. Gunter's chain of 66 ft. (ten square chains to the acre) was invented by the Rev. Edmund Gunter (1581-1626). He was a professor of astronomy at Gresham College, London, and ingenuously adapted it to facilitate decimal calculations in land measurements.

"The use of the rod—in superficial measurements of brickwork—and lineally in hedges, ditches, and fences, followed as a convenient existing measure. A square rod is 272¼ superficial feet. There was an old Winchester corn gallon (enacted in 1712) of 272¼ cubic inches, but this was not derived from the superficial rod. The old Winchester bushel was 2,150.42 cubic inches—omit the fraction, add one Winchester wine pint—said to have been added as an allowance for waste in grinding—28 cubic inches (also omitting fractions), and we get 2,178 cubic inches—divide by eight for gallons, and 272¼ is the result."

An old authority gives the length of the original rod—the ox-goad—as varying from 16ft. to 20ft.

From the above it would appear the rod was originally a land measure.—Yours truly,

Exeter. HARRY HEMS.

Obituary.

The death is announced of Mr. Robert Henry Boyce, of Hampton Wick, late Principal Surveyor in his Majesty's Office of Works. Mr. Boyce was born in February, 1834, and received a scientific education, on the completion of which he entered the Civil Branch of the Royal Engineers. A few years later he was selected to proceed to China in connection with the fortification of various British settlements. This occupied him for some years, and he was then appointed to design and superintend the erection of various Diplomatic and Consular buildings in the East. He afterwards joined the Office of Works, from which he retired some seven years ago. In recognition of his services he received the Companionship of Bath. Just before his retirement Mr. Boyce built at Hampton Wick a house which was in many ways a remarkable type of architecture, combining many of the features which its owner had noted during his travels, and was so constructed that even extreme variations of external temperature scarcely affected its inhabitants.

Mr. James Neale, F.R.I.B.A., F.S.A., who died on January 18th, at 10, Bloomsbury Square, W.C., in his fifty-ninth year, was the architect of many residences in Hampstead and elsewhere. He also laid out the New Malden Station Estate, in Surrey. He was the author of an excellent architectural monograph on St. Albans. He was the R.I.B.A. Pugin Student in 1875, and Institute Medallist (Drawings) in 1876. He was elected Associate in 1875, and Fellow in 1890.

Mr. Walter Hill.—The death occurred at Hever, Edenbridge, Kent, on Sunday evening, January 17th, of Mr. Walter Hill, of Peterborough, one of the members of the firm of John Thompson and Co., church builders and restorers. Mr. Hill, who was in his 61st year, had for more than forty years taken a great part in cathedral and other restoration work in all parts of the kingdom; the new tower and spire of the American church in Paris was also built under his direction. He first became associated with the late Mr. John Thompson in 1865. He took part in the erection of the Royal College of Music, the Church House at Westminster, and the Royal Holloway College, Egham, and also superintended the additions to the King's and Queen's apartments at Sandringham. He was also employed in the restoration of Canterbury, Hereford, Ripon, Chester, Salisbury, Llandaff, Winchester, Peterborough, Lichfield, Lincoln, Rochester, and Bangor Cathedrals. At the death of Mr. John Thompson he became a partner in the firm.

Architectural Societies.

Glasgow Institute of Architects.

The triennial competition, open to Britain, for the Alexander Thomson Memorial Studentship, value £60, under the management of the Council of the Glasgow Institute of Architects, as trustees, has this year resulted in favour of Mr. David Robertson, a second prize of £20 being awarded to Mr. Alexander Thomson Scott. The object of the contest is to select a student for furtherance of his studies by giving him acquaintance at first hand with Classical architecture, of which the late Mr. Thomson, in whose memory the studentship is instituted, was a warm admirer, and practised very successfully, as many Glasgow works testify. Drawings are required from the competitors as evidence of study in books, and from buildings by sketch and measurement, and besides these an original design is required: the subject this time being a city church with halls and manse. Five sets were submitted, and of four the standard reached is stated to be higher than on any previous occasion, especially in the matter of excellent draughtsmanship. The winner is in the office of Messrs. Stewart and Paterson, and the second prizeman is with Messrs. Campbell Douglas and A. N. Paterson, and both are students of the Glasgow School of Architecture, another of whose students, Mr. R. W. M. Gunn (as reported in our issue of January 20th) gained the R.I.B.A. "Tite" prize for architectural design.

Leeds and Yorkshire Architectural Society.

Mr. H. Phillips Fletcher, F.R.I.B.A., in the course of a paper on "Georgian Domestic Architecture," read before the Leeds and Yorkshire Architectural Society on January 14th, explained that Georgian architecture the style principally in vogue in the 18th century, was the English expression of the great Renaissance movement. He traced the influence of Inigo Jones, and the effects of his visits to Italy in the middle of the 17th century. He also pointed out how Wren nurtured the style with his borrowings from the architecture of the Netherlands, producing buildings so peculiar to this period. The lecturer attributed the decay of Georgian work to the age of the succession of revivals, and pointed out its reintroduction some twenty years ago under the name of Queen Anne. A house in the close at Salisbury was taken as typical of the smaller house, and the well-proportioned sash windows and stout wooden bars were noted, the most prominent feature being, perhaps, the central doorway, with its consoles and the boldly projecting consoled cornice. The lecturer then analysed the characteristic features of the style, and remarked that Wren popularized red brick walls; although in suitable districts stone was much employed. The Swan House in Chichester was quoted as a good example of rubbed brickwork with the employment of raised blocks at the angles. A doorway at West Wycombe was taken as being a simple and satisfactory example in which fluted pilasters and a simple cornice were used. It was pointed out that the doorways of the period were finely executed in wood, and formed a strong contrast to the Italian marble doorways of the same period. The doorway at Mr. Seymour Lucas's house, with its typical shell hood, was also shown on the screen. The windows of the sash type set flush with the wall were taken as being typical of the style, and it was noted that such windows were considerably smaller than those of the Jacobean period. The introduction of external shutters from Italy was also borne in mind, and their effect upon the scale and appearance of the buildings was also considered. It was pointed out that the cornices projected boldly and formed special features, and it was also shown that they were frequently of wood, and often carried right round the house. The method of roofing was then dealt with, and that at Tyttenhanger, Herts, was taken as being characteristic. The effect of its reposeful skyline, and the dignity and unity of design, were contrasted with the numerous gables so frequent in many modern houses. The feature that Georgian architects made of chimney stacks, and their symmetrical grouping, was also dwelt upon.

The lecturer then dealt with the treatment of internal work. Commencing with the walls, he pointed out the frequent division of the same into three—namely, the low dado, the large panel, and the cornice which gave a certain breadth to the whole, which was sometimes wanting in Jacobean work. The framing of the doorway in one of the classical orders was also noticed. Examples of the rich treatment of the fireplaces were also placed upon the screen.

The lecturer also decribed the bold and effective Georgian staircases, and the geometrical treatment of the ceilings.

Mr. Fletcher then dealt with the grouping of smaller houses together, which produced such fine designs, and took the terraced houses at Stamford as characteristic of the style. He then showed an example of another house in Salisbury Close, showing the plain simple treatment for a detached town house.

Eltham House, Kent, was treated as a good example of the simple block plan for a country house, and Groombridge Place, Kent, was shown with its H-shaped plan.

Houses having a centre block with wings were then dealt with, and many slides of Stoke Park, Northants; Blenheim Palace, and other buildings, were shown upon the screen. The town mansion was then dealt with, and Marlborough House, London, and Kensington Palace were shown.

In conclusion, Mr. Fletcher pointed out the appropriateness of the different buildings to their special requirements, and the homely comfort of the smaller buildings contrasting with the stateliness and grandeur of the large buildings. He also noted the tendency in certain directions towards simplicity in design at the present time, and hoped that the study of Georgian architecture would assist in this direction. He specially pointed out that the *motif* of much of the Georgian work was suitable for houses of the present day. He thought that the successful results of the period were due to a very large extent to the very extensive and diverse attainments of so many of the Georgian architects which gave them the facility for grasping at once the measures that in each individual case would be appropriate. He considered that the versatility and refinement in Georgian design was due largely to liberal education of the architects, who did not confine themselves to the study of their profession alone, but of whom many were, in addition, skilled mathematicians, astronomers, dramatists, and even, so it is rumoured, not indifferent performers with the rapier. The lecturer thanked his brother, Mr. Banister Fletcher, for having placed his collection of slides at his disposal, and he mentioned that this collection contains more than 7,000 slides, a very large number of which were made from photographs specially taken in various parts of the world by Mr. Banister Fletcher.

Sheffield Society of Architects.

At the monthly meeting of the Sheffield Society of Architects and Surveyors, held at the University, Mr. J. R. Wigfull, A.R.I.B.A., described a visit paid to Rouen, Caudibec, and St. Wandrille. He gave a graphic description of the magnificent cathedral at Rouen, and also had a few words to say about the various parish churches of the city, including those of St. Ouen and St. Maclou. Afterwards he took his audience to the picturesque little town of Caudibec, where there is a fine church of the 15th century, containing a tablet to the master mason, who, for 30 years. directed the work The church and the quaint streets of the town were spoken of, and, in conclusion, Mr. Wigfull dealt with the Abbey of St. Wandrille, mentioning its connection in early times with the churches of Sheffield and Ecclesfield. The great tithes of Sheffield went to the monks of St. Wandrille, and Ecclesfield was a priory of the Abbey until the time of Richard II., when the alien priories were confiscated. The lecture was illustrated by slides made from photographs taken by Mr. Wigfull. At the close there was a discussion in which the President, Mr. Gibbs, Mr. Hall, and Mr. Mitchell-Withers took part.

Architectural Association.

At the ordinary general meeting, held on January 22nd, it was announced that the following gentlemen were unanimously elected:—E. L. Apperly, Lancaster Gate, W.; O. Newbold, Beckenham; H. Boyd-Walker, Rosario, Argentina; C. J. Newberry, Adelphi,, W.C.; B. H. B. Symons-Jeune, Henley-on-Thames; T. H. Chalkley, Bermondsey, S.E.; A. C. Newman, Chiswick, W. ; J. B. L. Tolhurst, Beckenham, Kent; A. Thorpe, Hampstead, N.W.

Views and Reviews.

Calendars, Year Books, and Diaries.

It is not yet too late to notice a batch of annual publications, the receipt of which, from want of space, we have been hitherto prevented from acknowledging. A "tear-off" wall calendar from Messrs. Arthur L. Gibson and Company, 19-21, Tower Street, Upper St. Martin's Lane, W.C., is adorned with a very fine three-colour reproduction of E. Lamasure's painting, "A Country Road." "The Mill on the Floss," by A. Malcolm, an excellent "Rotary Photo" reproduction, adorns the wall calendar sent out by Messrs. W. Hall and Co., mahogany and timber merchants, of Hackney Road, N.E., and Rye Lane, Peckham, S.E. "The Year's Art, 1909," edited by Mr. A. C. R. Carter, and published by Hutchinson and Co., 34, Paternoster Row, is the thirtieth annual issue of a publication that not only reviews the past year's art (architecture being, of course, included), but describes succinctly the principal art institutions at home and abroad, and includes a valuable directory of artists and art workers. "The Mechanical World Pocket Diary and Year Book for 1909" (Emmott and Company, Ltd., 65, King Street, Manchester) contains a collection of useful engineering notes, rules, tables, and data, and is, without flattery, a wonderful sixpennyworth. The "Diary and Handbook of the London Master Builders' Association" (2s. 6d.: 31 and 32, Bedford Street, Strand) contains in handy form a great deal of information that is indispensable to building-trade employers, and that cannot be easily obtained elsewhere—such, for instance, as the list of members of the London Master Builders' Association, the "short history" of the association, and the summary of working rule agreements with the operatives. "Willing's Press Guide" (1s.: James Willing, jun., Ltd., 125, Strand, London, W.C.) is a concise and handy alphabetical list of the newspapers and periodicals issued in the United Kingdom, with the year of establishment, when published, price, and publisher's name and address, different classes of periodicals being conveniently indicated by distinctive type. The "Sanitary Record Year Book and Diary for 1909" (5, Fetter Lane, E.C.) has for its principal feature an excellent diary, interleaved with blotting paper, but it contains also a variety of useful information on sanitary matters, with a useful review of the sanitary legislation of 1908. The "Decorators' Diary and Trade Year Book, 1909," edited by Arthur Seymour Jennings (The Trade Papers Publishing Co., Ltd., 365, Birkbeck Bank Chambers, High Holborn, W.C.), includes an excellent interleaved diary, many valuable tables, and, for the first time, a "List of Prices for Painters' and Decorators' Work," for which it is claimed that it is the most complete list of the kind extant.

Federation News.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

The monthly meeting of the Leeds Association was held on January 12th, Mr. W. Irwin, president, in the chair. The president reported that the Highways Surveyor of the Leeds Corporation had intimated his willingness to fall in with the views of the Association that the payment of paving repairs should be based on measurement and not by time, the alteration to take place from January 1st, 1909.

A letter was received from the Buildere' Labourers alleging breach of working rules with respect to wages paid on a Corporation contract. As a result of considerable correspondence, information was ultimately divulged which showed that the matter had been the subject of previous correspondence between the operatives' society and the Corporation. It was ascertained that the town clerk had written to the society intimating that the Corporation Committee, after carefully considering the matter, had arrived at a decision that there was no breach of the Corporation's fair trade clause requirements. The members expressed themselves very strongly on the procedure adopted by the operatives of taking any dispute direct to the Corporation without first bringing it under the notice of the association. Ultimately a resolution was passed to the effect that the operatives having appealed to the Leeds Corporation, the members felt that they ought to be satisfied with the decision of the Corporation committee.

The president and Messrs. P. Rhodes and J. S. Myers were elected as representatives to the National General Meetings, with Mr. G. W. Wilson as reserve. Five firms were elected as the associate members of the association. Two small accounts were presented for consideration, and passed for payment.

NEWPORT (MON.) ASSOCIATION.

Secretary: R. Richards.

The annual meeting of the Newport (Mon.) Association was held on Monday, January 11th, Mr. A. W. Brownscombe, president, in the chair. After the usual business of the association had been dealt with, the election of officers for 1909 took place, the new president elected being Mr. W. Jewell, of the firm of Messrs. W. Jewell and Son, contractors; vice-president, Mr. John Charles, contractor, of the Shaftesbury Steam Joinery Works. Councillor Wm. Blackburn is re-elected hon. treasurer, Mr. George Martin and Mr. D. Nicholas are re-elected auditors, and Mr. Richard Richards was re-elected secretary for the ninth year in succession. The delegates to the National Federation meeting are the president, vice-presidents, and Mr. R. W. Moon. The delegates to the South Wales Federation are the president, vice-presidents, and Mr. A. W. Brownscombe. Delegate to the Ratepayers' Association, Mr. Albert W. Brownscombe. The following constitute the local Conciliation Board of the Building Trades as regards the Employers' Association:—Messrs. W. Jewell, John Charles, Councillor William Augustus Linton, Councilor W. M. Blackburn, William Moore, W. R. Pitt, J. Hubert Leadbeter, R. W. Moon, A. W. Brownscombe, A. S. Morgan, Richard Richards (secretary).

Upon the motion of Mr. John Charles, seconded by Mr. R. W. Moon, a vote of thanks was accorded to the officers, hon. treasurer, hon. auditors, etc., for their past services, and to Councillor W. M. Blackburn for the use of the Assembly Hall for the association meetings.

It is interesting to place on record that during the past season, at the suggestion of Mr. A. S. Morgan (a past president of the association), Mr. John Bain, F.R.I.B.A. (now the architect to the Monmouthshire County Council), kindly gave a lecture, illustrated by superb lantern slides, on "Later Renaissance Architecture in England." Councillor W. A. Linton has been approached with a view of his preparing and giving a lecture upon his recent visit to Rome and other Italian cities.

A useful handbook has been prepared and issued to the members of this association, for the use of members only, entitled "Schedule of Prices and Charges for Day Work and Jobbing Work Generally." It has been compiled by order of the association and edited by the secretary. A special committee, consisting of practical and experienced members of the association, have devoted many months in drawing up the schedule of prices, which has been so compiled in order to ensure uniformity of charges in the trade generally "for jobbing and day work" and work where no specific agreement has been entered into. This book was issued to members on January 1st, and will form the schedule of prices until further notice.

SOUTH SHIELDS.

Secretary J. G. Robertson.

The second annual whist drive and dance in connection with the South Shields Association was held in the Crown Assembly Rooms, South Shields, on January 13th. About 120 ladies and gentlemen were present. The whole of the arrangements were in the hands of a small special committee, at the head of which was Councillor J. T. Armstrong.

STROUD ASSOCIATION.

Secretary: A. T. Browning.

A meeting of Stroud Association was held on January 16th, to receive the balance-sheet for the past year, which was read and considered satisfactory.

The following officers were elected for the year: Mr. W. F. Drew (Chalford), president; W. F. Drew and A. T. Browning, joint treasurers; A. T. Browning, secretary.

Owing to the depression in trade, there has been no business of interest during the past year.

Trade and Craft.

"Modern Factory Construction."

Under this title Mr. W. H. Brown, M.S.A., etc., of Standard Buildings, Leeds, has issued a handsome booklet in which a system of factory construction that has been patented in all commercial countries is described and illustrated. In this system the floors and roofs are not solid, but tubular, and are thus, it is claimed, rendered warm, ventilated, sanitary, insulating, sound-proof, light, and strong. They are also proof against condensation cracks, and are constructed to carry a load of 17cwt. per foot super., with 10ft. clear spans. The non-weight carrying walls Mr. Brown constructs of reinforced brick, the outer portion being a brick on flat, the inner portion a brick on edge. This cavity wall is cheap and effective, is weather-proof, and gives efficient insulation against dampness and variations of temperature. Partition walls of reinforced brick have a lateral resistance equal to 2cwt. to the square foot, and will carry heavy fire doors and support machinery gear, etc. This system of construction has been adopted in this country and in India and the Colonies by some of the largest manufacturers, as well as by H.M. Prison Commissioners, and it is claimed that the cost is often one-half that of ordinary construction. The illustrations given in the booklet afford a very clear exposition of the system.

* * *

In the notice, on p. 66 of our issue of January 20th, of Messrs. Dennison Kett and Co., Ltd., 11, Queen Victoria Street, E.C., the style of the firm should have been rendered as here shown.

Coming Events.

Thursday, February 4.

LEICESTER AND LEICESTERSHIRE SOCIETY OF ARCHITECTS.—Mr. B. J. Fletcher, "Notes on Town Planning."

Friday, February 5.

ARCHITECTURAL ASSOCIATION.—Mr. H. T. Buckland, on "Schools."

Friday, February 12.

MANCHESTER SOCIETY OF ARCHITECTS.—Professor Beresford Pite, M.A., F.R.I.B.A., on "The Growth of Design and Craftsmanship in English Masonry and Woodwork," 6.30 p.m.

Monday, February 15.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. T. T. Rees, F.R.I.B.A., on "The Liability of Architects to Clients and Public."

Friday, February 19.

BIRMINGHAM ARCHITECTURAL ASSOCIATION. — Mr. Frank T. Baggalay, F.R.I.B.A., on "Roman Architecture."

Friday, Febaruary 19.

ARCHITECTURAL ASSOCIATION.—Mr. A. Needham Wilson, A.R.I.B.A., on "The Poets and Architecture," 7.30 p.m.

Wednesday, February 10.

EDINBURGH ARCHITECTURAL ASSOCIATION. — Mr. William Davidson on "Norfolk Church Rood Screens and their Paintings."

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. J. A. Gotch, F.R.I.B.A., on "The Elizabethan House, as Illustrated by Contemporary Architectural Drawings."

Monday, Ferbuary 8.

GLASGOW INSTITUTE OF ARCHITECTS.—Mr. J. Honeyman, R.S.A., on "Architectural Education: A Retrospect" and a Forecast."

Tuesday, February 9.

ARCHITECTURAL ASSOCIATION OF IRELAND.—Discussion: "Would the Establishment of a University Degree be Desirable?"

Thursday, February 11.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—Prof. C. H. Reilly, M.A., on "The Grand Manner in Architecture."

Thursday, February 18.

CONCRETE INSTITUTE.—General meeting. Mr. L. Serraillier, on "Certain Aspects of Reinforced Concrete."

New Companies.

JAMES ROBINSON AND SON (SHEFFIELD), LTD.—Registered January 1. Capital £7,500, to take over the business of manufacturers of and dealers in bricks and other articles carried on by Mrs. M. H. Armitage, Miss C. E. Robinson and Miss L. Robinson at the Park Brick Works, Duke Street, Park, Sheffield, as James Robinson.

BEWICK AND CO., LTD.—Registered with a capital of £4,000, to acquire the business carried on at 357 and 359, Deansgate, Manchester, as "Bewick and Co.," to adopt an agreement with J. Bewick and to carry on the business of builders' merchants, manufacturers' agents, ironmongers, estate agents, and universal providers. The first directors are: W. Corrie-Jones, J. Bewick, and G. R. Crowden. Registered office: 357, Deansgate, Manchester.

BRITISH MACADAM.—Registered December 22. Capital, £5,000. Dealers in paving materials, stone and granite merchants, etc. The Crescent, Gravesend.

HYDE BRICK AND TILE COMPANY.—Registered January 7, by Jordan and Sons, Limited, 116-117, Chancery Lane, W.C. Capital, £3,000. 1, Church Street, Cheltenham.

FESTINIOG GRANITE COMPANY.—Registered December 31. Capital, £7,500. To work the granite and other stone or minerals in a quarry and adjoining land at Blaenau Festiniog, formerly worked by D. G. Davies and the late J. Hughes, and recently by D. G. Davies and O. C. Jones. Blaenau Festiniog, Merioneth.

CRUMLIN BUILDING CO., LTD.—Registered December 30. Capital, £12,000. To acquire, deal with and turn to account any lands, buildings, heraditaments, and premises, to carry on business as builders, architects, surveyors, contractors, etc. The first directors are D. F. Pritchard, R. E. H. Dayson, J. J. Lewis, W. T. Morgan, M. Bennett, and E. Ryan. Registered by Jordan and Sons, Ltd., 116-117, Chancery Lane, W.C.

ACTON PATENT CONCRETE PARTITION CO. (1909), LTD.—Registered January 7. Capital, £1,500. 63, Cornhill, E.C.

FOXDALE SILICA AND GRANITE QUARRIES, LTD.—Registered January 7. Capital, £30,000. Suffolk House, Cannon Street, E.C.

ANGLO-NETHERLANDS CEMENT CO., LTD.—To adopt an agreement between Het Industriel en Mynbouw Syndicaat Barissan of the first part, C. Christophus Lau of the second part, and this company of the third part, and to carry on the business of manufacturers of and dealers in cement, lime, limestone, clay, artificial stone, whiting, sand, mortar, concrete, and building materials of all kinds, etc. The first directors to number not less than five nor more than seven are: M. W. Wiehe, K. F. Van Bylevelt, H. C. Rutten, F. J. Louis van Bylevelt, and W. Molenbrook. Registered December 29, by J. Westcott and Sons, 140, Strand, W.C. Capital, £20,000.

List of Official Appointments Vacant.

Assistant Engineer (Rangoon, Feb. 7).—Salary Rs. 600 per mensem, rising to Rs. 700; age between 27 and 40 years.—O. Gillanders and Co., agents to the Rangoon Municipality, 67, Cornhill, E.C.

Articled Pupil in Borough Engineer and Surveyor's Office) (Macclesfield, Feb. 6).—F. R. Oldfield, town clerk, Town Clerk's Office, Macclesfield.

Inspector of Nuisances and Inspector of Petroleum (Lewes, Feb. 11).—Salary £140 per annum. Age not to exceed 45 years.—M. S. Blaker, Town Clerk's Office, Lewes.

Junior Assistant Clerk (London, S.E., Feb. 18).—Salary £45 per annum, rising to £55.—E. Pitts Fenton, clerk, 283, Tooley Street, London, S.E.

Clerk and Solicitor to the Council (Erith, Feb. 15).—Salary £475 per annum, rising to £575.—C. H. Fry, clerk to the council, U.D.C. Offices, Erith.

Engineer (London, N.).—Salary £1 per week.—Master, Islington Workhouse, St. John's Road, Upper Holloway, N.

Surveyor (Tendring, Essex, Feb. 8).—Salary £200 per annum, rising to £250.—A. J. H. Ward, clerk, 42, Church Street, Harwich.

District Main Road Surveyor (Derby, Feb. 10). Salary £200 per annum, rising to £250. Age between 25 and 45 years.—S. J. Hughes-Hallett, clerk of the Derbyshire C.C., County Offices, Derby.

Surveyor-General of Highways (Isle of Man, Feb. 20).—Salary £200 per annum.—R. H. Cubbin, secretary to the board, Athol Street, Douglas, I. of M.

Engineering Assistant in County Surveyor's Office (Londonderry, Feb. 9).—Salary £90 per annum.—T. B. Adams, secretary, County Court House, Londonderry.

Draughtsman (Shoreditch, E.C., Feb. 8).—Salary £100 per annum, rising to £140. Age between 21 and 30.—H. M. Robinson, town clerk, Shoreditch Town Hall, E.C.

Surveyor and Sanitary Inspector (Wicksworth, Feb. 6).—Salary £90 per annum, rising to £100.—J. Gratton, solicitor and clerk, Town Hall, Wirksworth, Derbyshire.

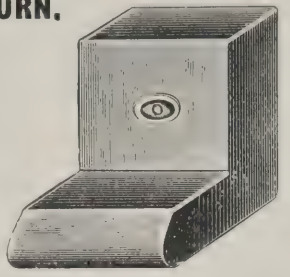
JAMES CHEW & Co.,
Brookhouse Brass and Copper Works,
BLACKBURN.

Copper Cylinders and Boilers and Pans of every description.

Sanitary Brass work.

Copper Cylinders for any pressure.

CopperBoilersfor every class of range.



Galvanised Cisterns
Roofs and Turrets covered with Copper.

LIFTS, CRANES, CRABS
REVOLVING SHUTTERS,
COLLAPSIBLE GATES,
SLIDING PARTITIONS.
DENNISON, KETT & Co., Ltd.,
II, Queen Victoria Street, LONDON, E.C.
Iron Staircases, Doors and Sashes.
CATALOGUE FREE ON APPLICATION.
Telegrams: "Hoisters, London." Telephone, Bank 8356. A B C Code.

Practical Notes for Architectural Draughtsmen.

By ALFRED W. S. CROSS, M.A., F.R.I.B.A.,
and ALAN E. MUNBY, M.A., A.R.I.B.A.

Complete Set Now Ready (27 Large Plates in a Portfolio), 12s.
POST FREE, 12s. 6d.

Prof. C. H. REILLY, of Liverpool University, says: "I think it is a very valuable book, and I hope it will find its way into most architectural offices."

THE "PRACTICAL NOTES" gives in most convenient form for use on the drawing board examples with concise rules, explanations and dimensions for preparing Designs, Perspectives and Working Drawings for Classical Architecture with rapidity and precision.

STUDENTS preparing for the examinations of the R.I.B.A. can learn how to draw The Orders correctly with the smallest possible amount of study and work by utilising the invaluable drawings and data given in this publication.

THE MANAGER, TECHNICAL JOURNALS, LTD.,
Caxton House, Westminster, S.W.
Descriptive Leaflet sent Post Free upon Application.

LAUNDRY
and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE.
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

FOLDING PARTITIONS. Hartley Bros., 2/- ft. Super.
REVOLVING SHUTTERS. 1/- ft. Super. GORTON, MANCHESTER.

The "Centenary" Petrol Gas Turbine Generator,
For Supply to a City or a Cottage.
THE CENTENARY GAS CO. (Dept. E), 11, QUEEN VICTORIA ST., LONDON, E.C., & 109, Hope St., Glasgow.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

*This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till **5** o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Berkhamsted.—For erecting new elementary school for fifty-six children at Whelpley Hill, Ashley Green, for the Bucks County Educational Committee. Mr. C. H. Riley, Architect, Education Office, Aylesbury :—

	£	s.	d.
J. Honour and Sons	£710	0	0
G. Parsons	698	0	0
G. Darlington	689	10	0
Webster and Cannon	668	0	0
J. Mead	639	0	0
F. G. Rust,* Chesham	639	0	0

* Chosen by ballot.

Dunmow (Essex).—Accepted for excavations, concrete foundations, and sundry walls, etc., in connection with corrugated-iron buildings. Also for the iron buildings of a bacon factory, to be erected at Dunmow, for the Dunmow Flitch Bacon Co., Ltd. Messrs. W. Douglas and Sons, Ltd., engineers :—Nicholds and Reynolds, King's Court, Broadway, Westminster, S.W., £2,996.

London.—For erecting 112 cottages on the third part of section C of the Totterdown Fields estate, Tooting, for the L.C.C. :—

	£	s.	d.
Leslie and Co., Ltd., Kensington	£31,372	0	0
F. and H. F. Higgs, Herne Hill	29,752	0	0
F. W. Fletcher, Tooting ...	28,745	0	0
W. Akers and Co., Ltd., South Norwood	27,269	0	0
C. Wall, Ltd., Lloyd's Avenue, E.C.	26,885	0	0
F. and T. Thorne, Isle of Dogs	25,943	0	0
J. Smith and Son, Ltd., South Norwood	25,517	0	0
A. Roberts and Co., Ltd., Earl's Court	25,028	5	0
G. E. Wallis and Sons, Ltd., Westminster	24,990	0	0
Gathercole Bros., Norbury ...	24,891	0	0
G. H. Carter, Tottenham ...	24,383	0	0
Rowley Bros.,* Tottenham ...	22,130	0	0

Architect's estimate, £26,300.
*Recommended for acceptance.

Erith (Kent).—For the following works for the Erith Urban District Council :—(1) Erection of building for laundry and disinfecting chamber at the Erith Sanatorium, Little Heath, Belvedere; (2) extension of workshop at tramcar sheds building, Walnut Tree Road, Erith :—

Contract No. 1.

	£	s.	d.
F. Finnery	£554	18	1
Thomas and Edge, Woolwich ...	528	0	0
J. F. Jarvis and Sons	480	8	0
H. E. Chandler, Belvedere ...	453	10	0
Friday and Ling	449	0	0
Hyde and Co., Norwood ...	394	0	0
G. H. Gunning and Sons* ...	399	17	6

Surveyor's estimate, £501 12s. 5d.

Contract No. 2.

	£	s.	d.
F. Finnery	£539	2	0
Thomas and Edge, Woolwich	535	0	0
H. E. Chandler, Belvedere ...	477	10	0
J. F. Jarvis and Sons	467	16	0
Friday and Ling	444	0	0
Hyde and Co., Norwood	419	0	0
G. H. Gunning and Sons* ...	393	0	0

Surveyor's estimate, £507 4s. 1d.
Rest of Erith.
*Accepted

Fishponds (Bristol).—For the proposed extension of All Saints' Church, Fishponds, Bristol. Messrs. Lingen, Barker, Son and Ellis, architects :—

	£	s.	d.
W. Cowlin and Son	£3,101	0	0
J. Browning, Fishponds ...	2,654	11	6
J. Perkins and Son	2,638	0	0
W. Preece, Filton	2,610	0	0
Adams and Jeffries, Oldland	2,604	0	0
Forse and Son	2,596	0	0
Ridd and Son	2,524	0	0
T. C. Gluyas, Bedminster ...	2,480	0	0
Marsh and Stone, Bedminster	2,460	0	0
E. Walters and Sons	2,385	0	0
E. Love	2,375	0	0
Hayes and Son	2,371	0	0
E. Clark and Sons, Fishponds*	2,255	0	0

*Provisionally accepted.

London, S.E.—For repairs, etc., at the North Lambeth Library, for the Lambeth Borough Council :—

	£
Hall, Beddall and Co., Waterloo Bridge, S.E.	£776
J. Parsons, 190-192, Waterloo Road, S.E.	553
Lapthorne and Co., High Street, Lambeth	548
Hibberd Bros.,* 140, Vauxhall Walk ...	543

*Recommended for acceptance.

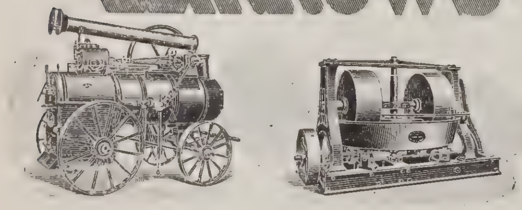
(*Tenders continued on page viii.*)

TELEGRAPHIC ADDRESS;
"BARROWS ENGINEERS, BANBURY"

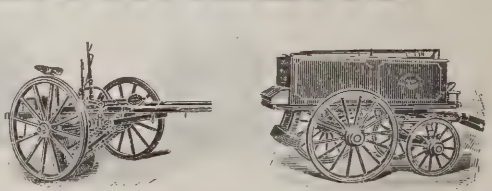
CODES IN USE.—A.I.
A.B.C. 5TH EDITION.
PRIVATE.

TELEPHONE
Nº 59. P.O.

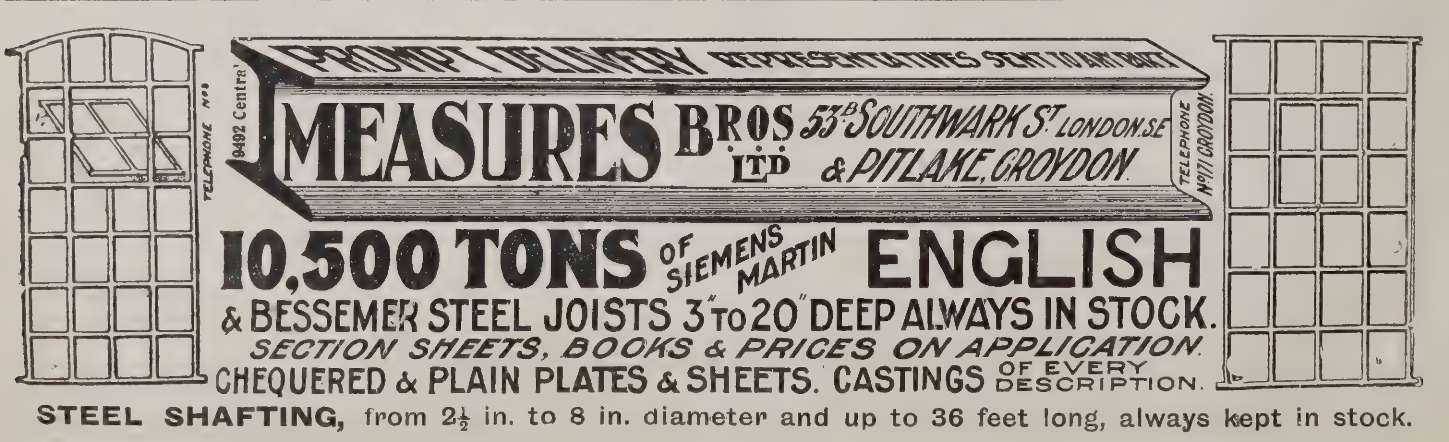
BARROWS & CO. LTD ENGINEERS.



BANBURY
OXON



Portable Engines, 4 to 25 h.p. Combined Engine Boilers and Mortar Mills. Plain Mortar Mills and on Wheels, Street Watering Carts and Vans, Street Sweeping Machines Dust Vans and Carts, Road Scrapers. Write for full particulars and Catalogues.


PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART
TELEPHONE Nº 8492 Central
MEASURES BROS LTD 53B SOUTHWARK ST LONDON. S.E & PITLAKE, CROYDON.
TELEPHONE Nº 171 CROYDON.
10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.
SECTION SHEETS, BOOKS & PRICES ON APPLICATION.
CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.

STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock.

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork.

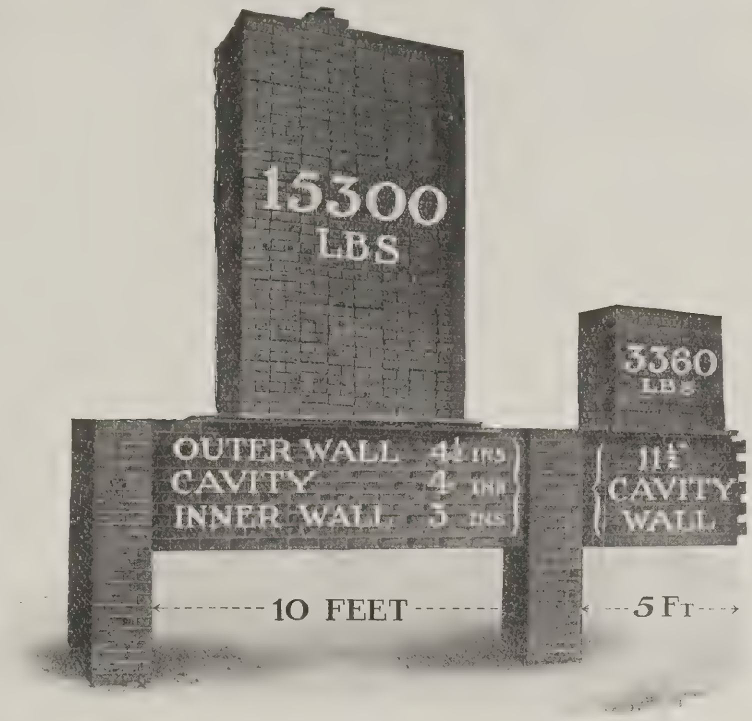
H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

RD. JOHNSON CLAPHAM, & MORRIS, Ltd.,



Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered
Soundproof,
Fireproof
Dampproof,

Architects, Builders, and Contractors

Write for Descriptive Catalogue.

Engineering Department,
24, Lever Street,
MANCHESTER.

Telegrams; "Metallicus, Manchester."

Hollow Wall and Cantilever constructed of 4½-in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

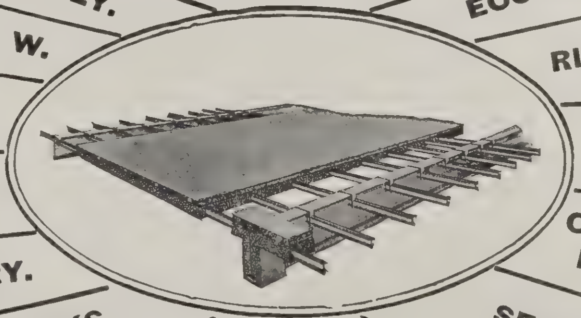
Telephone: 6437 Manchester.

COLUMBIAN FIREPROOFING Co., LTD.

Reinforced Concrete Floors.

RITZ HOTEL, PICCADILLY.
WARING'S, OXFORD ST., W.
ROYAL INFIRMARY, GLASGOW.
"MORNING POST," STRAND.
LAMBETH DISTILLERY.
50 Repeat Orders for L. C. M. BANKS.

ECONOMICAL CONSTRUCTION.
RIGID AND SOUNDPROOF.
SAVING IN COST.
OWNERS & ARCHITECTS ENTIRELY SATISFIED.
SEND FOR PARTICULARS.



"COLUMBIAN" System.

37, KING WILLIAM STREET, LONDON, E.C.

A.W.E. TEL. No. 5060 BANK.

(Tenders continued from page vi.)

London.—For erection of a special school, Brook Green, Hammersmith, for the L.C.C. :—

G. Neal, Tennyson Works, Kilburn	£3,878	0	0
W. M. Glendinnning, Rathgar Road, Brixton	3,707	17	3
A. Roberts and Co., Ltd., Earl's Court Road	3,642	0	0
Rice and Son, Stockwell Road	3,630	0	0
G. Parker, Sumner Road, Peckham	3,607	14	0
G. Godson and Son, Pembroke Works, Kilburn Lane	3,509	0	0
J. Garrett and Son, Balham Hill	3,493	0	0
W. Johnson and Co., Ltd., Wandsworth Common	3,367	0	0
J. Chessum and Sons, Southplace	3,295	0	0
E. Triggs,* The Chase, Clapham	3,285	0	0

Architect's estimate, £3,448.
*Recommended for acceptance.

London.—For erection of a combined school for the accommodation of sixty mentally defective boys and girls and sixty mentally defective elder boys on the Harmood Street site (St. Pancras, W.), for the London County Council :—

Ford and Walton, Ltd., Kilburn	£6,851	0	0
G. S. S. Williams and Son, Thornhill Square	6,657	0	0
Patman and Fotheringham, Ltd., Islington	6,538	0	0
Spencer, Santo and Co., Ltd., Westminster	6,454	0	0
Rice and Son, Stockwell Road	6,353	0	0
C. P. Roberts and Co., Highbury	6,322	0	0
Leslie and Co., Ltd., Kensington Square	6,315	7	5
L. H. and R. Roberts, Islington	6,225	0	0
McLaughlin and Harvey, Ltd., Brecknock Road	5,948	6	0
G. Godson and Sons, Kilburn Lane	5,884	0	0
E. Lawrence and Sons,* Wharf Road, City Road	5,774	0	0

Architect's estimate, £6,901.
*Recommended for acceptance.

Milford Haven.—For the erection of a house at Milford Haven. Mr. C. Launcelot Blethyn, architect :—

Hayward and Wooster, Bath ...	£820		
Fred Lloyd and Co.	646	0	0
E. T. Powell	549	15	0
Henry Adams	538	10	0

Others of Milford Haven.

Homerton.—For subway at infirmary, High Street, for the Hackney Union Guardians. Mr .W. A. Finch, architect, Sidney Road, Homerton, Quantities by Mr. G. T. G. Wright, 3, Great Winchester Street, E.C. :—

Bentley and Son, Leicester	£1,400
Ford, Clift, Willesden, N.W.	1,362
W. Reason, 47, Rosebury Avenue ...	1,349
Rowlingsons and Co., Chancery Lane, W.C.	1,287
Kirk and Randall, Woolwich, S.E. ...	1,240
Dearsly and Son, Chatsworth Road, N.E.	1,203
W. H. Hyde and Co., Norwood Junction, S.E.	1,164
F. and G. Foster,* Norwood Junction, S.E.	974

*Accepted subject to the approval of the L.G.B.

London.—For additional buildings at the Manor Asylum, for the London County Council :—

Ashby and Horner, Aldgate ...	£12,442	0	0
Holliday and Greenwood, Loughborough Junction ...	12,215	0	0
Leslie and Co., Ltd., Kensington	11,821	0	0
Perry and Co., Bow	11,697	0	0
E. Lawrance and Son, City Road, ...	11,540	0	0
J. Greenwood, Ltd., London Bridge	11,428	0	0
Holloway Bros. (London), Ltd., Lambeth	11,400	0	0
Godson and Son, Kilburn ...	10,875	0	0
W. Johnson and Co., Ltd., Wandsworth Common ...	10,790	0	0
J. S. Carmichael,* Wandsworth	10,636	4	2

*Accepted.

Whitby.—For alterations and additions to the end block of tenements in the middle yard of the Seamen's Hospital, Church Street, Whitby, and for other small works at the hospital, for the Trustees. Mr. E. H. Smales, A.R.I.B.A., architect, 5, Flowergate, Whitby :—

J. Kidd and Son, Abbey Terrace	£828	0	0
W. Nelson, Gray Street	806	2	11
A. Palframan, Bagdale	784	19	10
W. Lawson, Sleights	771	2	1
J. Braim and Sons, Silver Street	764	0	11
W. Chapman, Paddock	756	14	0
R. Lennard and Sons, Cliff Street	743	19	0
R. A. Wilson,* Spring Hill ...	721	1	0

All of Whitby.
*Accepted.

Warley (Oldbury).—Accepted for erection of proposed new schools, Abbey Road, Warley, for the Oldbury Urban District Education Committee :—W. Jackson, Langley Green, Birmingham, £9,485.

Watford (Herts).—For erection of a pair of semi-detached villas on Nascott Estate, for Fredk. Gee. Mr. S. E. Gomme, architect :—

Clifford and Gough	£1,469
C. Eames	1,346
Clark Bros.,* Watford	1,272

***Accepted.**

Insurance.

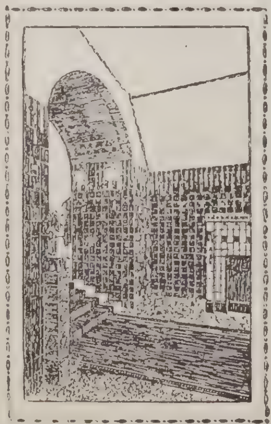
Free £500 Accident Insurance Coupons have this week been sent to the following :

W. B. (London), F. B. (London), F. H. N. B. (Staplehurst), S. T. N. (Brondesbury), J. P. Plumstead), C. S. J. (East Grinstead), S. S. (Kirkintilloch), E. B. F. (Soham), W. F. (Wimbledon), B. H. (Leeds), J. B. (Great Yarmouth), W. L. T. (Liverpool), F. D. (Liverpool), G. B. M. (Aberdeen), A. H. W. (West Drayton), J. T. (Manchester), A. L. P. (Crewe), W. G. J. (Clare), G. K. (Steventon), E. H. S. (Hendon), R. H. W. (Wellington), J. S. (St. Helens), H. S. (Ilford), J. D. (Bristol), L. G. M. (London), P. F. H. (London). J. H. H. (Bury), W. W. (Chester), H. H. (Redditch), C. E. M. (Glasgow), S. N. (Royston), P. H. B. (Sale), O. C. M. (Urmston), A. H. (Cricklewood), G. M. M. (Bushey), W. W. D. (Adelphi), A. J. C. (Blaydon-on-Tyne), R. T. L. (Burslem), E. H. (Newny), A. F. C. (Hampstead), D. M. A. (Edinburgh), J. G. (Perth), C. E. K. (Northampton), T S. (Glasgow), H. P. E. (Gloucester), D. W. M. (Clapton), A. H. H. (London), G. W. S. (Hulme). J. B. L. (Edinburgh), J. W. M. (Newmarket), J. L. E. (Aberystwyth), W. M. (Ebbw Vale), H. H. H. (Carlisle), L. O. (Dundee), W. H. (Millwall), W. E. H (Shrewsbury), W. D. (Treharris), W. S. D. (Kensington), G. M. G. (Sheffield), J. P. (Harringay), R. P. (Crawford), W. E. H. (Wimbledon), E. B. (Ealing), R. E. (Barry), C. S. M. (Birmingham), J. H. M. (Aberdeen), C. H. R. (Wigan), J. P. (Wigan), J. W. M. (Wigan), J. H. M. (Aberdeen), H. D. B. (Chatham), J. J. S. O. (Cheltenham), W. H. M. (Birmingham), A. R. C. E. (Forest Gate), H. H. (Worthing), H. W. (Tunbridge Wells), F. S. S. (Stockwell), F. S. (Castlebar), A. B. D. (Shrewsbury), J. F. T. (Gloucester), A. W. W. (New Barnet), A. C. (Mytholmroyd), F. L. (Fleet), T. A. S. (Newark), W. T. (Watford), P. R. (Birkenhead), J. G. (Bristol), J. W. (Bromsgrove), J. C. (Southsea), E. P. (Portsmouth), G. H. (Middlesbrough), H. W. (Middlesbrough), T. M. (Middlesbrough), S. A. P. (Ash), H. G. (Bermondsey), J. H. (Dunfermline), H. T. F. (Hull), E. S. (Sunderland), S. O. (Warrington), R. D. W. (Lee), E. C. P. (Wisbech), N. W. (Nottingham), W. W. (Oldham), W. H. M. (Chelsea), L. R. W. (Treharris), J. W. (Hackney), G. W. (King's Norton), E. H. (Manchester), J. D. (Manchester).

"THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs,
Premier Ironworks,
DEPTFORD, S.E.

THATCHING AND
REED LAYING.
J. G. COWELL, SOHAM.

WRITE TO THE MANUFACTURERS.
BAYLISS, JONES & BAYLISS, LTD.
FENCING GATES, ETC.
WOLVERHAMPTON & LONDON.
LOW PRICES. CATALOGUES FREE. (NAME THIS JOURNAL.)



"Modernia" Patent Glass Tiles
give an artistic and novel effect.
No glassy surface. Coloured throughout. Substance about $\frac{1}{4}$ inch. Any colour supplied. Prospectus, Samples, Estimates and Designs for complete decorations, free.
The "Modernia" Patent Glass Tile Co.
Sole Concessionaires : Aug. Brennecke & Co., 68 Finsbury Pavement, London, E.C.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Feb. 4. PETERHEAD.—Erection of new corridors at Boddam public school. Plans and specifications may be seen with, and schedule of quantities obtained from the architect. Masons and carpenters should submit tenders by 10 a.m. on Feb. 4 to James Watt, C.E. and architect, 26, Marischal Street, Peterhead

Feb. 4. BRYNMAWR (Mon.).—Rebuilding the old Castle Inn, Brynmawr, Mon., for A. Buchan and Co., Rhymney Brewery, Rhymney. Plans and specification may be seen with T. Roderick, architect, Clifton Street, Aberdare, where bills of quantities may be obtained on application. Endorsed tenders to be sent to T. Edwards, Rhymney Brewery, Rhymney, Mon., by mid-day on Feb. 4.

Feb. 5. ABERCYNON.—Erection of a detached house at Abercynon for D. Evans. Plans and specification may be seen at the office of William Dowdeswell, architect, Treharris, and also at Greenfield House, Abercynon. Tenders, endorsed "House at Abercynon," to be delivered by Feb. 5 to D. Evans, Greenfield House, Abercynon.

Feb. 6. SCAMPTON.—Erection of a new chapel and classroom at Scampton. Plans, etc., may be seen either at Mr. Chantry's, Scampton, or the Rev. A. Morter's, 102, Burton Road, Lincoln.

Feb. 6. HOLYHEAD (Wales).—Erection of a Baptist chapel and school at Holyhead. Builders desirous of tendering may obtain full particulars and bills of quantities from W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff, on deposit of three guineas. Tenders to be delivered by February 6.

Feb. 6. CHILCOMBE.—Erection of a coachman's cottage at Chilcombe, Bicknoller, near Williton, for the Rev. Cecil Martin. Drawings, etc., may be seen at offices of F. W. Roberts, F.R.I.B.A., architect, 2, Hammet Street, Taunton. Tenders to be submitted by Feb. 6.

Feb. 6. NODDFA, TREORKY. — Execution of large extensions at Noddfa Chapel, Treorky. Plans and specification can be seen at the office of Jacob Rees, architect, Pentre, and tenders to be delivered to James Thomas, provision merchant, High Street, Treorky, by Feb. 6.

Feb. 6. YNYSYPLWM, Tonyrefail.—Erection of 60 houses and 6 shops on the Ynysyplwm estate, Tonyrefail, for the Ty'ynycoed Building Club. Plans and specifications can be seen with Philip J. Jones, architect, Cilfynydd, Pontypridd, and Tonyrefail. Sealed and endorsed tenders to be sent to David Jones, secretary to the Ty'ynycoed Club, Handel House, Cilfynydd, Pontypridd, by Feb. 6.

Feb. 6. KENDAL.—Various works required in refronting, converting into two shops, and extensions to the rear of 17 and 19, Finkle Street, Kendal, for Blacow Bros. Plans may be seen and bills of quantities and all other information obtained on application at the office of Stephen Shaw, F.R.I.B.A., architect, 15, Highgate, Kendal, until February 6, upon which date tenders are to be delivered to the architect.

Feb. 6. BITTERNE.—Erection of ten model artizans' dwellings at Bitterne. Builders desirous of tendering should send their names to the archi- will be returned less one shilling. Sealed tect, with a deposit of £1 1s., which tenders to be sent endorsed "Tender for Dwellings," on form provided, by noon on Feb. 6, to W. Guy Prendergast, architect, Sholing, Hants. Plans and specifications can be seen from 9 a.m. to 6 p.m. on ordinary working days.

Feb. 6. MAYNARD'S GREEN, HEATHFIELD.—Erection of a new class room, new offices, etc., at the Maynards Green public elementary school, in the parish of Heathfield, for the East Sussex Education Committee. Persons desirous of tendering are requested to send their names and addresses to F. J. Wood, county surveyor, County Hall, Lewes, by Feb. 6, from whom all particulars can be obtained.

Feb. 6. BUDE, NORTH CORNWALL.—Erection of a new block of Sunday School buildings and caretaker's house, adjoining the Wesleyan Church at Bude, North Cornwall. Drawings, specifications, and conditions may be seen at the office of Ernest Wise, M.S.A., architect, Launceston, by appointment. Tenders sealed and endorsed must be sent to Peter Stacey, J.P., Beachcroft, Bude, by Feb. 6.

Feb. 6. NENAGH, Co. Tipperary.—Erection and completion of a new national school, to accommodate 520 children, at the convent of Mercy, Nenagh, Co. Tipperary, in accordance with plans and specifications prepared by J. O. Moynan, M.A., M.I.C.E., and R. P. Gill, A.M.I.C.E., architects. The work is in two divisions and intending contractors may tender for one or both of the following works:—(1) Erection of school buildings and construction of sewers, etc. (2) Enclosing site and preparing grounds and footpaths. Copies of plans, etc., may be inspected at the office of the architects, and at the office of S. H. Bolton, quantity surveyor, 34, Westland Row, Dublin. Bills of quantities may be had on application to the surveyor on a deposit of £3. Sealed tenders, endorsed "Tender for Work at New School, Nenagh," will be received by Moynan and Gill, architects, Courthouse, Nenagh, signed, up to 10 a.m. on Feb. 6. Tenders, to be accompanied by priced bills of quantities in separate sealed envelope, endorsed "Quantities," and with the name of the sender.

Feb. 8. GORS, LLANDEGFAN.—Erection of a private residence situate at Gors, Llandegfan. Plans and specifications may be inspected at the office of the architect. Tenders, under seal, and endorsed, "House Gors, Llandegfan," to be sent by 10 a.m. on Feb. 8, to Jos. Owen, F.R.I.B.A., architect and surveyor, Menai Bridge.

Feb. 8. BELFAST.—Erection of a building in Murray's Terrace and Athol Street, Belfast, consisting of three separate warehouses and a laundry, for the Belfast Linen Handkerchief Co., Ltd. Quantities have been prepared and may be had on application to S. C. Hunter, 2, Wellington Place, Belfast, on payment of 3 guineas. Plans, specification, and conditions of contract may be seen at the office of James A. Hanna, C.E., architect, Ocean Buildings, Belfast. Sealed tenders, endorsed "Warehouse, Murray's Terrace," to be lodged with the architect by 10 a.m. on Feb. 8.

Feb. 8. OGMORE VALE.—Erection and completion of a large hall, to accommodate about 1,000, a lesser hall, billiard room, and institute, together with reading rooms and library, at Ogmore Vale. Plans and specification may be seen at the present library, Commercial Street, Ogmore Vale, or at the office of W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff, where bills of quantities may also be obtained on deposit of three guineas. Tenders, sealed and endorsed, are to be sent to the secretary, Fred Jones, 1, Meadow Street, Ogmore Vale, by Feb. 8.

Feb. 8. DUBLIN.—Complete restoration of the ornamental plaster ceiling, cobe, and cornice of the council chamber of the city hall, and for the necessary repairs to the plaster of the walls of the council chamber, for the estates and finance committee. Tenders to include the cost of removing the old ceiling, etc., and everything necessary to complete the work. Conditions of contract can be obtained on application to the city architect, Municipal Buildings, Cork Hill, Dublin. Sealed tenders, endorsed "Tender for Ceiling, etc.," addressed to the chairman of the estates and finance committee, will be received at the office of Edmund W. Eyre, city treasurer, Municipal buildings, Cork Hill, Dublin, up to 4 p.m. on Feb. 8. Tenders must contain the names of two solvent sureties for £100.

Feb. 9. WHITEHAVEN.—Additions to the St. Bees Grammar School and schoolhouse. Plans and specifications may be seen on application to the architect, A. Huddart, 9, Lowther Street, Whitehaven, from whom bills of quantities may be obtained on deposit of one guinea. Tenders to be delivered by noon on Feb. 9, to L. T. Helder, clerk to the governors, Whitehaven.

Feb. 10. LISCARD, Cheshire.—Erection of a masonic hall at Liscard, Cheshire. Plans and specification can be seen and quantities6 obtained on application to J. W. B. Harding, architect, 16, Cook Street, Liverpool. Sealed tenders to be delivered to the registered office of the Wallasey Masonic Hall, Limited, 24, North John Street, Liverpool, by Feb. 10.

Feb. 10. MANNINGHAM, BRADFORD.—Various works required in the erection of a store in Westfield Road, Manningham, for the City of Bradford Co-operative Society, Limited. Parties willing to tender may see the plans, and obtain quantities, at the office of William Rycroft, architect, Bank Buildings, Manchester Road, Bradford, from Feb. 3 to Feb. 10, on which last-named day sealed tenders are to be sent to the society's office only, 65, Sunbridge Road, Bradford, endorsed "Tender—Westfield Road."

Feb. 10. YORK.—Platform roofing at the south end, York passenger station, for the directors of the North-Eastern Railway. Plans and specification may be seen and quantities and further information obtained upon application to William Bell, the company's architect, at York. Quantities supplied, on personal application, to parties tendering for the whole of the works. Sealed tenders, marked "Roofing, York Station," to be sent by 9 a.m. on Feb. 10, R. F. Dunnell, secretary, York.

Feb. 11. BARDSEA, near Ulverston.—Erection of a new police station at Bardsea, near Ulverston, for the standing joint committee of the Lancashire C.C. Plans may be seen and bills of quantities obtained by deposit of £2, at the office of Henry Littler, county architect, 16, Ribblesdale Place, Preston. Tenders, sealed and endorsed, are to be forwarded by the morning of Feb. 11, to the county architect.

Feb. 11. BRIDLINGTON.—Erection of a retaining wall, with palisading thereon, adjoining marine drive; also erection of dwarf wall and palisading, to surround the proposed Pembroke Gardens, for the corporation, in accordance with plans and specifications, to be seen at the office of E. R. Matthews, A.M.I.C.E., borough surveyor, town hall, Bridlington, at any time during office hours. Separate tenders, endorsed "Retaining Wall," and "Dwarf Wall and Palisading" respectively, to be sent by Feb. 11, to A. E. Matthewman, town clerk, town hall, Bridlington.

Feb. 11. LLANFAIR P.G.—Erection of a new council school at Llanfair P.G. for the Anglesey Education Committee. Plans and specifications may be inspected at the office of Jos. Owen, F.R.I.B.A., county architect, Menai Bridge, between 9.30 a.m. and 5.30 p.m. Tenders, sealed, and endorsed "Llanfair P.G. School Tender," to be sent to R. H. Williams, secretary of education, education offices, Llangefni, by 10 a.m. on Feb. 11.

Feb. 12. HISTON (Chesterton, Cambs.).—Erection of a mortuary and shelter at the isolation hospital at Histon, for the R.D.C. Plans and specifications can be seen at the office of John F. Symonds, clerk, 9, Bene's Street, Cambridge. Sealed tenders, endorsed "Mortuary at Isolation Hospital," to be sent to the clerk by February 12.

Feb. 12. LONDON. — Enlargement of the western district parcel office and Mayfair Telephone exchange, for the commissioners of H.M. Works and Public Buildings. 2nd contract. Drawings, specification, and a copy of the conditions and form of contract, may be seen on application to J. Wager, A.R.I.B.A., H.M. office of works, etc. Bills of quantities and forms of tender may be obtained at the under-mentioned address on payment of one guinea. Tenders must be delivered before noon on Feb. 12, to the secretary, H.M. office of works, etc., Storey's Gate, London, S.W., and endorsed "Tender for Western District Parcel Post Office, etc., 2nd contract."

Feb. 13. BROUGHTON MOOR (Cumberland).—Execution of the various works required in the erection of a small-pox hospital, consisting of a ward, pavilion, administration block, mortuary, etc., at Broughton Moor, for the Derwent joint small-pox hospital board. Drawings and specifications may be seen and form of tender obtained at the office of H. B. Williams, architect to the board, Oxford Street, Workington. Sealed tenders, endorsed "Small-pox Hospital," to be delivered to John Warwick, clerk, town hall, Workington, by February 13.

Feb. 13. GLASGOW.—Execution under one contract of the excavator, brick, and mason, timber, and other works required in the construction of the office buildings, etc., at Shieldhall, for the corporation. Plans, specifications, and working drawings may be seen and specifications and schedules of quantities and forms obtained, on application to the city engineer, City Chambers, 64, Cochrane Street, Glasgow, by depositing one guinea. Sealed tenders, marked outside "Tender for Office Buildings, etc., Shieldhall," must be lodged with A. W. Myles, town clerk, City Chambers, Glasgow, by February 13.

Feb. 15. BIRKENHEAD.—Erection and completion of extensions to the infectious diseases hospital, Flaybrick Hill, for the corporation. Plans, specifications, and particulars, can be seen, and bills of quantities and form of tender obtained, on application at the office of Charles Brownridge, M.Inst.C.E., borough engineer and surveyor, upon deposit of £1 1s. Tenders, on forms supplied, sealed and endorsed "Tender for extensions: Infectious Diseases Hospital," to be sent to James Fearnley, town clerk, town hall, Birkenhead, by 4 p.m. on Feb. 15. Sureties required. Fair wages clause.

Feb. 15. PORTSMOUTH.—Erection of 16.A. and 10.B. married soldiers' quarters at Clarence Barracks, Portsmouth, in the southern command, for the secretary of state for war. Plans, specification, and conditions of contract may be inspected at the office of the director of barrack Construction, 80, Pall Mall, London, S.W., or at the barrack construction office, Clarence Barracks, Portsmouth, on Feb. 3, 4, and 5. Those desiring to tender and to receive bills of quantities must apply to the director of barrack construction, by Feb. 8. The application must be accompanied by a deposit of 10s. Cheques, or orders to be made payable to the assistant financial secretary, and crossed "Bank of England for credit to Army Funds." Tenders, on the form supplied, with the bills of quantities, must be delivered in sealed envelopes, marked "Tender for Married Quarters, Clarence Barracks, Portsmouth," by noon on Feb. 15, to H. De la Bere, director of army contracts, War Office, Whitehall, London, S.W. The bills of quantities should accompany the tender in a separate sealed envelope, similarly addressed and marked "Bills of quantities, Married Quarters, Clarence Barracks, Portsmouth," with the contractor's name and address thereon.

Feb. 16. ATHY (Ireland).—Erection and completion of a new Crown post office at Athy, for the board of public works. Tenders will be received by 10 a.m. on Feb. 16, by H. Williams, secretary, office of public works, Dublin. Plans and specification can be seen at the office of the secretary, and at the post office, Athy. Forms of tender and bills of quantities will be supplied on deposit of £1. The accuracy of the quantities is not guaranteed.

Feb. 16. DURHAM.—Erection of new Council Schools at North Brancepeth, Medomsley Edge, and New Brancepeth; enlargement of Langley Park Infants' Council School; alterations and improvements at Ouston, Wingate Infants', Hawthorn, Rowland's Gill, and West Stanley Infants' Council School, for the County Council. Plans, specifications, and general conditions of contract can be seen, and bills of quantities obtained, as follows: (1) For schools at North Brancepeth (Langley Moor), and New Brancepeth (Sleetburn), and alterations at Ouston, Wingate, Hawthorn, Rowland's Gill, and West Stanley, at the office of F. E. Coates, Shire Hall, Durham. (2) For schools at Medomsley Edge, at the office of J. J. Eltringham, architect, Blackhill. (3) For enlargement of Langley Park infants' council school, at the office of W. Rushworth, Shire Hall, Durham. Sealed tenders endorsed with name of school to be sent before Feb. 16 to A. J. Dawson, clerk to the education committee, Shire Hall, Durham.

Feb. 17. MANCHESTER.—Erection of additional goods office, etc., at Ancoats goods depot, Manchester, for plans and specifications may be seen, quantities and particulars obtained, on application at the engineer's office, Derby Station. Sealed tenders to be forwarded by post to Alexis L. Charles, secretary of the Way and Works Committee, Midland Railway, Derby, by 9 a.m. on Feb. 17.

Feb. 20. BELFAST.—Erection of two semi-detached villas at Fruithall Park, Falls Road. Plans and specifications can be seen with Young and Mackenzie, Scottish Provident Buildings, Belfast, where sealed and endorsed tenders must be lodged by Feb. 20.

Feb. 23. LEYTON.—Erection of the Canterbury Road Council Schools, Leyton, for the U.D.C. Quantities, conditions, and form of tender may be obtained on written application to William Jacques, A.R.I.B.A., 2, Fen Court, Fenchurch Street, E.C., by Feb. 13, which application must be accompanied by a deposit of a £5 Bank of England note. Sealed tenders, in special endorsed envelopes supplied, must be delivered by hand at a meeting of the Council, to be held at 7 p.m. on Feb. 23. Conditions include a trades union clause, copy of which, with plans, may be seen at the architect's office. Sureties required

March 2. STORNOWAY.—Erection of church spire for the Deacons' Court of the United Free English Church, Stornoway. Plans and specifications to be seen in the hands of Neil MacCallum, clerk to Deacons' Court, Stornoway, with whom sealed offers, marked "Tender for Spire," may be lodged by March 2.

No date. LEEDS.—Separate works required in the erection of two houses, and alterations to premises, Hyde Park Road, Leeds. Persons desirous of tendering should forward their names (stating trade) to Fred. Mitchell, architect and surveyor, 9, Upper Fountaine Street, Albion Street, Leeds, at once.

No date. MACHYNLLETH. — Re-constructing Paternoster Buildings, Machynlleth, into post office premises. Plans and specifications upon application to W. Davies, architect and surveyor, Carno. Sealed tenders to be sent to the above, or R. Llewellyn Jones, Machynlleth.

No date. HIGHTOWN, Wrexham.—Erection of (1) a church at Hightown, Wrexham; (2) moving existing building and forming boundary walls. Quantities, conditions of contract, and date of receiving tenders may be obtained on deposit of 10s., from Prothero, Phillott, and Barnard, architects, 13, Promenade, Cheltenham.

No date. LEEDS.—Construction of an additional fireplace and chimney and other minor alterations at the Colton provided school, near Leeds. Specification and bill of quantities may be obtained from R. J. Smith, Education offices, Garforth, near Leeds.

No date. HAMMERSMITH.—Erection of a small concert-hall at Hammersmith. Plans supplied on deposit of one guinea. Persons desirous of tendering should apply to the architect, at Horncastle's, Cheapside, London, who will supply particulars.

No date. LLANDINAM.—Erection of a new vicarage at Llandinam for the Rev. James Jones, vicar. Plans, specification, and further particulars may be obtained on application to the architects, Deakin and Howard Jones, M.S.A., Plas Ynys, Borth, R.S.O.

No date. BIRSTAL. — Taking down Popeley House, Birstal, and the erection of outbuildings. Contractors willing to tender are requested to send their names to the architects, Joseph F. Walsh, F.S.I., and Graham Nicholas, F.R.I.B.A., Museum Chambers, Halifax.

No date. LEEDS.—Erection of two houses and alterations to premises, Hyde Park Road, Leeds. Contractors willing to tender for any of the separate works are requested to forward their names (stating trade) to Fred Mitchell, architect and surveyor, 9, Upper Fountaine Street, Albion Street, Leeds, and quantities will be supplied in due course.

ENGINEERING.

Feb. 4. WOODFOOT, DUMFRIES.—Taking down the existing timber bridge over the river Annan, at Woodfoot, about two miles from Beattock Station, and supplying and erecting a new steel girder bridge of three spans, for the Lockerbie District Committee. Plans may be seen at the office of the engineers, Crouch and Hogg, C.E., 14, Blythswood Square, Glasgow, from whom copies of the specification, schedule of quantities, and form of tender may be obtained on payment of one guinea. Sealed tenders, marked "Woodfoot Bridge," must be lodged by 10 a.m. on Feb. 4, to John F. Cormack, district clerk, Lockerbie District Committee.

Feb. 8. HEXHAM.—Construction of covered service reservoirs and works connected therewith to supplement the present works for the Corbridge water supply, for the R.D.C. Plans and specifications may be seen and quantities and other particulars obtained on application to the engineer, P. E. Parker, Assoc. M.Inst.C.E., Post Office Chambers, Newcastle-on-Tyne, on deposit of one guinea. Sealed tenders, marked "Corbridge Water," to be delivered by 10.30 a.m. on Feb. 8, to J. H. Nicholson, clerk to the council, Midland Bank Chambers, Hexham.

March 4. NORWICH.—Heating the Guildhall and Municipal offices, for the Corporation. Plans and specifications may be seen and forms of tender obtained on application at the office of the engineer. Tenders on the forms supplied, enclosed in envelopes sealed with sealing wax, endorsed, "Guildhall Heating," and addressed to the chairman of the city committee, must be delivered by 10 a.m. on March 4, to Arthur E. Collins, M.Inst.C.E., city engineer, etc., Guildhall, Norwich.

IRON AND STEEL.

Feb. 4. EDINBURGH.—Construction of a new 2 ft. by 3 ft. egg-shaped brick and concrete sewer for West Merchiston and Gorgie districts, 10 yds. or thereby, constructed in open cut and 314 yds. or thereby in tunnel, all conform to plans, specification, general conditions of contract, and schedule of measurement prepared by the burgh engineer, from whom schedules of measurement and all particulars may be obtained. Sealed offers, endorsed "Tender for W. Merchiston and Gorgie District Drainage," accompanied with priced schedule, must be lodged before 10 a.m. on Feb. 4, with Thomas Hunter, W.S., town clerk, City Chambers, Edinburgh.

Feb. 4. MANCHESTER.—Iron and steel work required in the extension of an elevated railway siding at Gaythorn station, for the Corporation Gas Committee. General conditions of contract, specification, and bill of quantities can be obtained on application to C. Nickson, superintendent, gas department, town hall. Drawings can be seen and any other information obtained on application to the engineer, J. G. Newbigging, M.Inst.C.E., at Rochdale Road Station. Sealed tenders, addressed to the chairman of the gas committee, and endorsed "Tender for Elevated Railway Siding, Gaythorn Station," must be delivered at the gas offices, town hall, Manchester, by noon on Feb. 4.

Feb. 8. NOTTINGHAM.—Supply and erection of about 360 lineal yards of three rail wrought iron hurdle fencing, gates, etc., at the recreation ground, Carlton Road, for the public parks committee of the corporation. Plans may be seen and specification and forms of tender obtained from Frank B. Lewis, city architect, Guildhall, on deposit of 2 guineas. Sealed tenders to be sent by noon on Feb. 8, endorsed "Tender for Fencing Recreation Ground, Carlton Road," to J. A. H. Green, town clerk, Guildhall, Nottingham. Fair wages clause.

Feb. 20. WARRINGTON.—Supplying the following materials for a period of twelve months, from April 1, for the water committee of the corporation:—Section 1, cast-iron pipes, valves, and cast-iron surface boxes; 2, bib, stop, and ball-cocks, and ferrule couplings; 3, cylinder and engine oils; 4, canting. A deposit of 10s. per section is required. Further particulars may be obtained from James Deas, A.M.I.C.E., water engineer, municipal offices, Warrington, to whom tenders are to be sent by 10 a.m. on Feb. 20.

PAINTING.

Feb. 8. BUTTERSHAW.—Painting, etc., internally, the Buttershaw Congregational Church. Specifications may be obtained on and after Feb. 1, from the secretary, J. H. Kellett, 16, Orleans Street, Buttershaw, to whom all tenders must be sent, sealed and endorsed "Tender for Painting," by Feb. 8.

PLUMBING & SANITARY

FEB. 6. RUNCORN.—Construction of about 500 yards of 9-inch sewers with manholes and other appurtenant works in Sandy Lane, Western Point, for the R.D.C. Drawings and specifications may be seen and form of tender obtained at the council offices, 71, High Street, Runcorn. Sealed tenders, endorsed "Sandy Lane Sewer," must reach the council offices by 10 a.m. on Feb. 6.

Feb. 3. THIRSK.—Installation of a central hot water supply for the following departments at the workhouse, for the whole tenders, together with specifications, plans, drawings, etc., for the Guardians of the Poor:—Kitchen, male vagrant wards, wash-house, and feed for large boiler. The workhouse plan may be seen at the workhouse, and the respective departments inspected at all reasonable times between 10 a.m. and 4 p.m. till Feb. 6. Sealed tenders endorsed "Tender for Hot Water Supply," must reach William Swarbreck, clerk, union offices, Finkle Street, Thirsk, by noon on Feb. 8.

Feb. 8. FISHGUARD (PEMBROKE).—Construction of an outfall sewer, consisting of about 700 yards of 9in., 450 yards of 12in. pipe sewer, 80 yards of 9in. cast-iron outfall pipe, manholes, etc., for the U.D.C. Plans, specifications, and forms of contract can be seen at the district council offices, Fishguard, on application to D. J. Wilcox, surveyor to the council. Copies of abridged specifications, quantities, and tender can be obtained from the surveyor on deposit of cheque or postal order for one guinea. Sealed tenders, properly endorsed, must be delivered by noon on Feb. 8, to A. J. Hodges, clerk to council, town hall, Fishguard.

Feb. 8. MANCHESTER.—Execution of general contractors' and plumbers' work required in connection with the drainage of houses and other premises for a period of twelve months, ending March 31, 1910, for the Corporation. Forms of tender, general conditions, and specifications for each of the seven sections of the city may be obtained and samples of work and materials seen on application to H. Prescott, manager of the drainage department, on payment of £1 1s. for each of the said sections. Sealed tenders, addressed to the chairman of the drainage, etc., sub-committee, will be received at the drainage department by 10 a.m. on Feb. 8.

Feb. 10. STALYBRIDGE AND DUKINFIELD.—Extension of the sewage works, for the joint sewerage board, consisting of—Alterations to existing tanks, construction of roughing filters, conversion of present filters into percolating filters, with all cast iron pipes, sluices, valves, and appurtenant works in connection therewith. Plans, sections, detail drawings, with specification and general conditions of contract, may be inspected, and any other particulars obtained on application to the engineer, J. P. Wilkinson, M.Inst.C.E., at his offices, 301, Cathedral Street, Manchester, on deposit of two guineas. Tenders, properly sealed and endorsed "Tender for Sewage Works Extensions," must be addressed to the chairman of the joint board, and delivered by 10 a.m. on Feb. 10, to William Moss, clerk to the joint board, Market Place, Ashton-under-Lyne.

Feb. 11. BRIDLINGTON.—Demolition of existing lavatories, and erection of new lavatories, for the Corporation, in accordance with plans and specification, which may be seen at the borough surveyor's office, town hall, any time during office hours. Tenders, endorsed "Beaconsfield Lavatories," to be sent by Feb. 11 to A. E. Matthewman, town clerk, town hall, Bridlington.

Feb. 11. TREFDRAETH.—Erection of a new council school at Trefdraeth, for the Anglesey education committee. Plans and specifications may be inspected at Bodra Golwyn Farm, Trefdraeth, and at the office of Jos. Owen, F.R.I.B.A., county architect, Menai Bridge. Tenders, sealed and endorsed "Trefdraeth School Tender," to be sent to R. H. Williams, secretary of education, education offices, Llangefni, by 10 a.m. on Feb. 11.

Feb. 12. YEOVIL.—Providing and laying about 600 yds. of 9in. sewer and other works in connection therewith, for the R.D.C. Drawings and specification may be seen at 30, Kingston, Yeovil, where a copy of the bill of quantities may be obtained on deposit of £1. Sealed tenders, endorsed "Haselbury Plucknett Sewerage," must be delivered by Feb. 12, to J. E. Rodber, clerk, 30, Kingston, Yeovil.

Feb. 19. LEEDS.—Construction, completion and maintenance of six new filter beds, together with the laying of outlet and inlet pipes and other work in connection therewith, being the second section of the new filter beds at Headingley, Leeds, for the waterworks committee. Copies of conditions, specification, quantities and tender form may be obtained at the office of the waterworks engineer, Municipal Buildings, Leeds, on deposit of £1. Arrangements will be made by which intending contractors may visit the site of the works on application to the waterworks office. Tenders, endorsed "Tender for Filter New Beds," should be sent by 10 a.m. Feb. 19, addressed to "The Chairman of the Waterworks Committee, Town Clerk's Office, Leeds."

ROADS AND CARTAGE.

Feb. 4. CHESTER.—Making West Street and back passages, in the parish of Newton-by-Chester, for the R.D.C., in accordance with the plans, specifications, etc., prepared by C. J. Owen, surveyor. Plans, specifications, etc., and all other particulars may be obtained on application to the surveyor, Dee Banks, Chester. Tenders to be sent endorsed "Tender for Street Works," by Feb. 4, to R. D. Nicklin, acting clerk, Forest House, Chester.

Feb. 4. ISLE OF ELY. — Supply of broken materials for the repair of main roads for the year ending March 31, 1910, for the C.C. Specifications and form of tender can be obtained upon the receipt of a stamped addressed foolscap envelope at the offices of H. Farr Simpson, county surveyor, northern division, Wisbech; R. S. W. Perkins, county surveyor, southern division, Ely. Tenders to be sent before 10 a.m. on Feb. 4.

Feb. 4. HOUNSLOW.—Execution of the following works:—(1) Making up Campo Road, Hounslow. (2) Making up Ailsa Avenue, St. Margaret's, for the Heston and Isleworth U.D.C. Plans, sections, and specification may be seen, and bills of quantities and form of tender obtained from J. G. Carey, engineer and surveyor, council house, Hounslow, on payment of £1 1s. Sealed tenders, on the form provided, must reach H. J. Baker, clerk, council house, Hounslow, by noon on Feb. 4, endorsed, as the case may be.

Feb. 6. CHELMSFORD. — Supply of Norway granite kerb and setts, for the year ending March 31, 1910, for the Essex County Council. Forms of tender and special envelope, and all other information and particulars, can be obtained at the chief surveyor's office. Tenders to be delivered by Feb. 6, to Percy J. Sheldon, M.Inst.C.E., chief surveyor, office of the chief surveyor, Chelmsford.

Feb. 8. GLANFORD, BRIGG.—Leading road material between April 1, 1909, and March 30, 1910, for the R.D.C. Forms of tender may be had on application to Frank C. Hett, clerk, to whom all tenders must be delivered by Feb. 8.

Feb. 8. HERNE HILL.—Kerbing, channelling, foundations for asphalte paving, roadwork, etc., in Frankfurt Road, Herne Hill, for the corporation of Camberwell. Specifications and forms of tender can be obtained from William Oxtoby, borough engineer, town hall, Camberwell. Tenders must be delivered by 6.30 p.m. on Feb. 8.

Feb. 8. HOLLAND (Lincolnshire).—Supplying about 15,288 tons of broken granite, 240 tons of granite chips, 1,450 tons of broken slag, 465 tons of coarse builders' sand, for the C.C., to be delivered at the different railway stations in the county. Conditions and forms of tender may be obtained of the clerk. Sealed tenders to be sent to H. Chaderton Johnson, clerk of the C.C., office of the clerk, Sessions House, Boston, marked "Tender for Granite, Slag, or Sand," by 10 a.m. on Feb. 8.

Feb. 8. KENT.—Laying, when and where required, Kentish rag tar paving at council schools under the administration of the Kent C.C.; also carrying out any repairs to tar paving, for the Education Committee. Copy of specification and form of tender will be sent on application to the secretary, on deposit of £1. Firms tendering must submit particulars of their quarries (which must be situated in Kent) and the material must be manufactured in the county. Sealed tenders must be delivered by noon on Feb. 8, to Fras. W. Crook, secretary, Caxton House, Westminster, S.W.

Feb. 9. POTTERSPURY.—Supply of granite (broken and unbroken), and slag for the year ending March 31, 1910, for the R.D.C. Forms of tender, with quantities required, and full particulars, may be obtained on application to James B. Fairchild, Potterspury, Stony Stratford, surveyor to the council. Tenders, marked "Tender for Materials," to be sent by Feb. 9, to W. R. Parrott, clerk to the council, High Street, Stony Stratford. Samples of stone to be delivered at the workhouse, Yardley Gobion, by Feb. 9.

Feb. 10. BRADFORD.—Supply of about 20,000 tons of road metal, required for the macadamised roads within the city, for the corporation. Form of tender may be obtained on application at the office of W. H. S. Dawson, city engineer and surveyor, town hall. Sealed tenders, endorsed "Tender for Road Metal," to be sent to Frederick Stevens, town clerk, town hall, Bradford, by Feb. 10. Fair wages clause.

Feb. 10. WELLINGTON (SALOP).—Kerbing, channelling, and flagging with adamant concrete a number of streets and footpaths in the Urban District of Wellington, Salop. Plans and sections of the proposed works (in four separate contracts) may be seen at the office of Geo. Riley, the council's surveyor, 14, Walker Street, Wellington, Salop, by appointment, and on production of copy specification and quantities. Specification and quantities of the four contracts may be obtained from the clerk, on deposit of cheque for £2 2s. Sealed tenders, endorsed "Streets," must be sent by Feb. 10 to J. W. Littlewood, clerk to the council, Bank Chambers, Wellington, Salop.

Feb. 11-22. SPALDING. — Supplying granite, slag, shingle, and gravel for the repair of highways, for the R.D.C. Tenders must be made on forms which may be obtained on application to H. Stanley Maples, clerk to the council, or will be sent on receipt of addressed envelope or post wrapper, delivered by Feb. 11, Samples to be sent to the union workhouse, by 9 a.m. on Feb. 22.

Feb. 12. HORNCASTLE.—Supplying about 6,485 tons of granite (XX) and about 1,440 tons of slag ($1\frac{3}{4}$ in.) to be delivered between April 1 and Oct. 30, in quantities and at times as the council or district surveyor shall direct. Specifications, conditions of contract, and forms of tender may be obtained on application at the office of the council. Tenders, marked on the cover, "Tender for Road Material," must be sent by post by Feb. 12, to J. E. Chatterton, clerk, council offices, Horncastle. Sureties possibly required.

Feb. 13. ILFORD.—Levelling and tar-paving the playgrounds of Valentine's School, Beehive Lane, Ilford, for the Education Committee. Plans and specifications may be seen, and form of tender obtained, upon application to the architect, G. J. Dawson, F.R.I.B.A., 11, Cranbrook Road, Ilford. Tenders, in sealed envelopes, endorsed "Tender for Tar-paving," to be delivered by noon on Feb. 13th, to W. S. Torbitt, M.A., LL.B., secretary, education offices, Cleveland Road, Ilford.

Feb. 13. BATH.—Supply of granite and basalt in lump; also macadam and chippings, for the county main roads, to be delivered to the various stations, wharves, and sidings, during the financial year ending March 31, 1910, for the Somerset county council. Specifications, schedule of approximate quantities required at the various stations and wharves, and forms of tender can be obtained upon application to the county surveyor, Bath. Sealed tenders, endorsed "Tender for Road Material," and samples of the macadam to be delivered by Feb. 13, to H. T. Chapman, county surveyor, 1, Chapel Row, Queen Square, Bath.

Feb. 15. GOSPORT AND ULVERSTOKE. — Making up the following private streets, for the U.D.C.: Bevis Road, Blake Road, Burnett Road, Coward Road, Cobden Street (part of), Parham Road, Stone Lane. Plans may be seen and copies of the specifications, bills of quantities, and forms of tender obtained at the surveyor's office on deposit by cheque of two guineas. Tenders must be sent in special envelopes supplied, by noon on Feb. 15, to E. Talbot Palmer, clerk to the council, Gosport.

Feb. 15. STREATHAM.—Making up and paving Parklands Road, Streatham, for the corporation of Wandsworth. Specification and drawings may be seen, and forms of tender obtained, at the borough engineer's office (new streets department), 56, East Hill, Wandsworth, S.W.), between 10 and 4 (Saturdays 10 and 12). Tenders, enclosed in sealed envelopes, and endorsed "Tender for Paving Parklands Road," must be delivered at the Council House, East Hill, Wandsworth, S.W., and may be placed by the person tendering in the box provided for the purpose by 4 p.m. on Feb. 15. Sureties may be required. Fair wages clause.

Feb. 16. LONG SUTTON, Lincs.—Supplying:—Granite, 590 tons XX broken. Slag, 100 tons, $1\frac{3}{4}$in. broken, also separate tenders for:—Granite, 150 tons X broken. Slag, 200 tons $2\frac{1}{4}$ in. broken, for the U.D.C. To be delivered, carriage paid, to Long Sutton station during the year in quanitites and at times ordered by the surveyor. Tenders, with samples, to be sent marked "Tenders for Material," by Feb. 10, to Saml. S. Mossop, clerk to the council, Long Sutton, Lincolnshire. The council have no form of tender.

Feb. 17. GLOUCESTERSHIRE.—Supply of stone for use on main roads for the year beginning April 1, 1909, and ending March 31, 1910, for the County Council. Forms of tender can be obtained from the county surveyor. Tenders must be delivered by Feb. 17th, marked outside "Tenders for Material," to E. S. Sinnott, M.Inst.C.E., county surveyor, Shire Hall, Gloucester.

Feb. 22. LITTLE HULTON (near Bolton).—Supplying broken granite, grit setts, granite and limestone chippings, grit kerbs, artificial and natural flags, stoneware pipes and gullies, cement, steam road rolling and scarifying, disinfectants, pitch and oil, for the U.D.C. Forms of tenders and particulars can be obtained from James H. Heyes, clerk, council offices, Little Hulton, near Bolton, any day between 9 a.m. and 5 p.m. Tenders, sealed and endorsed "Tender for ——," to be delivered at the council offices by 4 p.m. on Feb. 22.

March 2 MERIONETH.—Maintenance and repair of the rural main roads of the county, for the C.C. Particulars, specifications, bills of quantities, etc., may be obtained on application to E. Vaughton, county surveyor, Arthog, Dolgelley. The county is divided into 4 districts, and intending competitors may tender for any or all. As it has not been definitely decided whether the contract will be let for a period of 1, 3, or 5 years, tenders must be sent to cover each of those periods. Tenders to be delivered to David Breese, clerk to the council, Portmadoc, by 10 a.m. on March 2.

MISCELLANEOUS.

Feb. 8. MANCHESTER.—Execution of general contractors' and plumbers' work that may be required for the corporation, in connection with the drainage of houses and other premises, for a period of twelve months, ending March 31, 1910. Forms of tender, general conditions and specifications for each of the seven sections of the city may be obtained and samples of work and materials seen on application to H. Prescott, manager of the drainage department, on payment of £1 1s. for each of the said sections. Sealed tenders, addressed to the chairman of the drainage, etc., sub-committee, will be received at the drainage department, by 10 a.m. on Feb. 8.

Feb. 16. BROMLEY.—Supplying timber, ironmongery, builders' materials, tools, oils, paints, etc., ironfounders' work, tar-paving materials, steam road rolling, for the Corporation. Particulars and conditions may be obtained at the Municipal Buildings on payment of 10s. Tenders, duly sealed and endorsed, must be delivered to Fred. H. Norman, town clerk, municipal offices, Bromley, Kent, by 3 p.m. on Feb. 16.

No date. TYERSAL.—Execution of slater's, plumber's, and plasterers work, required for 23 houses, Akeroyd Park, Dick Lane, Tyersal. Persons desirous of tendering should apply to I. F. Akeroyd, 31, Springfield Crescent, Lidget Green, or on the job.

THE
Federated Employers'
Insurance
Association, Ltd.

HEAD OFFICES:
30, Cross Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ADVERTISER (28), seeks re-engagement, ten years' thorough practical knowledge of building, estate management, and repairs, etc.; experienced in preparing plans and estimates, including quantities, for new works: highest refs. — Y., 86, Coniston Road, Muswell Hill, N. 4805

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill. 4809

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. 4828

ARCHITECT and Surveyor's Assistant desires engagement; 6½ years' sound provincial experience; good draughtsman, working drawings, details, colourist; perspectives, surveying, levelling; assist quantities; general routine, specimen drawings; highest references; moderate salary.—S. Osgood, Chelsfield Park, Orpington, Kent. 4801

ARCHITECT and Surveyor's Assistant (25), six years' London experience, design, surveying, quantities, Hon. Building Construction Inter.R.I.B.A.; excellent references; salary £2 2s.—Apply Box 4780, Builders' Journal Office.

ARCHITECT'S Assistant (23), desires engagement; 7 years' eaxperience.—Sedgwick, Belvedere Road, Sunderland.

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECT'S Assistant (23), late pupil, seven years' all-round experience, been clerk of works, working drawings, details, etc., knowledge of quantities and perspective.—E. P. Lee, 631, Commercial Road, London, E. 4781

ARCHITECTS, builders, estate agents (19), good energetic draughtsman, tracing, colouring, working drawings, etc.; willing to assist in office work; references.—F. J. Williams, 89, Shrubland Street, Leamington Spa, Warwickshire. 4796

ARCHITECT'S good all-round Assistant; 10 yrs.' exp. North, South, and Wales; quans., details, working drawings; mod. salary.—W. T., 14, Stanhope Road, Stockton-on-Tees. 4798

ARCHITECT'S assistant (23), over 7 years' London and Provincial experience; excellent references; Inter.R.I.B.A. Exam. — H. J. Wilson, "Brinkdale," Park Road, Peterborough. 4670

ARCHITECT and Surveyor's Assistant (21), seeks re-engagement; 5 years' experience in church and domestic work in larger provincial office; good draughtsman and colourist.—Box 4823, Builders' Journal Office.

ARCHITECT'S Junior Assistant (19), 4 years experience in West End Office, working drawings, details, perspectives, competitions, excellent references; salary 21s.—Box 4777, Builders' Journal Office.

ARCHITECT'S Assistant (23), seven and a quarter years' varied London and provincial experience. First-class draughtsman, details, surveying, and general routine. Excellent references. Inter. R.I.B.A.—H. J. Wilson, 90, Park Road, Peterborough. 4812

ARCHITECT'S, Surveyor's or Builder's Assistant (23), Inter.R.I.B.A., good draughtsman, levelling, surveying, specifications, assist quantities, supervision, estate work, correspondence, accounts; excellent references; moderate salary.—H. O'R., 80, Lavender Sweep, Clapham, S.W. 4810

ARCHITECT'S Assistant, thoroughly experienced, temporary employment; domestic work, business premises, schools, etc.; surveying and levelling, etc.; two years' experience in Structural Engineer's office; salary moderate. — Box 4820, Builders' Journal Office.

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Box 4815, Builders' Journal Office.

ARCHITECT, estate agent, or builder's assistant, experienced in all branches; good references.—R. S., Eagle House, Marine Parade, Clacton-on-Sea. 4816

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, Builders' Journal Office.

ARCHITECT'S son, 10 years' office experience, wishes to take up agency or post as representative in Lancashire, or North of England, to well-known firm in any special line of Building trade. —Apply Box 4585, Builders' Journal Office.

ASSISTANT (27), good rapid draughtsman, competent all branches, will accept small salary for re-engagement in or near London.—Ernest Frost, "Dunsmore," Horeham Road, Sussex. 4824

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

BUILDER'S general foreman, advertiser seeks engagement; 16 years' service as above with first-class London firm on important and various works; good references.—Address H., 150, Effra Road, Wimbledon, S.W. 4703

BUILDER'S or architect's assistant, 25, desires re-engagement, drawing, typewriting, shorthand, correspondence, accounts, and general office routine; also assist in quantities; excellent references, moderate salary.—Apply Box 4756, Builders' Journal Office.

BUILDERS' Assistant desires work; plans, estimates, setting out buildings, measuring up, prime costing, surveying, and levelling plots, ordering exact quantities, materials; 11 years' experience.—Box 4803, Builders' Journal Office.

BUILDER'S or Architect's Junior Assistant (18), good tracer, well up in prime cost, and general office work; excellent references; three years' experience. — J. W., 164, Wellesley Road, Ilford, Essex.

CLERK of Works seeks re-engagement; just finishing public building; varied experience, notably ferro-concrete construction; well recommended; testimonials most excellent; age 45.—A. B., Box 4814, Builders' Journal Office

CONTRACTOR'S outdoor manager and surveyor desires engagement; present situation 17 years; age 37; keen on variations; expert in measurements; all trades, quantities, estimating; town or country.—W., 2, Dalberg Road, Brixton. 4776

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.

ENGINEER, general, wants permanent appointment, **official or private staff; thorough all-round** experience; **electrical, plumbing, smith, married,** 34; good **testimonials.—86, Bathurst Gardens,** Willesden. **4704**

ESTATE Owners.—Bricklayer, all-round, stone-waller, and general repairs; abstainer; good references; moderate wage for permanency.—Quinton, 12, Holland Road, Aston, Birmingham. 4802

FIREPROOF Engineers and Concrete Specialists. Advertiser, connected with above trades for 10 years, and whose name is well known in connection with same, desires position as manager, traveller, or head clerk; first-class book-keeper; aged 33; very moderate salary.—P. W. Potter, 73, Penshurst Road, Thornton Heath. 4719

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, Builders' Journal Office.

FOREMAN Painter (working) seeks re-engagement); experienced in all class work in building trade, as for general alterations, etc.; good supervisor, and reliable; either town or country; abstainer.—X. Y. Z., 8, Barton Street, Westminster. 4807

GENERAL Foreman seeks re-engagement, thoroughly practical in all branches; trade, carpenter and joiner, good draughtsman, first class references; town or country.—A. J., 196, Murchison Road, Leyton. 4804

GENERAL Foreman seeks re-engagement, town or country; thoroughly practical in all trades; energetic, reliable and good manager of men; good references.—E. C., 15, Park Road, Merton, S.W. 4778

GENERAL Foreman seeks re-engagement; alterations or new, practical experience in all branches; carpenter and joiner; good references; age 36; moderate wages.—Caplen, 3, Victoria Mansion, Edgware Road, Paddington, W. 4779

GENERAL Foreman seeks re-engagement, thoroughly practical and reliable; new or alterations; carpenter and joiner; life abstainer; first-class references.—Foreman, 3, Hawbridge Road, Leytonstone. 4787

HEATING.—Schemes, quantities and prices, tracing, workmen's sheets and costs; shorthand-typist (speeds 90/40); 5 years in Midlands; good refs.; disengaged.—Box 4834, Builders' Journal Office.

JUNIOR Assistant desires situation, home or abroad; good practical knowledge of construction and details; competent draughtsman and colourist, working drawings, measuring and supervising, surveying and levelling; moderate salary.—Box 4613, Builders' Journal Office.

PLUMBING, etc., Sanitary or Lead-laying, job wanted, day or piecework; anywhere; lowest prices; best work; excellent references; used to speculating or jobbing.—Squirrell, 47a, Woodland Street, Dalston, N.E. 4749

QUANTITY Surveyor's Assistant (21), 4 years' experience, desires engagement, certificates and good references. — Apply Box 4745, Builders' Journal Office.

QUANTITY Surveyor's Assistant, temporary assistance rendered in taking-off, measuring variations, land surveys, dilapidations, etc., by experienced surveyor; references. — Box 4808, Builders' Journal Office.

REINFORCED concrete foreman, disengaged, long and varied experience, especially in Kahn bars and expanded metal, timbering a speciality; carpenter by trade; good refs.—G. C., 59, University Road, Tooting, London. **4721**

R.I.B.A. Final Exam., 7 years' experience, 1½ in Paris; good all-round man requires berth at home or abroad; good refs.; salary moderate.—Box 4799, Builders' Journal Office.

SURVEYOR'S, Architect's Assistant (27), good varied architectural, municipal and engineering experience; contract drawings, details, assist quantities, surveys, levels, etc., houses, schools, works, sewage works, roads, etc. Salary £2 5s.—Box 4811, Builders' Journal Office.

SHOP or General Foreman, long West-end experience, used to alterations and repairs; understands stairs; used to good jobbing work. Address A., c/o Mr. Seymour, 14, Allsop Place, Regent's Park, N.W. 4586

SUN copies, tracings, and plans prepared.—Geo. Tune, Trevor, Llangollen, N. Wales. 4831

SHOP or general foreman, good draughtsman, good all-round experience, including reinforced concrete work; or as estate manager, preparing plans for same, etc.; country preferred. — "St. Osyth," Goldsworth Road, Woking, Surrey. 4829

TO Estate Owners, builder, experience, in all trades, desires position as manager (working or otherwise); plans prepared, quantities, setting out, accounts and supervision; abstainer; country preferred.—Box 4806, Builders' Journal Office.

VOLONTAIRE.—Foreign gentleman (21) desires position in builder's office, with opportunity of learning.—B. B., 43, Bolingbroke Grove, Wandsworth Common, S.W. 4789

Appointments Vacant.

ARTICLED Pupil, vacancy for same in an old-established architect's and quantity surveyor's office, on the South coast; trained under principals; moderate premium; part returned. A typewriter will receive greater consideration.—Apply Box 4822, Builders' Journal Office.

BUILDER'S Assistant for the Midlands. Must be a thoroughly competent man, smart and energetic, well up in supervision; measuring up, levelling surveying, and checking off sub-contractors. Send copies of three references, stating age and wages required for permanency to Box 4813, Builders' Journal Office.

JUNIOR Clerk for builder's office in North London, shorthand, typewriting, and accuracy in figures essential; early hours. — Box 4783, Builders' Journal Office.

REPRESENTATIVE Wanted by City Firm of Heating Engineers; must have connection amongst architects and practical knowledge of the business. Permanent situation with good salary to fully qualified man; state age and experience, with all particulars, to Box 4821, Builders' Journal Office.

WANTED, Traveller, to offer article in great demand for schools, hospitals, dwellings, specified by all eminent architects throughout the United Kingdom; commission. — "Sanatorium Iron Air Brick Co.," 58, Denmark Road, Southport. 4818

February 10. 1909. Volume 29. No. 6.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders - - - - - - 107, 108
Mr. Ernest George's Address to Students - 109
Notes on Competitions - - - - - - 112
The Town Hall, Harrismith, Natal - - 113

CONTRACTOR'S SECTION.

The Decay of Apprenticeship - - - - 115
Notes on Painting and Decorating - - - 116
Training School for Constructional Industries and Professions at Arcueil-Cachan, near Paris - - - - - - - - - 117
Some Recent Compensation Decisions - - 118
Birmingham Clerks of Works and Builders' Foremen's Association - - - - - 119
Proposed New Works - - - - - - - 120
Building in Mombasa. By A. G. H. Thatcher - 120
The National Federation of Building Trades' Employers of Great Britain and Ireland: Half-yearly General Meeting - - - 121
The Stability of Walls. By Henry Adams, M.Inst.C.E. - - - - - - - - 127
Trade and Craft - - - - - - - - 128
National Federation of Building Trades' Employers: Monthly Official Reports - 129-136
Complete List of Contracts Open - xxiii.-xxv.
Obituary - - - - - - - - - xxv.
New Municipal Works - - - - - - xxv.
Coming Events - - - - - - - xxv
Insurance - - - - - - - - - xxv.

ILLUSTRATIONS.

The Town Hall and Public Offices, Harrismith, Natal, Price and Agutter, Architects 109-112
Sun Insurance Office, Lowgate, Hull. B. S. Jacobs, F.R.I.B.A., Architect. 114; also Centre Plate.
Training School at Arcueil-Cachan - - 117-119
Building in Mombasa - - - - - - - 120
Sketches at the National Federation Meeting, by our Special Artist - - - - - - 123

School Architecture. The paper on the planning of schools, which was read last Friday by Mr. H. T. Buckland to the Architectural Association, is certainly a most valuable contribution to a subject of perennial and ever-increasing importance. It is a mere truism to say that the influence of the school building upon national life and character is so potent as to demand the utmost skill and care as to site, planning, sanitation, ventilation, and appearance. Mr Buckland has given to all these matters, and to some others, the most thoughtful and studious attention. But, as Mr. T. J. Bailey, the education architect to the London County Council, has pointed out, Mr. Buckland has not dealt with schools of the higher elementary type, nor with the special requirements of schools for the mentally and physically defective. Seeing the length of the paper as it stands, one is by no means surprised at the omission. Mr. Bailey's very welcome appearance on the scene reminds us of the splendid work he has done during his long tenure of office, and makes us hesitate to make a comment that suggested itself whilst we were listening to Mr. Buckland's paper. But, in a matter of national importance, merely personal consideration should not be allowed to stifle honest opinion. We, therefore, feel compelled to reiterate what we have found occasion to say before with respect to official architecture. We do not think that the best interests of architecture are served in the best way when all the schools of a great city are stamped with the individuality of one man. The Council schools of London, which meet the eye at every turn, are a case in point. Even if they were beautiful exceedingly, their monotonous style would be extremely wearisome. But we do not think them beautiful, although it must be admitted that they might have been much worse. On the other hand, they might at least have some diversity of elevation. Not that they are all exactly alike; but they all, or nearly all, show the impress of the same mind. From such deadly uniformity there is but one way of escape. The work should be thrown open to competition The educational authority would still need its official architect, but his function would be mainly advisory. His advice would be invaluable, because his position and experience afford him unequalled opportunities of becoming an expert specialist in the essential requirements of this class of building. He would provide in the recognised way for every detail that tended to the health, comfort, and convenience of teachers and pupils; but the designs would show more originality and variety than could be expected from any one man, however versatile his gifts. London being hopelessly committed to the single-mind policy, our contention applies more forcibly to other parts of the kingdom, whose educational activity is only just beginning to find concrete expression. A school should teach by its exterior something of the dignity and amenity of knowledge, and it is only in open competition that the realisation of this ideal can be approximated in any given instance. Without the slightest disparagement to the London County Council educational architecture department—which, by the way, has just been reorganised without giving effect to our contention—it may be said that those provincial authorities that have anticipated the course we advocate, have chosen the more excellent way.

Conciliation and Disaffection. It is somewhat surprising to notice, from the reports of the proceedings at the annual meeting of the National Federation of Building Trades Employers, that, dissatisfied with certain results of Conciliation Board voting, one or two associations have apparently threatened to sever their connection with the parent body. Taking an entirely independent view of the situation, we suggest that such an extreme course is unwise and unnecessary. The Conciliation Board is a comparatively novel institution, and a perfect machine, if attainable at all, can only be evolved experimentally. Still, whatever its present shortcomings, and whatever imperfections it may happen to share in common with the highest legally-constituted tribunals, which, in spite of every precaution that the wit of man can devise, are unable to prevent an occasional miscarriage of justice, the Conciliation Board—we are referring to no special Board, but to the institution—has been, on the whole. amazingly successful. It has succeeded beyond the most sanguine anticipation in the difficult task of suppressing industrial strife. It has finely vindicated an excellent principle, and has completely justified its existence. Any premature action, therefore, which may tend to weaken its influence and authority, can only be regarded as extremely regrettable, and we can only suppose that the threats to forsake it must have been prompted by momentary disappointment with unexpected decisions, and are therefore not to be taken too seriously. The disaffected members will best serve their own individual interests, as well as those of the entire trade, by yielding loyal support to a principle that is unassailable, and to an organisation that, being of human invention, is certainly liable to error, but has, nevertheless, proved itself invaluable and indispensable; and it especially behoves employers to set an example to the workmen in the noble art of playing the game, even when it goes somewhat arbitrarily against one's own side. No committee is infallible.

Architectural Stimulus. Very few men whose knowledge of the past is at all comparable to that of Mr. W. R. Lethaby have anything like his felicity in turning it to practical account. Of this happy union of talents a further example was given last week, when Mr. Lethaby delivered, at the Midland Institute, Birmingham, an inspiriting lecture on "Local Patriotism and Art Production." The magnificence of ancient cities, he supposed, arose from the keen artistic rivalry between them, and the same competitive spirit gave us our finest early ecclesiastical buildings. Local patriotism —pride in one's own city—found expression in art and architecture. But the lecturer seems to imply that nowadays we have become too cosmopolitan to be very sensitive to the stimulus of local patriotism. "By the great centralisation which had taken place in London, not only had county capitals and the big towns ceased to compete with her; but London herself, no longer conscious of the rivalry of Edinburgh, Dublin, York, and Bristol, had fallen into gross slackness and slatternliness." The theory of excellence through emulation is doubtless sound enough; and, indeed, the principle would seem to be vital and fundamental. That it has lanquished from the causes and to the extent suggested by the lecturer is open to question. When London was comparatively small and insignificant, the county towns were too remote from it to think of competing with it. Travelling by pack-horse did not afford sufficient opportunities of comparison to stir up emulousness. The rivalry was between near neighbours, as the lecturer himself indicated when he remarked that "the foundations of the old cathedral at Coventry were enough to show that there was rivalry with Lichfield, and that one imitated the other." London itself, one can easily imagine, is more concerned in rivalling the Continental capitals; who, in their turn, are more strongly impressed with what London can show of grandeur than with its "gross slackness and slatternliness." This rhetorical expression might be more justly applied to Paris, whose municipal councillors, on their last visit, were as much struck by the tidiness of the London streets as by the dignity of the buildings. In these respects they are determined to rival us, and some of the English visitors to the International Congress of Architects held in Vienna last year seem to think that Baroque and beauty are synonymous terms. It would seem probable, therefore, that the modern facilities for travel and intercommunication are not wholly antagonistic to emulation, although they may possibly tend to the destruction of local feeling and character, as well as to the correction of insular prejudice. It is difficult to believe that larger knowledge, a wider field for comparison, and a better understanding and appreciation of the work of our neighbours are incompatible with the "love of home, love of city, and love of country," that, as Mr. Lethaby maintains, form the groundwork of the patriotism that he supposes to be so potent in the promotion of worthy architecture. Mr. Lethaby thinks that the present obliviousness to beauty is largely a result of the sudden expansion in our towns which followed on the introduction of railways, and he hopes that the "period of rapid swelling" will be followed by an "era of tidying-up, smoothing-out, and letting-in of sweetness and of light." Our railways, indeed, have much to answer for, particularly with regard to their stations, which not only tally too faithfully with his description of them as "colossal advertisement sheds, dirty, shabby, and irritating," but also have a blighting influence on the districts they disfigure. Their utter inferiority to Continental and American stations is a proof that in this direction international emulation has failed us. Our railway magnates lay too much stress on engineering, and too little on architecture; and they possess so much power that it is almost beyond hope that they will be bound by the sweet influence of the Town Planning Bill to show some regard for decency, if not for beauty.

The Bad By-law and the Defiant Duke.

Although in the main, we Britons doubtless deserve our reputation as a law-abiding people, it must be admitted that there are circumstances in which we hail with satisfaction and delight some instance of the breaking of the law. Hence, perhaps, the enormous popularity, some few years ago, of a picture, entitled "Defying the Law," in which was seen the heroic figure of a John Bull-like country gentleman who, ebullient with (doubtless) righteous indignation, stood at the top of a flight of steps, at the bottom of which, in picturesque confusion, were huddled the bodies of two "fired-out" process-servers. Popular sympathy was with the law-breaker—the honestly irate gentleman who had, as it were "taken the law into his own hands," and unceremoniously kicked it down the steps. As with the law, so with the by-law. There seems to be a popular impression that a bad by-law should be more honoured in the breach than in the observance. When Judge Grantham defied the Chailey Council and all its works, he became for the nonce a popular hero. The popular feeling seems to be that it is a meritorious action to break a by-law when you want to see it mended. This is the course that has been taken by the Duke of Northumberland. He was summoned by the Hexham Rural District Council for a breach of their by-laws "by erecting a new building at Barrasford of wood instead of brick, stone, or other hard or incombustible material." The Duke "deliberately, and in defiance of the by-laws, was found, in March of last year, to be erecting a building which was in substance a wooden erection." It was a wooden structure—a fish-hatchery—lined with asbestos. The defence was that the Duke took his stand as a matter of principle. He wanted to make it perfectly clear that the Council were applying the wrong by-laws. They were attempting to enforce, in a rural district, the by-laws that, in 1875, were made by the Local Government Board with an eye to the requirements of urban districts. Defendant's counsel agreed that, in the circumstances, the authority had no option but to proceed against the Duke, who, however, was determined to make it quite clear that the Council had the right to adopt other and more appropriate by-laws, such as were applicable to rural or semi-rural parishes. Probably the Duke expected to smart for his temerity, and no doubt he was prepared to suffer in so good a cause. If so, he perhaps found the result rather disappointingly tame. Once again were the uncertainties of the law made manifest. The Duke got off scot-free. The chairman of the Bench "intimated that they had very carefully considered the case, and, under the very exceptional circumstances, they had decided to dismiss it." Now, bad and antiquated by-laws are by no means peculiar to Hexham; but the Duke's example should not be followed, either there, or elsewhere, by mere commoners. There's a divinity doth hedge a Duke, and builders who happen to fall below that rank cannot confidently reckon that the precedent set by the Hexham Bench will be invariably followed. Where the by-laws are bad, the builders should combine to get them altered by less dramatic but more constitutional means.

Winchester Cathedral.

It appears from the latest report upon Winchester Cathedral, presented by Mr. T. G. Jackson, R.A., that the faults and weaknesses brought to light as the work of reparation advanced, will require the expenditure of a total of £99,000 to ensure the safety of the fabric. Thus to stop short of the century of thousands is, perhaps, an evidence of careful estimating, but, even so, it is, in Shylock's phrase, "a good round sum." As the amount realised by public subscription always seems to fall short of the actual amount required, and as we may not even yet have reached finality with regard to the defects, it might have been well to make a bolder appeal, on the principle that "he who shoots at the moon o'ertops the highest tree," and this continuous asking for yet a little more may ultimately find the public weary and unresponsive. This would be a thousand pities; for there is surely no building in England that is better worth preserving than Winchester—except, perhaps, Canterbury, which seems, indeed, to rival Winchester at every point—in the splendour of its beauty and of its beggary, and especially in the insecurity of its foundations: in which respect, however, the doubtful honours are with Winchester, since it has not yet been found necessary to employ divers at Canterbury. The methods of the old builders are instructively exposed by Mr. Jackson, who, in his report, makes the following interesting and rather startling statement: "The floor of the Lady Chapel (of Winchester Cathedral) had sunk owing to the giving way of the columns and vaulting below. When the easternmost column in the crypt had been collared and taken out it was found that it had crushed its base, which was broken in pieces, the middle having sunk, and the four corners being tilted upwards. Below was discovered a great wooden pile, 15 in. in diameter, on the head of which the column rested; and as the wood was so rotten that it could be cut with a spade, the subsidence of the vault was sufficiently accounted for. The column was re-set on a new pier of concrete and brickwork, resting on the gravel about 17 ft. below the outside ground. The second was afterwards underpinned also. The whole of the crypt vaulting had been disturbed by the movement of the walls; it has now been repaired by grouting and bonding—a very long and tedious operation." Well is it that the reparation has been entrusted to such capable hands, and we can only hope that Mr. Jackson will not be hampered in his good work by stinting of the necessary funds.

Unfair Contracts.

We are glad to see that the question of the unfair contract conditions imposed by public bodies, to which we drew attention in a recent issue, has been taken up very vigorously by the local press. It will be remembered that the Official Receiver in the course of a case that came before him in the Newcastle Bankruptcy Court, made some scathing observations on a form of contract which he described as "absolutely confiscatory." Taking up this parable, the "Shields Daily Gazette" makes the following observations: "It is the custom for a council to guard itself against any failure or possible defects by a particular form of contract that is all in its favour and all against the other side. It is a form, it is true, that has official sanction, but its adoption is not compulsory. Under the Local Government Act of 1894, a desire was shown to protect the interests of District Councils in every possible way, and it certainly cannot be charged against this contract form that it errs on the side of leniency. . . . . This particular agreement provides that, in the event of delay or failure to complete, the contract becomes void at the option of the Council and the amount then already paid to the contractor by the Council 'shall be deemed to be the full value or price of such work as shall have been executed and such materials as shall have been supplied by the contractor up to the time when such notice (seven days) shall have expired, and no further claim shall be made by the contractor under these presents in respect of the works or any part thereof.' Delay in completion means that the contractor must pay 10s. per day, and if there is default, a sum of £200 'as and for liquidated damages for breach of this contract.' . . . In the case of the small contractor it is easy to be seen that the result might be disastrous, and that his failure might reflect to a more or less serious extent on others. It is not suggested that the Haltwhistle Council applied the screw with undue force. The purpose here—as we take it the Official Receiver's purpose was too—is to call attention to the possibilities for evil of the system, because it is one that causes others to suffer in addition to those immediately concerned."

MR. ERNEST GEORGE'S ADDRESS TO STUDENTS.*

It is my privilege to-night to address our future architects, our students, may I say my fellow-students of architecture?—for the study of the great art is not accomplished in a lifetime. The young, however, have a capacity for learning and assimilating when the old have got into ruts and have acquired prejudices that hinder the reception of new impressions.

I speak to you who have the responsibility of remodelling our cities and of making the world that is to be, I trust with a great increase to its beauty. An artist paints his picture, and if it fails it can be obliterated, or if it has meretricious cleverness it endures for a time, but when found out its place need know it no more. In the art of building the case is more serious; what we build must be seen whether we will or no; it has its influence on the "man in the street." It may be a source of pleasure, or it may cause familiarity with and toleration of that which is bad.

Architects Must be Builders.

As architects it is a first necessity that we should be *builders*, for the arts of building and of architecture cannot be separated. The simplest structure may attain to architecture by admirable proportion and by a wise disposition of the parts; whether decoration comes in or not is of secondary importance. The question of style is a minor matter, for the artist's hand will be evident in the work, whatever the treatment he affects or the vogue of his time.

The education of the architect has been taken seriously of late, and his facilities for study are greater than ever before. I will not discuss the details of the training of which you have the advantage, but with it all I would say that what you do earnestly for yourselves is worth more than all that your able professors can do for you. They will endeavour to put you on the right path and to inculcate the principles, but it remains for you to give them practical application.

Much has been said about technical training, with the study and handling of material; and it would be all to the advantage of the architect that he should be a good joiner, mason, or worker in metal. When drawing a moulding he should have stone, oak, or plaster in his mind. He has so many good books of "Examples" now that he is apt to become a paper architect, losing familiarity and touch with the realities of building. Modelling is a useful accomplishment, and should be part of the training: it aids in the expression of ideas where the pencil often fails. The architect has, however, in the few years that can be given to preparation, so much to acquire that he can hardly spare time to grow efficient in the various crafts. Some have found practical knowledge by a term in a builder's yard, and I think I am right in saying that this was the early training of John F. Bentley, whose architecture gives evidence of his knowledge as a masterful constructor. Still, a boy must leave school prematurely and in a half-baked condition if he seeks apprenticeship to the crafts, and it is difficult to say at what age general education should give place to specialising.

Dr. Christopher Wren.

The greatest architect that England has produced was known only as a man of science and a professor of astronomy until the age of thirty, when the resources of his great mind were turned to the art of building, at which he presently showed himself an accomplished artist. Notwithstanding this late start in life, Dr. Christopher Wren was allotted sixty years in which to build our Cathedral, rebuild our City, and raise the many monuments that he has left to us as a precious heritage.

With the rudiments of scheming and planning, freehand drawing must be cultivated; and working from the cast and from the figure is perhaps the best training for the eye and for the hand, while it teaches a sense of proportion.

No work is more profitable than the measuring and careful study of existing buildings, making choice of fine specimens, and I am pleased to state that suggestions and directions for the guidance of students will shortly be published by the Institute in pamphlet form, giving a list of examples throughout the country that are considered most useful for study, also specifying those which will be valued as an addition to our architectural records. Those of you who go out with our scholarships, instead of sketching in a desultory way, will be advised to study seriously some building of distinct architectural merit, and it is intended that the result shall be published in some permanent form. It should add to the student's zeal and interest if he feels that he is thus contributing to the world's store of knowledge. See what details and mouldings give the strength and the quality that you admire; note their size and projection, but, doing this, show also their place on the building. Note-books are sometimes filled with interesting doorways or windows, without a record of their relation to one another or to the wall-spaces that give them value. Study critically the buildings that impress you as fine; find out where and why they are good. It is a curious thing that criticism has come to mean exposing the faults; that is the easier and the more telling form, but it is a bad spirit to adopt. I have often been shocked at the flippant criticism by mediocre men of fine work of which they would themselves be quite incapable. The faults they see probably exist, but the quality and essence of the building are not in those imperfections. Make mental notes, if you will, of ways that you feel should be avoided,

---

*Delivered by the President, Mr. Ernest George (Royal Gold Medallist, 1896), at the General Meeting, February 1st, 1909.

THE TOWN HALL AND PUBLIC OFFICES, HARRISMITH, NATAL. PRICE AND AGUTTER, ARCHITECTS.

but seek the good first; it is the more profitable study.

As architects you will often be asked what you think of this man or that; perhaps you do not feel the architect in question to be one of our great lights. Let me beg of you to stretch a point and say all that is generous, though perhaps of a rival. It is unsportsmanlike to give away a professional brother or to damn him with faint praise. His reputation is his stock-in-trade. Let us among ourselves use all frankness: it is helpful to have our weaknesses pointed out if we are wise enough to profit thereby.

Nimble Draughtsmanship.

We have had so much of draughtsmanship, sometimes with very little behind it, that great facility has got rather into disrepute. The mind is sometimes better employed when the fingers are not too nimble; nevertheless the power to draw and to express your ideas with the pencil is one of the happiest endowments of the architect, and should be assiduously cultivated. There should be a careful avoidance of tricky methods, for we have seen drawings so pretty in themselves that the absence of good design is overlooked; the drawing is looked upon as an end, instead of being a simple medium or a diagram of the proposed building.

It is curious to look back on the fashions that have prevailed in my own time. When I was a pupil most perspectives were coloured, and there was a small income for many who were adepts at a skilful throwing-on of colour; then George Street, Norman Shaw, and Eden Nesfield showed how much of the real qualities of a building could be expressed by line. One incident of the time was the discovery that one of these masters used a notched straight-edge, thereby admirably rendering the texture of roofs. I confess to having sacrificed a T-square myself in that cause. Light and shade, whether with line or the brush, are desirable to explain fairly the shape of a building. There was a pretty and telling way of leaving roofs and spaces white, as if under snow, with strong black touches here and there, the result being effective but not a fair rendering of the future structure. In one of my wanderings I met a nice young man who proposed making a study of art; I am not sure that he could draw, but he was interested in some blue and red chalk with which he touched in passages of his work: he found this treatment in the studies of the Old Masters to which he desired his sketches should approximate. If you have the power of drawing, it matters very little by what vehicle your thoughts are told, and all tricks are a hindrance to truthful expression. A method that obtained lately among the younger students was that of running the lines out beyond their natural limit, thus giving to a cornice or a stringcourse an unreal weight and importance instead of defining its contour. This may look brisk and sketchy, but a student's time is not very valuable, and a further half hour would be well spent in making the drawing correctly explain its parts. Do not be afraid of being methodical and exact, rather than sketchy. Nothing is more offensive than "sketchy" passages from a hand without the artist's mind, impressionism which is only scribble.

Bushy-haired Bohemianism.

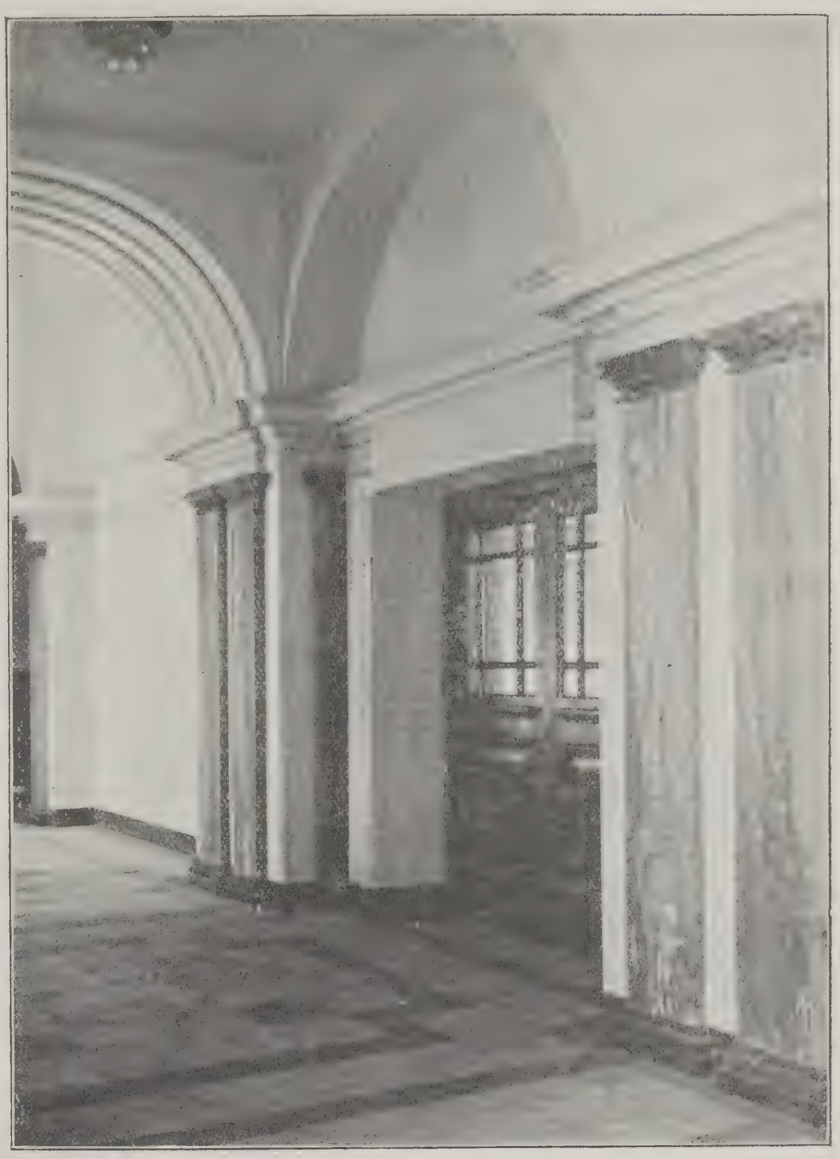
Fortunately Bohemianism has ceased to be a distinguishing mark of the student, for I can remember when nearly every Academy student wore long bushy hair; I am not sure whether I did so myself; I could have done so then. I see among you now men of fashion, with the greatest correctness of costume. Still I would say to the serious student do not be so beautifully dressed that you cannot carry a sketchbook or a two-foot rule in your pocket. You should be so far ready for work that the eight o'clock dinner, for which you must dress, is not always imperative. Michael Angelo, during a fifteen hours' spell of work, was content to munch bread; he slept little, finding that sleep made his head ache; he said that though he had made himself rich by his work he had lived always as a poor man. We may not all, like this giant, bring the mind to dominate the body, but I am sure that simplicity of life is to be aimed at by the true artist. You are fortunate in having your great interest in life; you have no need of the expensive pleasures or distractions that save the gilded youth from being bored. Much good work has been done in a garret, and I believe that the admirably appointed young man finds it less easy to throw his soul into his work than does one to whom Art is the companion and solace. I would not have the artist a drudge; variety, good company, and recreation are necessary if the work is to be a pleasure. It is essential also to move among men and to make good friends, for it is no use being a good architect if you have not a client to bring the work. Accept week-end invitations—and, if you can, interest your host in a clever suggestion for altering and beautifying his place.

I hope with most of you that your art is sufficiently interesting to be the purpose of a holiday, whether in getting away on a Saturday or taking ten days in Brittany. They will tell you that you want relaxation from work—golf, perhaps, or a lounge in a house-boat. From my own experience I would say there is more change of thought and of interest for the mind in seeing and assimilating fine things, living out of doors all day, sketching and measuring with a change of scene, of climate, diet, and language. Our own beautiful country will supply matter enough for study, but crossing the Channel I have found to make a more complete break with the life of the office.

The Disciples of Norman Shaw.

I suppose, without question, in the period that my memory covers, Mr. Norman Shaw has been the most followed, I might say the most copied, through the successive phases of his work; for the strongest men will always have a large following of those who imitate their manner. I value to this day the several books I managed to buy out of my youthful allowance, and among these are the sketches of Shaw and Nesfield. In

THE TOWN HALL, HARRISMITH, NATAL. PART OF THE GRAND STAIRCASE
PRICE AND AGUTTER, ARCHITECTS.



THE TOWN HALL, HARRISMITH, NATAL. THE CRUSH HALL AND ENTRANCE TO MAIN HALL, PRICE AND AGUTTER, ARCHITECTS.

their exposition of the architecture of France the examples chosen are all Mediæval, later work was not accounted of in those days.

Waves of Fashion.

I remember, in my own early visits to France and Spain, regarding the Renaissance screens in the churches as wicked innovations, although fascinated by them against my judgment. A chateau of Louis Douze or of Francois Premier was a rich find, while a work by Mansard or Vanburgh we counted ponderous and dull. By common consent we now seek the more formal examples of buildings, and what was once dull we find dignified and restrained; while some will tell us that the quaintly picturesque, our first love, is hardly to be taken seriously as architecture. Unquestionably the student should study the purer classical works, rather than the picturesque Jacobean or Dutch versions, or perversions, of the same. There was an earnest attempt to gather up the traditions that were snapped in Tudor times; now the prevailing desire is to revive the later methods that had become traditional here until the advent of chaos; and in this last is our best chance of arriving at a happy unity of aim.

We may be disturbed again by waves of fashion, for no arbitrary law exists in matters of taste. There are Eastern races with a really fine sense of beauty, as shown in their splendid arrangements of colour and in their gorgeous stuffs; yet, among these, a lady can make no claim to beauty unless she is fat. Our standard differs from theirs and our taste is more catholic; yet it is difficult even for the most cultivated to keep an open mind for the appreciation of what is fine if it is not in vogue.

It is unnecessary to insist on the advantage of wide knowledge and of general culture. Avoiding the purely archæological spirit, History is perhaps the most interesting subject and the most sympathetic with our central thought or study. The world's history is written in its architecture, and it is a part of our schooling to follow the developments and to trace the growth of the various methods of styles, noting the influence of one country or people upon another. Our interest is less in the names or in the characters and peculiarities of kings than in the work that was accomplished in given periods and in the great masters of the Arts that such periods produced. If a name or a date is mentioned, we can localise it by calling up the Byzantine, Mediæval, or Renaissance environment of the subject; it makes the past very real to us. The knowledge of foreign tongues is an invaluable aid to the architect. Through my own indolence in acquiring or in keeping up my knowledge of these many precious books are closed to me; while in travelling one is often surrounded by people with whom the exchange of ideas and even the gentle amenities of life are difficult.

Niceties of the Notebook.

I have spoken of the study of fine buildings and of the use and misuse of the notebook, which we like to bring home full of pretty things. In our search for the latter we may possibly miss what is noblest in architecture. The sublime is not readily transferred to the sketch-book; it is no use making picturesque jottings of the Parthenon or the Pantheon. Those who have great facility with the pencil find less effort in the use of the fingers than in the exercise of the mind.

Drawing, to which I give a high place, may at any time become a snare, being made a substitute for contemplation and analytical thought, the seeking out of a reason for the forms we see, learning whether they were determined by the necessities of construction or were evolved as a part of a beautiful composition.

My fellow-workers may expect of me some remarks about water-colour sketching, which has always been my happiest recreation. Under favourable conditions of climate, with a sympathetic friend, a day spent with the brush in a spot selected for its beauty is as good a time as I can well imagine. The travelling student may wisely turn to brushwork for relaxation from the more exacting forms of study. We architects do not sufficiently consider the value of colour. We think of form, and perhaps light and shadow; too often conceiving a scheme in elevation only. One who paints must consider buildings in perspective, also taking account of their colour and their relation to surroundings. Yet of the student who is good enough to obtain an architectural prize from the Royal Academy or from our Royal Institute I would beg that he stick to his trade. Let him not, because he finds that he can paint pleasantly, throw architecture aside, however great the difficulties to be faced, before palaces or cathedrals are entrusted to him.

What of Photography.

I have spoken of drawing and painting: what shall one say of photography? The art, or shall we say the science, brings to the eye all that is finest from all parts of the world—Indian temples, Venetian palaces, Eastern minarets, the sculptured doorways of great cathedrals, and these often taken with judicious lighting. By photographs or photo-prints memories of the world-treasures are brought to the armchair. As affects the student this is a doubtful advantage; that which he attains without effort is hardly a possession; he had better worry himself for hours making an indifferent drawing than secure the best of photographs or of book illustrations of his subject.

In the last few years choice books have been added to our architectural libraries: the subjects, admirably selected by men of judgment, especially setting forth the beautiful houses throughout our own country. These we value while urging the student not to misuse them or make them an excuse for shirking the prosaic work of measurement and personal study; he is apt to be distracted by the quantity of material ready to hand and the many inventions presented to him, hardly leaving him the chance of originating. There is also the handy "kodak," by means of which he could snapshot that which would take a day to draw. We accept these things with our advanced civilisation, while we question if art is advanced by photography any more than music by the marvellous gramophone.

Study and the Application.

We have discussed the methods of study; how can the acquired knowledge best be applied or tested? I think there is no more useful exercise than to enter heartily into these competitions for medals and prizes. Doing so you are for the time being the architect to a palace or some monumental work with grandeur and scale to which you may perhaps never have the chance of building; but whether the prize falls to you or another, the benefit of the effort remains yours. Again, a little later, you begin for yourselves, and confiding relations entrust you with an additional wing, stables, or a motor-house. Your time is not filled up as it should be, and it is worth your while to take your two-hundredth chance in competition for the exercise of your imagination, and powers of design; it is valuable training. The open competition is a quite unreasonable venture if looked upon in any other light than this; a multitude doing the work for which one only is commissioned.

The Prize Drawings.

This evening is the first occasion on which the prize drawings have been with us during the address to students and the review of their works; a discriminating friend will presently discuss the latter critically and in detail. [See Mr. Waterhouse's criticism in last week's Journal.] I will only say that the competitive drawings reach a higher level this year. Some of those that escape mention might have carried off a prize in some previous competitions. There is not only good draughtsmanship, but in some cases evidence of design and composition, with an effort towards the "grand manner."

As we have said, there are fashions in our art and they influence the student. It is interesting to note that whatever the subject set, whether the "Landing Stage," the "Corridor of Shops," or the "Pavilion," a dome of noble span is a leading element in the designs. Perhaps domes may become features in the architecture of the future; during my own career I have not been allowed the opportunity of raising a dome.

We have discussed methods of study and modes of working and drawing, but we must keep well in mind that these are but preliminary steps and stages. Looking on our great Cathedrals and the noble monuments of the past, we must remember how little they owe to draughtsmanship. No beautiful drawings, such as we see to-night, preceded the building of Westminster Abbey. The master mason chalked out indications of what was to be, and such lines were followed with more or less accuracy, slight inequalities giving a charm to the whole. It is pleasant to come upon elevations or studies for buildings by the great masters, but these, as drawings, would not pass muster with those before us to-night. We judge the embryo architect by his drawings, and it is generally a fair test of his worth. Yet we would remind him that to use art and science in Building is his vocation, and there is none higher.

A poet has said:—

To build! to build!
That is the noblest art of all the arts.
Painting and sculpture are but images,
Are merely shadows cast by outward things
On stone or canvas, having in themselves
No separate existence. Architecture
Existing in itself, and not in seeming
A something it is not, surpasses them
As substance shadow.

Our Plate.

Banking and insurance corporations provide our towns with their most strikingly handsome and sumptuous buildings, and the Sun Insurance Office, Lowgate, Hull, shown in our centre plate, does not fall short of that description. If it is thought that the elevation is somewhat bold and aggressive, it must not be forgotten that, after all, business premises should not err on the side of shrinking modesty. Mr. Jacobs has at all events produced a handsome and striking front, and this effect is obtained without excessive elaboration of detail.

After a heated discussion, the United States National Board of Trade has appointed a special committee to urge Mr. Root, Secretary of State, to incorporate in any treaty the Government might be about to conclude with Great Britain some provision for the protection of American patent rights. A deputation from the Board has called at the State Department last Thursday to protest against the British Patent Law, and was informed by Mr. Bacon, Assistant-Secretary of State, that the matter would be referred to the House of Representatives' Committee on Ways and Means.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Feb. 20	GUILDFORD. Footbridge over the River Wey. Designs are invited for a light footbridge in oak or other materials. Particulars from C. G. Mason, C.E., Tuns Gate, Guildford. Designs to be sent to W. Shawcross, Hon. Sec., 108, High Street, Guildford.
Feb. 20.	PENCLAWDD (WALES). Chapel. Plans are invited for a new chapel to contain 800 seatings. Approximate cost of chapel, including heating and acetylene lighting apparatus, £3,000. Premium—five guineas to the architect whose plan *the Committee may select.* Plans to be deposited with John Rees, Secretary, Penian, Penclawdd, S.O.
Mar. 1.	TORRINGTON (DEVON) Memorial Cross. The Committee of the Rolle Memorial invite designs for a memorial cross (preferably of granite), to be erected in the churchyard, Torrington. Cost, inclusive of erection, &c., not to exceed £100. Premium £2 2s. for the selected design, but no other charge or expense. Particulars from George M. Doe, Town Clerk, to whom designs are to be sent.
Mar. 8.	*PONTARDAWE (WALES). Offices for the Guardians, in Holly Street. Premium £10 10s. The premium is offered by the Guardians "for plans with abridged specification, *which in their judgment* are best suited." Particulars and conditions from C. B. Jenkins, Clerk, Herbert Chambers, Pontardawe, S.O., Glamorganshire.
Mar. 17	†NEW OFFICES FOR THE STANLEY U.D.C., DURHAM. Cost £3,500. Premiums £30, £20 and £10. Conditions, etc., to be obtained from J. G. Ridley, Clerk to the Council. Stanley S.O., Co. Durham.
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days.
No date.	BLACKBURN. The Blackburn Small Holdings and Allotments Committee have decided to invite architects and surveyors in the Borough to submit competitive plans for the laying-out of the estate at Oswaldtwistle, recently purchased for small holdings. Premiums of £25, £10, and £5 are offered.

*We are advised by Mr. Jenkins that the supply of particulars and sketch plans is exhausted and no further applications can be entertained.

†The Royal Institute advises members not to compete.

Offices for the Stanley U.D. Council, Durham.

Messrs. Speir and Beavan, of Cardiff, have forwarded to us the following further correspondence concerning the above, which we think requires no comment:—

Mr. Joseph Routledge,
Surveyor,
Council Offices, Stanley,
County Durham.

New Council Offices.

January 29, 1909.

Dear Sir,—We are obliged for yours of 28th inst. in reply to ours.

We shall not, of course, compete, neither do we think you are likely to obtain designs from any architects of standing with the conditions you issue.

Yours faithfully,
SPEIR and BEAVAN.

Stanley R.S.O.,
County Durham,
January 30, 1909.

Messrs. Speir and Beavan,
Architects, etc.

Re New Council Offices.

Gentlemen,—I beg to say in reply to yours of the 29th inst. that we have no less than sixty architects, who have paid their £1, and got the block plan of the site, and out of the society there are some of the best architects in the north and south of England, and some of them members of the Royal Institute of British Architects.

Yours faithfully,
JOS. ROUTLEDGE,
Borough Chambers,
Wharton Street, Cardiff.

THE TOWN HALL, HARRISMITH, NATAL. PRINCIPAL ENTRANCE. PRICE AND AGUTTER, ARCHITECTS.

Blackpool Central Library.

Mr. G. H. Willoughby, F.R.I.B.A., of Manchester, the assessor, has delivered his award in the above competition, as follows: First: Messrs. Alexander Cullen, Lockhead and Brown, Glasgow. Second: Messrs. Russell and Cooper, London, W.C.; Messrs. Thompson and Bristow, Stamford Hill, London; Messrs. Cooper and Slater, Blackburn; Mr. C. H. Potter, Manchester; Mr. H. R. Gardner, Leatherhead. One hundred and forty-two designs were sent in. The assessor suggests that the whole of the premium money, 100 guineas, should be disbursed equally among the five designs next in order of merit to that placed first, and recommends that the authors of the first-placed design be entrusted with the work. The Free Libraries Committee have agreed to these recommendations.

Cornwall County Offices, Truro.

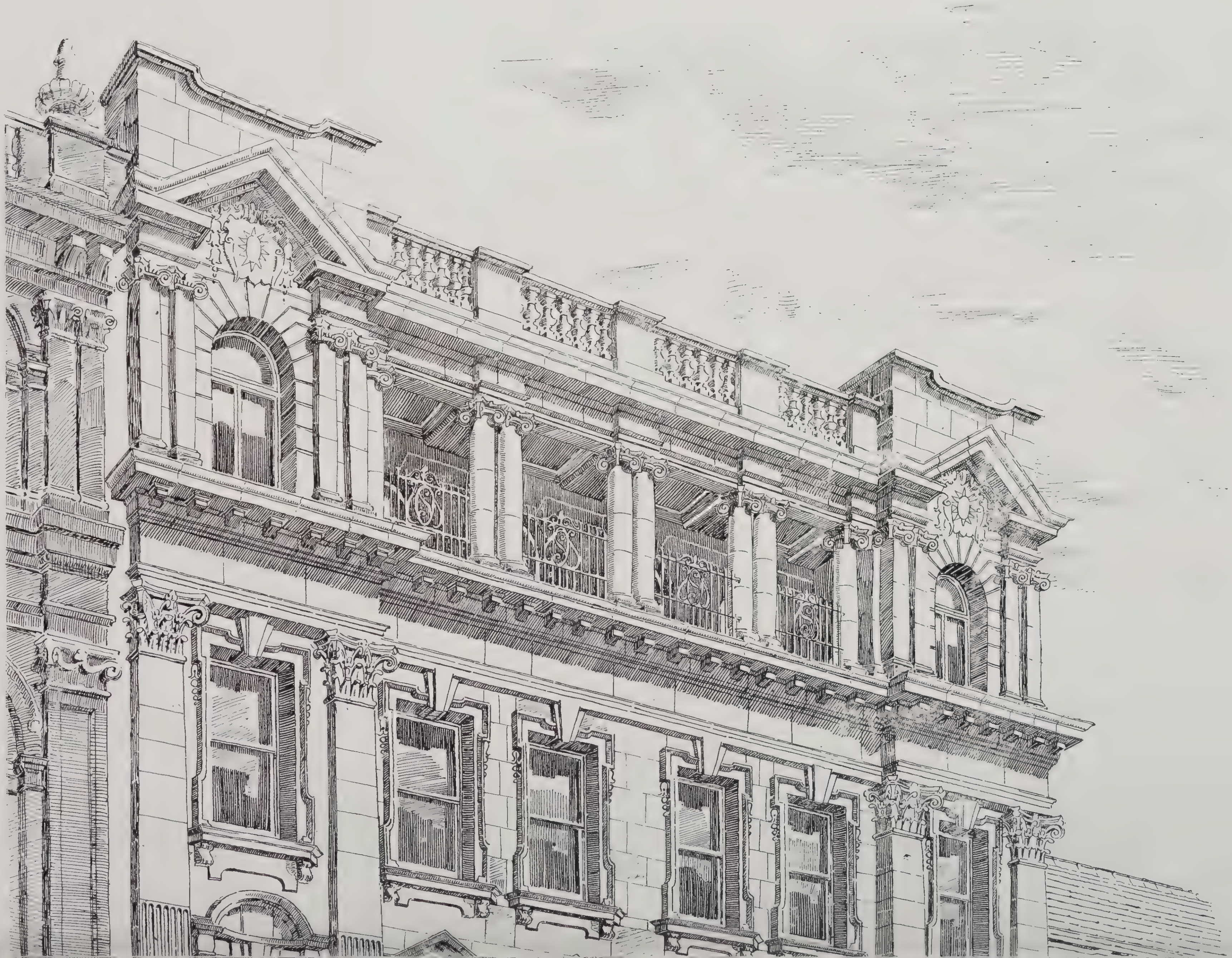
Mr. Fellowes Prynne, F.R.I.B.A., has delivered his award in the above competition as follows:—

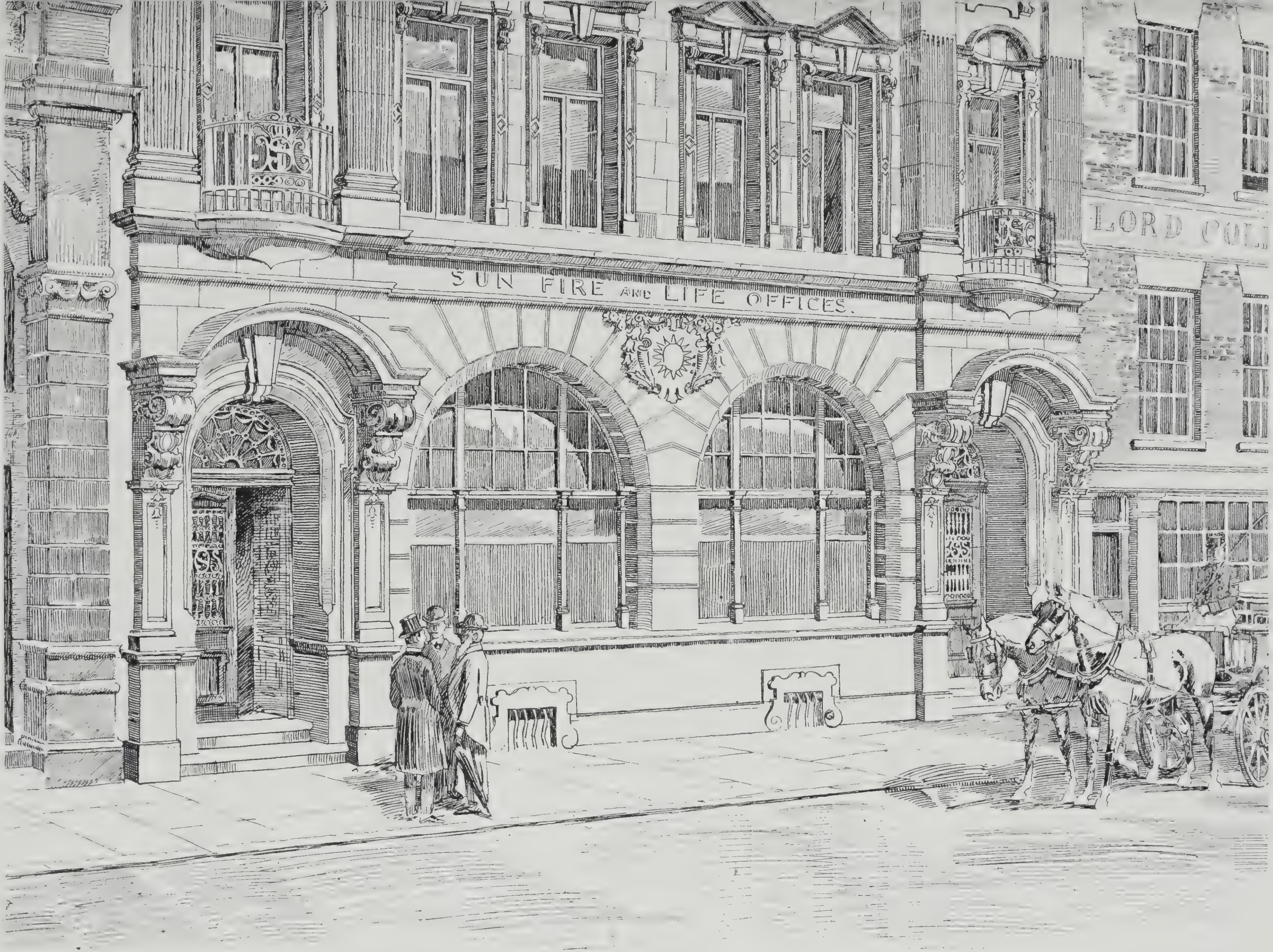
1. Messrs. Silcock and Reay, Bath.
2. Messrs. Pearson and Milburn, London.
3. Messrs. Warwick and Hall, London.

We take the following particulars from the meeting of the Council reported in the "Western Morning News." In regard to the proposed new county offices, Mr. Fellowes Prynne, the assessor, reported that he had made a careful inspection of all the 59 sets of plans. In view of the unfortunate conditions in the particulars sent to the competitors, there was a very large divergence, both as regards the extent of the plans and the character of the designs generally. Consequently, the variations in the estimated cost was very large, and for that reason the work of the assessor became far more difficult and complicated. The variations between the lowest and highest estimates

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Supplement to The Builders' Journal and Architectural Engineer *Wednesday, February 10th, 1909.*




SUN FIRE AND LIFE OFFICES.
LORD COL

THE SUN INSURANCE OFFICE, LOWGATE, HULL. B. S. JACOBS, F.R.I.B.A., ARCHITECT.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

given by the authors of the designs, which attempted to comply with the regulations, was no less than £32,000, the highest being £45,000 and the lowest about £13,000. It was sufficient to say that in the latter the estimated cost given was most unreliable. Several of the designs sent in were of the highest merit, but in most cases due regard to the question of cost had not been observed, with the result that many otherwise good designs had to be set aside as extravagant in plan and detail. He trusted the Council would accept his decision as final, as he was convinced that course would be not only in the interests of the Council, but more satisfactory to competitors, and it would prevent any suspicion or discussion as to the fairness of the competition. To No 43 he awarded the first place, first on account of general completeness and convenience of the arrangements of the plan; secondly, the grouping of the several departments on distinct floors and in blocks; thirdly, the arrangement of the Council Chamber and surrounding committee and other rooms used by the Council; and fourthly, the complete and self-contained arrangement of the caretakers' rooms. The estimate given by the author of the design might be considered approximately correct. No. 2 was awarded second place, and No. 38 was placed third.

Mr. Buller Howell moved, on behalf of the Offices Committee, that the report of the assessor be adopted, and that if the Council saw fit the present committee be continued in office to carry on the work. The envelopes containing the names of the successful competitors would be opened in the Council meeting.

Mr. Wakefield: May we have the estimated cost?

Mr. Coon thought it was preposterous to ask the Council to sanction any scheme without letting them know what the cost was likely to be.

Mr. Fellowes Prynne stated that the estimate of the first design was £19,861 with the Council Chamber or £16,261 without the Council Chamber; the estimate of the second design, £24,345; and of the third, £23,854. The cost of the lowest estimate of £13,000, when it came to be cubed up, had to be raised to something like £20,000. The prices were merely for the building, and did not include the boundary walls and the architect's commission.

Mr. Coon: The least expenditure capable of providing buildings is £19,191 then.

The Chairman: I think of all the plans, this one, if it is selected, is the cheapest.

Mr. Hosken: Are we committed to the policy of spending £20,000 for the erection of county offices? I have no recollection of anything of the kind coming before the Council, but before we launch on a scheme of that kind the vote of the Council should be taken.

Mr. Buller Howell said the Council committed themselves to getting a piece of land near the railway station—which they got—and to asking for competitive plans to see what the cost would be if the Council chose to build for the accommodation required. He did not think that beyond that the Council committed themselves.

Mr. Fellowes Prynne said the plans put before them were made in accordance with the conditions issued by the committee, specifying certain rooms of certain areas to be occupied, various apartments to be arranged. The one chosen was really the best arranged of any; it complied in every respect with the conditions, and certainly was by far the cheapest of those which complied with the conditions. As far as the conditions went, he did not really believe it would be possible to make a plan more economical. As a matter of economy in planning there was absolutely no waste in corridors and things of that kind.

Mr. Tyacke: What is the present cost of offices in the county?—A voice, £150.

Mr. Buller Howell said additional accommodation was almost necessary at once, and the lease of the present offices in Truro would run out at Christmas next year.

Mr. Tyacke: It means that the new offices will cost £1,500 a year.

Mr. Buller Howell: We calculate £1,200—a farthing rate.

Mr. Coon: The new offices will mean an annual charge ten times greater than we are paying at the present time.

Mr. Carkeek said it was not in keeping with the county that they should be beholden to the Corporation of Truro for rooms to hold their meetings. The least that could be done was to house those who were willing to sacrifice their time and ability to the interests of the county.

Mr. J. C. Williams: Is the Council finally committed to having new offices?

Mr. Buller Howell said there was no obligation on the Council to accept the plans of the successful architect, but if no action was taken on the plans in twelve months a further £50 would be due to the architect who was placed first.

On the motion of Sir Francis Layland-Barratt, the Council accepted the report of the assessor so far as it affected the award of the premiums to the successful competitors.

THE TOWN HALL, HARRISMITH, NATAL.

The buildings, comprising Town Hall, municipal and departmental offices, Public Library and Market Hall, were built at the cost of over £26,000. The architects were Messrs. Price and Agutter, of Maritzburg.

The new Town Hall is treated in the Renaissance style of architecture, being built of red brick with facings of local stone. The frontage of the Town Hall is 112ft., and the buildings extend back a depth of 194ft., the Town Hall block being alone 130ft. in depth. The height of the parapet of the main building is 36ft. above the ground floor, and the pediment surmounting the portico—which is a feature of the facade—reaches to the height of 44ft. and is surmounted by a flagstaff.

The vestibule is paved with marble, and the four columns, with their frieze and cornice over, will form an important feature here. Glazed teak swing doors admit to the lobby leading to main crush hall, which is paved throughout with marble tiles, and ornamented by twelve pilasters, the shafts of which are in selected Cippolino marble.

On the left or Southey Street side of the buildings on the ground floor are placed two retiring rooms, in connection with the large hall, and the Public Library, with its lending department and public reading and reference rooms.

The large public hall, the dimensions of which are 72ft. by 51ft., provides ample public accommodation for dances, concerts and theatrical performances in the town. The floor is in maple and the walls and plaster enrichments throughout are finished in Umzimkulu lime plaster, with main frieze in Cordilova, and gallery fronts in same material painted suitable tints. The hall is lit by clerestory windows in wrought-iron, with leaded lights, and the main barrel ceiling over the hall is carried out in Umzimkulu lime plaster. The seating accommodation, including that of the galleries, is for 850 people.

On the first floor, Bester Street side, is the Council Chamber and reception or banqueting rooms, divided by a large folding mahogany partition 16ft. wide by 12ft. 6ins. high, which, when opened, will convert the whole into one large apartment 62ft. by 19ft. 6ins. on the occasion of important functions or ceremonies such as receptions, banquets, etc., a service room being provided in connection therewith, having direct communication with the kitchen by means of lifts and a suitable storeroom with necessary cupboards. On the main front of this floor, on the right, is the Mayor's parlour, communicating with the Council Chamber, and on the left a large committee room.

The rooms on the Southey Street side are a museum and picture gallery 39ft. long by 19ft. 6ins. wide, and four rooms accommodating the Town Engineer's department.

The Central Market Hall is 66ft. long by 48ft. 9ins. wide, and is entered on three sides from the verandahs through sliding doors. Accommodation is provided in addition for five separate lock up stalls, averaging 12ft. by 11ft. each. The openings to these stalls are provided with steel roller shutters. In addition, a separate office is provided for the Market-master, with a fireproof safe and iron door. Under a portion of the market is storage cellar 60ft. by 23ft., with an iron staircase leading from the yard and a lift communicating with the market floor.

The erection was carried out under the supervision of Mr. E. A. Agutter, A.R.I.B.A. Messrs. Kelly, Anderson and Co., of Johannesburg, were the contractors, Mr J. Kelly being their representative. The clerk of works was Mr. B. Benson.

PLANNING OF SCHOOLS.*

By H. T. Buckland.

Peculiarity of English Schools.

In the daily time-table of both the elementary and the secondary school there is an assembly each morning before dismissal to class-work; this gives rise to one of the important differences between the plans of schools in this country and those of America and the Continent, viz.:—the relation of the assembly hall to the rest of the building. In the majority of our schools this occupies an important position, due mainly to its frequent use; in America and on the Continent it is usually placed on an upper floor and comparatively out of the way, owing to the fact that a daily assembly is not the rule, as the children enter the school and go straight to their class-rooms. For this reason we find many of these schools planned with a cloak-room in connection with each class-room.

Board of Education Rules.

The rules of the Board of Education to be observed in the planning and fitting up public, elementary, and secondary schools of necessity influence all planning so considerably that it is not possible to proceed very far without a reference to them, as they are the guide to which all authorities (upon whom the burden of providing school accommodation rests) are compelled to defer when arranging for the erection of a new building; rather, however, than discuss them *seriatim* I should prefer to consider their practical application. Let me assume for a moment that an Education Authority in a large town has to erect a new school, and is about to instruct an architect to prepare plans. What are the points upon which the latter will need to be informed?

1. The number of children to be accommodated. 2. In what number of departments the school is to be planned. 3. Is the building to be planned on one or more floors. 4. What numbers are to be accommodated in each of the class-rooms.

Site and Aspect.

I have assumed a site has already been chosen, as in large towns sites have frequently to be purchased long before a school is required, so that in many cases the architect who is eventually employed to erect the schools cannot be consulted. Where, however, this is possible, it should certainly be done, as the question of aspect is an extremely important one. We have, many of us, I dare say, been faced with the problem of planning a school to go on a long narrow site, with its short axis north and south, and an absolute instruction to get the majority of the class-rooms on the south side; no easy matter if the school is to have central halls, and the length of the site is comparatively limited. It is true in a large town that one is not able always to choose a site with the *best* aspect, for the simple reason that there is not one to be had; in that case obviously any instructions with regard to the aspect of class-rooms should be very general in character.

---

*Extracts from a paper read by Mr. Herbert T. Buckland before the Architectural Association on February 5th.

Preliminary Points.

I will now return to the points upon which I suggested an architect would need to be informed before commencing to plan a school, and consider them in the light of the Board of Education's requirements. Dealing first with elementary schools, my first two points together. Number to be accommodated, and in what number of departments. What does our guide say? "No school should ordinarily be built to accommodate more than 1,000 to 1,200 children in three departments. No single department should accommodate more than 400 children. A large school in three departments might conveniently be divided in the following proportions:—Boys, 360; girls, 360; infants, 380." It goes on to say: "In departments of this size, the most suitable plan is that of a central hall, with the class-rooms grouped round it." Now, it is obvious from this instruction that a school with three departments if planned as suggested must have three central halls, unless advantage is taken of a further instruction, which says: "A single central hall may be provided for the joint use at separate times of two departments, provided that it is so placed as to be readily accessible from the class-rooms of each department." There may be many examples of scholars where this condition has been taken advantage of. The only one I am personally acquainted with is at Darlaston. In this school, one hall is used for three departments. Now, although a three-department school may be the most efficient, it is also the most expensive both to build and to maintain, as a head master and two head mistresses have to be employed. Either this fact, or a preference for a mixed school, has led to the building of schools in two departments instead of three, viz.:—an infants' and a mixed department, whether with a view to economy or the preference already suggested, I am unable to say. If the latter, the plea is certainly justified by the Continental and the American practice, as mixed departments are the almost invariable rule both in America and on the Continent. And in Great Britain it may be said that as we go further north the mixed school gets more common, and in Scotland is almost universal.

Number of Floors.

The next question upon which we have to seek enlightenment is whether the building is to be planned upon one or more floors. Upon this point our guide says: "Where the site is sufficiently large, open and fairly level, the most economical plan is that of a school on a single floor. Such an arrangement is also preferable on educational grounds. In any case it is desirable that a school building should not be on more than two floors. A building on three floors is open to many objections, and should only be proposed in special circumstances or on very costly sites. This recommendation has, I think, been very widely adopted throughout the country; and in Birmingham no elementary school has for many years been erected with more than one floor.

Then as to the numbers to be accommodated in each of the class-rooms, after suggesting the sizes of the departments—boys, 360; girls, 360; infants, 380—the rules go on to say: "As a rule, such a department would probably require seven class-rooms." This would give us six for fifty each, and one for sixty, in each of the upper departments; and four for fifty, and three for sixty, in the infants' department.

Size of Class-rooms.

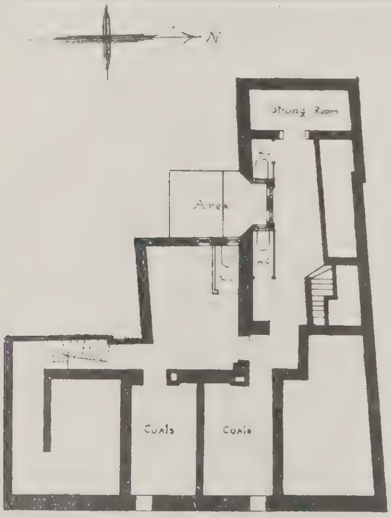
Education authorities and head teachers in elementary schools are, I believe, fairly generally agreed that a class of fifty children is all a teacher can efficiently teach. The need for class-rooms accommodating sixty is chiefly to provide for the classes at the beginning of the educational year, as they are always larger then than at any other time, and only gradually drop to the average.

These, then, are the main points to which consideration must first be given in the planning of all elementary school buildings; I will now show one or two examples illustrating various methods of dealing with them. I think there can be no question that a central hall is undoubtedly the best for an elementary school, as it affords excellent means of supervision and convenient access to class-rooms, and although schools have been recently built with an enlarged corridor which might almost be called a central hall, the examples I propose to show all have the marked characteristics of a genuine hall.

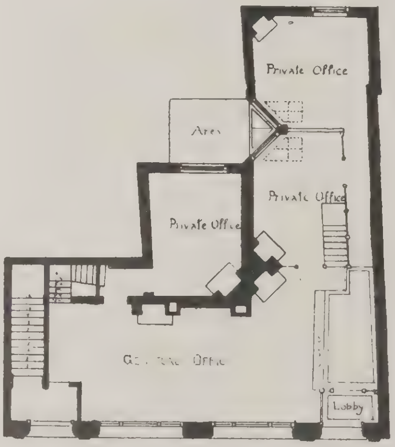
Different education authorities have different views with regard to the erection of a three-department school one one floor. We shall find some prefer all the departments in *one* block, others in *two* blocks (the infants' department being the one usually kept separate), and in some cases a preference appears to exist for each department in a separate block.

The *pros and cons* may be briefly summed up as follow:—A building in one block is more economical to erect; can be heated from one centre, and is consequently cheaper to maintain.

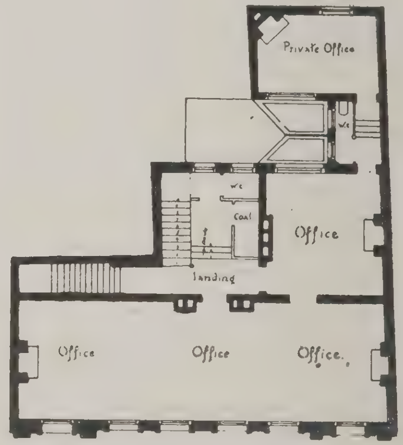
(To be concluded.)



Basement Plan

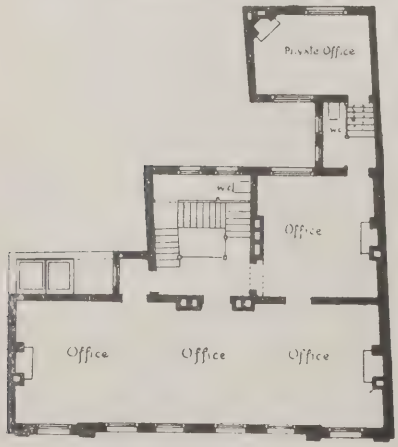


Ground Floor Plan.

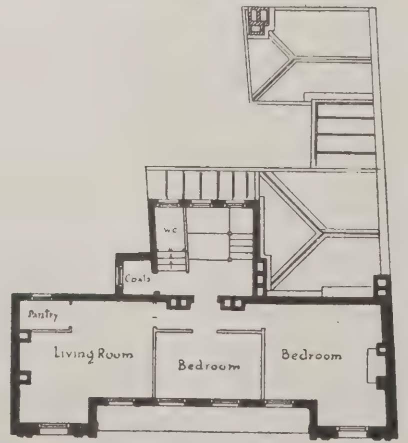


First Floor Plan.

Sun Fire Office Lowgate Hull
Scale 8 Feet to 1 Inch.



Second Floor Plan



Third Floor Plan.

B. S. JACOBS, F.R.I.B.A., ARCHITECT.

CONTRACTORS' SECTION.

THE DECAY OF APPRENTICESHIP.

In our issue of January 13th, we touched on the causes which have brought about the decay of apprenticeship, and suggested that, the question being one of national importance, ought to be dealt with on a wider basis than has hitherto been attempted.

We propose now to examine the question further, to see whether any broad lines of treatment can be suggested.

Hitherto the replenishing of the gaps which naturally occur in the rank and file of those engaged in trade and commerce has been left to the private initiative of those seeking a career and of those requiring workers.

The modern methods of production have admittedly acted adversely on the method of training the new industrial recruits by apprenticeship, both in this country and elsewhere. The question is: How shall industrial training be given under the new conditions? The matter needs considering from several aspects.

The General Point of View.

There is the general point of view, that it is essential to the continuance of our national welfare that every young person in Great Britain, broadly speaking, should be given a training which will enable him or her to earn a livelihood in some branch of industry or commerce, or in some profession, and that the efficiency of such training is equally a matter of national concern.

At one time, primary education was regarded as purely a matter for private initiative also, but now is rightly considered a matter of national concern. Secondary education is travelling rapidly in the same direction, and these two provide for the training of the young up to a certain point.

In view of the need there is for maintaining our national productivity at the highest level of efficiency; in view of the way the unemployed problem grows in magnitude through the growing excess of unskilled workers; and in view of the admitted defects in present methods of apprenticeship, it does seem that the next step should be the adoption by the State of the broad principle that the education of the children of the nation must be considered a matter for State supervision from the time they enter the primary school until they emerge from an apprenticeship able to earn their own livelihood.

Then there is

The Point of View of the Employer.

To the employer, the worker is in a certain sense a human productive machine, differing in kind, but hardly in principle, from the machinery which now plays so important a part in production. The employer wants the most efficient workers possible of their respective kinds, and he can hardly fail to recognise that it is as much his business to provide himself with efficient workmen as it is to have efficient machinery. Efficient workmen do not grow, however, they have to be made, and therefore it is the employer's duty to make them through apprenticeship, or some substitute for it. Employers probably recognise these facts in a general way, and many of them take some trouble to make apprentices, but the system of "laissez faire" which prevails in regard to making, training, and controlling apprentices, causes employers to avoid the responsibility, unless there is something clearly to be gained by employing the cheap labour of apprentices. This last motive is not a healthy one for the system, however; the whole legal theory underlying apprenticeship indentures is opposed to the exploitation of apprentices in that way.

Moreover, it antagonises the adult workers, which is detrimental to progress on the part of the apprentice. Employers' associations fully recognise the importance of this matter, but can do little beyond calling attention to it as things at present stand.

If, however, it became the duty of every employer to contribute to a national apprenticeship training fund, such fund to be assisted by Government grants; and if, although no employer was compelled to take apprentices, yet, those who did so experienced a relief in the amount of their contribution, a very different state of things would quickly come about.

If the administration of such a national fund was in the hands of representative committees elected from employers, workmen, and Government nominees, an economical organisation for the training and supervision of apprentices could be created.

The system of Government grants enables a proper control and direction to be given to the system.

It is not suggested that such a scheme should interfere with existing trade schools, technical schools, and the like; the suggestion is aimed entirely at providing apprenticeship training in the shop, works, office, etc. There ought not to be any serious difficulty about tuition if the services of the older workmen were utilised to act as teachers in the respective shops; a moderate remuneration would enable this to be done, and a further period of usefulness to open to men who are past their prime or have sustained accidents, while the valuable experience of the elder men would be imparted to the rising generation instead of being largely lost as it is under the existing lack of system.

There also is

The Point of View of the Young

and of their parents. In regard to the children, their welfare would be greatly promoted by the age at which they are permitted to leave school being raised from 14 years to 16 years of age. The latter age is quite young enough for entry into business life, and we believe employers generally prefer not to take apprentices until they are 16 unless they are exceptionally well developed.

There results a lost period between 14 and 16 which is often filled by youths acting as errand boys and the like, and seems largely a wasted time.

Again, there is no commoner experience than this, that a man finds when he reaches full age that he has chosen the wrong occupation and wasted his time in trying to learn a trade for which he was not fitted by natural capacity.

This waste of time and energy might be mitigated if the young people in the last two years of school life were given opportunities of seeing something of the kind of work they contemplated becoming apprenticed to. It is related of the celebrated Dr. Franklin that when he had finished school his father took the boy on a round of visits to the various workshops in Philadelphia and allowed him to see and say which he would prefer, and that as a result, printing was chosen, with every satisfaction in the outcome.

In regard to the parents, the principal difficulty is a financial one; they would like their children to stay longer at school and to learn a trade, etc., properly, but do not see their way to afford it; also, the wages earned in the earlier years by apprentices compare unfavourably with those of office and shop boys and the like.

The smaller earnings of junior apprentices is partly due to their starting at 14 instead of 16 years of age; the employer considers them not worth much for the first two years. This would cure itself to a great extent if the children remained at school until 16; they would be better developed both in mind and body, and if placed at once under the better tuition suggested, would quickly be worth a good deal more than they are under present circumstances, and more than could be earned by errand running and the like. There remains therefore only the question of the two years longer at school.

It is clear that the time is coming when children whose parents are unable to feed and clothe them enough to enable them to receive primary education will have to be assisted in these respects for humane reasons, and because it is in the National interest that this should be done, and the same argument would extend the assistance a little longer without much difficulty. It is probable that the amount of assistance required would tend to diminish after a couple of generations, because it is reasonable to expect that with better education and proper industrial training the causes which now make assistance necessary would largely disappear. From

The Workman's Point of View

the suggestions herein made could hardly fail to be beneficial; workmen's organisations have to provide funds for much unemployment, due to lack of early training or to premature superannuation on the part of their members; the better educated, the better trained the workers are the more intelligently will they be able to use their organisations to improve their lot, and the more intelligently the workman's organisations act the less hurtful are they to either employers or the community.

The opportunities, under such a scheme as is here suggested, for employment as practical teachers in the workshop, ought to prove very acceptable and help to solve a very knotty problem which is at present exercising the workmen's unions.

It would appear therefore, that, looked at from the standpoint of each of the parties concerned, the suggestions we have put forward would confer substantial advantages and solve satisfactorily the question of apprenticeship.

What is the Alternative;

for we take it the present methods must ere long give place to some better way.

The alternative is a large development of technical schools of various kinds, with consequent increase in the time youths will have to spend in learning their trades without being able to earn money meanwhile; this means a great increase in cost on account of the expensive buildings and teaching staff required; and the result cannot be so satisfactory, for all who have practical knowledge of this question will admit that the technical school training is no adequate substitute for the training of the workshop and the office.

Conclusion.

Whether, therefore, we look at this question from the side of efficiency or from the side of cost, a scheme on the lines we have indicated, where the control of the instruction to be given is kept in the hands of those who best know what is wanted, and who are most interested to see that the right kind of instruction is given and most concerned to see that no undue expense is incurred, must prove the most satsfactory and successful in every way.

Mr. Thomas Brock, R.A., has now practically finished the plaster model for the statue of Sir Henry Irving, and all that now remains, therefore, is the casting of the figure in bronze, which is, of necessity, a matter of time. It is hoped that the statue will be erected on the site arranged for it at the back of the National Portrait Gallery in Charing Cross Road, during the autumn of the present year.

NOTES ON PAINTING AND DECORATING.

Wall Paper.

The best sample books of the wall-paper manufacturers' new patterns just issued are rather interesting this year, as indicating the popular taste in mural decoration. Happily there is a considerable increase in the number of what one may term "adaptable" designs—that is, wall-papers which are produced in such a way that they may be used in different ways according to the size of a room. This is effected by supplying various borders, bands, etc., which are used for panelling, and by carrying the same system further in the frieze by providing the principal object of ornamentation with "extension pieces," which may be cut down according to requirements. By these means the objectionable feature in wall-paper decorations so frequently met is done away with, and this objection is that in many cases it is almost impossible to avoid prominent pieces of ornamentation, which "go round a corner," thus utterly destroying its ornamental character. With this new system it is easy for an ingenious decorator to place say, five of the principal centres of ornament of the frieze along the wall, and four on the wall at right angles, these being slightly further apart. Another feature noticeable in the new patterns is the many "cut out" designs. Instead of adhering strictly to horizontal lines, top and bottom in the frieze, there are many patterns now to be had which are expressly made to be cut or scolloped out, and this gives a much better effect. But after all there is nothing new about this system, except that it is once more brought to the front.

There is an increased number of Early Victorian papers, and a marked falling off in ingrains, doubtless due to the fact that this class of paper, although it gives an excellent background for pictures, and from a decorative point of view is in many ways satisfactory, yet is not always entirely beyond suspicion with regard to the quality of permanency.

It is interesting to observe also the change in colour in many of the patterns from year to year, and equally interesting to observe how the taste in decoration seems to run in cycles, hence the present demand for Victorian patterns.

It is not so many years ago since strong colours were mostly in demand, with ornamentation either of a strictly conventional and frequently rigid and ugly style, or of a pronounced effect which was equally objectionable. Then we came to find the prevailing colour a muddy class. Now we have arrived at something much better—that is to say, really delicate colours, suitable for drawing-rooms furnished appropriately, rich colourings in bright designs for large halls and places of public resort, which are bold enough to bear them. We have also a number of actual or realistic effects, many of a very beautiful character in the shape of roses, sometimes arranged to climb over lattice ladders, so to speak, with large intervals of white between.

On the whole, it must be acknowledged that wall-paper designs taken in the aggregate are at present as far advanced as they have ever been, when the price (which must regulate such matters to a great extent commercially) is taken into consideration. Last year there was a great number of heliotrope and violet designs, but this year there are by no means so many. Probably this is due to the fact that such colours do not show up well by artificial light.

There is, however, an increased number of browns, ranging from rich chestnut to biscuit colours, and those in plain papers with appropriate hand stencilled friezes applied on the extension principle already referred to, permit of very charming decorations at a moderate cost.

Paints.

There is unquestionably an awakened interest among architects and builders as to the merits of zinc oxide and pigments other than white lead. Time was when the building trade from the highest to the lowest considered that the best paint was one necessarily made from pure white lead, pure linseed oil, and pure turpentine; indeed, this opinion prevails very largely to-day. Those, however, who have closely studied the subject of paints and painting, are aware that it has been fully demonstrated that while the paint named is an excellent one, which may be taken as the standard for work of a uniform character, yet it is by no means the "be all and end all" of paints. On the contrary, a paint properly made is one which is exactly suitable for meeting the conditions of surface to which it is to be applied, and the atmospheric or other changes which tend to cause its destruction. Thus it will be found that if we start on the white lead base we usually add other pigments to counteract the weaknesses of that lead, and it is here that zinc oxide is so valuable, because it is unaffected by sulphurous fumes, which, as is well known, turn lead black. Zinc is said to be brittle, white lead, on the contrary, has a tendency to "chalk"—that is, in time to get into a condition where it can be rubbed off with the hand. A mixture of the two, however, will cause one to strengthen the other, and it is here that the ready-mixed paint manufacturers score. They, knowing this fact, are aware that when the two pigments are very finely ground together with pure linseed oil an almost ideal paint is made for many purposes. This, of course, is a simple illustration of what is old truth, and the practical paint man knows that it is impossible to turn out a paint suitable for any or all purposes—as impossible as it would be for a doctor to prescribe medicine which would effect a cure for all human ailments.

Some of the best special brands of paints are good and durable, because the point mentioned has been carefully studied, but also because the manufacturers have recognised that it is not only to the pigments they must look, but to the binding liquids or materials—one must be varied according to the nature of the other.

It will probably surprise many readers when I say it is my opinion that one of the most durable and cheap paints—as far as durability is concerned—can be made by grinding together in an appropriate vehicle equal parts of best white lead, zinc oxide, and pure barytes. The last-named mineral is, of course, the well known adulterant of white lead, which is looked upon as generally having a terribly deleterious effect upon paint, but which is, as a matter of fact, absolutely inert, and therefore durable, but possesses the disadvantage of having little or no "body." This means that a paint made of the materials named might render it necessary to apply four coats instead of three, but if the cost of labour or length of time were taken into consideration, I believe it would be far cheaper in the end to give four coats instead of three of ordinary white lead.

Washable Water Paints.

It is only during the last twenty years or so that washable water paints have been known. Their advantages are so remarkable, and their use has increased to so great an extent that there is now hardly a prominent manufacturer of painters' materials who does not make also his particular variety.

The most convenient way to describe this class of material is to say that it is a half-way-house between ordinary distemper and oil paint. When two coats are applied—and it is rarely necessary to give more—a complete covering is given to a wall surface, and if the work is done by expert hands, there is absolute uniformity without the suspicion of a break or line between the various coats. There is no limit practically to the colours. Beautiful greens, blues, browns, and yellows, say, to the extent of a hundred or more different shades, hues, and tints, are stocked by all the principal manufacturers, and they are, as a rule, quite permanent, even when put upon new plaster, or, at least, such colours which are not fast under such circumstances are clearly differentiated from those which are considered lasting under such conditions. The price of a washable distemper may be taken at about one-half to two-thirds that of oil paint.

But it is not only in connection with the prime cost that there is an advantage in the use of washable distempers. In an ordinary room, say, for example, one which is used for public gatherings, a concert room, or a meeting place where ordinary wall paper would hardly be considered appropriate, the choice comes between oil paint, distemper, or a washable water paint. If oil paint is used, the trouble that is likely to ensue is that when the air becomes charged with moisture, as it is certain to do when meetings are held in the evening, there will be a condensation of moisture upon the walls, particularly at the top. The oil paint being non-absorbent, will cause this condensation to descend, carrying with it any dirt which may be in the atmosphere, and usually leaving nasty marks and streaks upon the walls.

When distemper is used exactly the same thing occurs, but with this difference, that the dirty and irregular mark becomes fixed upon the surface of the wall and cannot be removed, excepting by redistempering the whole surface.

In the case of washable distemper, the surface presented is, to a considerable extent, absorbent, yet not so much so as to prevent the surface being washed down and the effects of the condensation referred to being removed. From what has been said, it will be readily conceded that washable water paints are in many respects most suitable for the walls of public institutions, hospitals, workhouses, etc., and the beauty and refinement of the material cannot be too highly spoken of. It is not so long back since it was thought necessary, in order to properly decorate a place of resort to cover the surface of the wall with ornament, but happily this idea has to a very large extent been removed and most people understand now that the requirements of decoration insist upon a restraint in the use of ornament and particularly in the production of a restful and quiet effect. Even with these objects in view, it must be acknowledged that washable water paints have much in their favour. By their use one is enabled to obtain an absolutely flat surface, free from gloss, which is most valuable under certain circumstances, and particularly when irregularities in the surface of the wall would render the use of a varnished or glossy surface objectionable; and, of course, there is practically no limit to the ornament which may be introduced when washable water paints or distempers are employed, because the frieze, and, if thought desirable, the whole surface, can be stencilled with ornaments in appropriate colours. It should be mentioned here—and the facts cannot be too widely known—that a coat of a really good water paint under ordinary oil paint is an almost certain cure for blistering. I have known many cases of work specially exposed which have resisted all efforts at a cure, but which have never blistered again when the undercoat of washable water paint was applied.

An interesting triptych by Hans Memling (1425-1495), which was painted at Bruges about 1467 for Sir John Donne, of Kidwelly, Carmarthen, has been lent by the Duke of Devonshire to the Fitzwilliam Museum, Cambridge. There are, it is stated, only five other examples of Memling's art in England, two of which are in the National Gallery.

* * *

Of the sum voted by the United States Congress for the relief of the sufferers from the Italian earthquake, half a million dollars will be applied to the purchase of building materials, and the construction of 3,000 frame houses, which will be transported from New York in six vessels, and accompanied by several carpenters.

Bird's-eye View of the Residence and Experimental Ground, including the Museum and Workshops.

TRAINING SCHOOL AT ARCUEIL-CACHAN.

TRAINING SCHOOL FOR CONSTRUCTIONAL INDUSTRIES & PROFESSIONS AT ARCUEIL-CACHAN, NEAR PARIS.

In connection with the recent International Congress of Builders at Paris, mention has been made of a visit to an interesting school, which specialises in training for the building and other constructional trades. As it is claimed that this school is unique of its kind, it may be of interest to briefly describe its organisation, aims, and methods. The school is in two parts, consisting first of headquarters in Paris, where lecture courses are given by professors who are specialists. A list of 101 such professors is given. The second part consists of an institution situated about half an hours' journey from Paris, at the suburb of Arcueil-Cachan and standing upon a plot of about eight acres. Here are the director's residence, a large building used for the boarders, and a number of workshops and class-rooms of one storey, very cheaply, but suitably constructed, mostly by the pupils: a large portion of the land is left unbuilt upon to serve as a demonstration ground. For the morning courses, the students attend the lectures in Paris; for the afternoon, they attend the practical courses and do demonstration work at Arcueil.

The school consists of sections:—One, in connection with public works; a second in connection with building; a third deals with the applications of electricity; and a fourth with geometry and topography, as required in connection with the other branches. The teaching is divided into preparatory course (of 1, 2, or 3 years), and special courses. The special courses extend to two or three years, according to whether the student takes the full scheme of tuition or a modified scheme suitable for foremen, architects' and engineers' assistants, and the like. Diplomas are given to those who have attained a certain standard of efficiency.

The practical courses consist of designing, topographical work, testing and laboratory work; and practical work of all kinds such as excavation, masonry, brickwork, joinery, ironwork, and the uses of modern machines and methods connected with the industries under consideration. The preparatory course may be omitted if pupils have already acquired a sufficient knowledge of elementary science and mathematics to enable them to follow the special courses. In the latter the idea is to give a theoretical and practical training which will fit students to fulfil positions such as managers and engineers of works, contractors, managers of railway companies, electrical and architectural engineers, foremen, clerks of works, etc.

Three methods of teaching are pursued to suit day students, evening students, and corresponding students.

The school is a private venture, has no State or other assistance, and has been in successful operation for sixteen years, during which the number of pupils has steadily increased from 15 in 1892 to 5,994 in 1907. During the long vacation students are afforded opportunities for spending as much time as possible in industrial concerns, where they make themselves useful and see in practical work the application of the theory they have studied at the school. It is evident, therefore that the school meets a real want, and, indeed, it is claimed that the employment for finished students from this school exceeds the supply.

Interior of the designing room.

The main features which seem to make for its success are:—First, the combination in one school of the four related sections referred to, which enables a definite programme of practical work to be laid out for each year, as, for example, in 1906 and 1907, when the installation of a small railroad was undertaken, involving every kind of operation necessary to a complete installation. This was first studied and designed and then executed on the experimental ground by the pupils. Each section had its share in the completed work. This method is superior to that which attempts to deal exclusively with one trade or handicraft, as brickwork, joinery, and the like, and must be much more interesting to the students.

Second, the combination of theory with practical applications, which pervades the whole scheme, and the opportunities afforded to visit works in progress.

Third, the methods of teaching, by correspondence, evening classes and day classes, which enable students at a distance to go to Paris to enjoy the advantages of a full course: thus the whole of France becomes a recruiting ground for the school, and accounts for its large number of students.

There would appear to be an opening for a college on similar lines in this country, combining the sections of architecture, building, civil engineering, and electrical engineering, working in sympathy with existing agencies for training in these professions.

Mr. W. Kaye-Parry, M.A., Dublin University, M.Inst.C.E., F.R.S.I., has been appointed External Examiner in Sanitary Engineering in the Faculty of Technology in the Victoria University of Manchester.

* * *

We have received a copy of a pamphlet in which the plans and sections of the A.A.A.C., or Architectural Association Athletic Club, are set forth. Messrs. J. H. Squire, L. M. Gotch, F. A. Silk, and A. L. N. Russell, are the editors, and we judge from the particulars given that the A.A.A.C. is flourishing as the green bay tree.

* * *

Wills.—Mr. Edward Augustus Gruning, F.R.I.B.A., who died in December last, left estate of the gross value of £188,377. Mr. A. C. W. Hobman, Cliftonville Works, South Bedmondsey, of the well-known firm of tar-paving contractors, who died on October 8th last, has left estate of the gross value of £28,022 17s 8d.

The experimental ground, with the workshops, laboratories, etc.
TRAINING SCHOOL AT ARCUEIL-CACHAN.

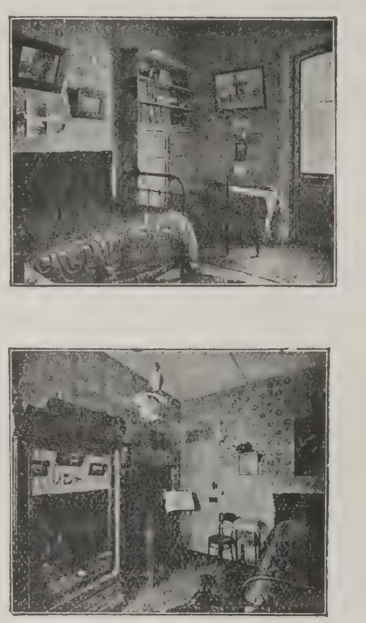
SOME RECENT COMPENSATION DECISIONS.

The Workmen's Compensation Act of 1906 continues to provide a most luxuriant harvest to the legal profession. The extreme vagueness of this piece of legislative venture, and the remarkable elasticity of which its provisions are capable, have been the subject of a good deal of criticism; and these shortcomings are exemplified in a batch of very interesting cases which have engaged the attention of the Courts during the last month or so. Generally the decisions that have been registered in these cases show all too clearly how judiciously has the net been spread to ensure the liability of the employer. But they do, thank goodness, in one or two instances establish the feasibility of a workman meeting with some sort of mishap in some circumstances, and yet cutting himself off from the support of his employer.

A case in this category is that of Warncker v. R. Moreland and Son, Ltd., in which the Court of Appeal has decided that the refusal of a workman to submit to a simple surgical operation disentitled him from compensation in respect of an accident for which the employers had already been held liable. The risk involved in the operation was hardly appreciable; but the County Court judge had held himself bound by an earlier decision of the Court of Appeal (in Rothwell v. Davies), and had reluctantly found in favour of the man. Their Lordships of Appeal, however, have reversed the finding of the lower court, on the ground that in the earlier case it was proved that the operation was fraught with considerable danger, whereas in the present case there was practically no danger attached to the operation. The reasonableness or unreasonableness of the refusal must be the deciding factor in such cases; and the workman's justification for declining to submit to surgical treatment depends upon the nature of that treatment and the man's physical condition.

Of direct importance to the building trade is an interesting decision that has been given by his Honour Judge Hans Hamilton in the Kirkham County Court. A bricklayer had met with an accident in the course of his employment, in respect of which he received compensation from his employer. Subsequently the employer executed a deed of assignment, and further payments were received from the Federated Employers' Insurance Association, Ltd. The payments, however, eventually ceased altogether, the insurance company denying further liability under a clause in the policy determining their liability in the event of the employer becoming bankrupt. The man asked for an order against the insurers for the continuance of the payments, and his Honour granted the application.

Another remarkable decision given by the Court of Appeal is that delivered in Colclough v. the Orrell Colliery Co., establishing the dictum that a posthumous illegitimate child is a "dependent" within the meaning of the Act. A young collier was engaged to be married. The banns were published, but two days before the date fixed for the marriage the man was accidentally killed at his work. A child was born to his intended wife three months after the man's death, and the County Court judge, holding that it was a dependent upon the earnings of the deceased, awarded it £155. The employers appealed, but their appeal has been dismissed. The Compensation Act has a peculiarity not possessed by any other Act of Parliament, in that for many purposes it puts an illegitimate child in the same position as a child born in wedlock. It has already been decided that a posthumous legitimate child is a "dependent," and the Master of the Rolls based his interpretation of the Act in this case upon that decision. It is important, however, to note that in this case the deceased had fully admitted the paternity of the child. In other circumstances it would be very difficult to bring it within the scope of the Act.



A Pupil's bedroom.
TRAINING SCHOOL AT ARCUEIL-CACHAN.

A decision has been given by his Honour Judge Rentoul in the City of London Court, which, failing its modification by the Court of Appeal to which it is to be taken, must have a marked effect upon the practice of employers of assisting injured workmen pending legal proceedings. A labourer met with an accident, in respect of which his employers for six weeks paid him compensation at the rate of £1 a week. It was then discovered that the man's wages averaged only £1 11s. 2d. per week, and that he was therefore only entitled to compensation at the rate of 15s. 7d. The employers naturally enough declined to make any further payments until the overpaid balance had been worked off. The man took them to court, contending that they were estopped in law with regard to the overpaid monies. Judge Rentoul found in favour of the man, declaring that the overpaid amounts were really a present to the workman, and so need not be repaid. The employers gave notice of appeal; and, as their counsel pointed out, if employers are thus not to be allowed credit for their voluntary payments, they will be less inclined than at present to give any assistance at all until the workman has obtained a verdict against them.

The vexed question of the respective liability of principal and sub-contractor is the subject of another recent decision of the Court of Appeal. Wilson and Co., Ltd., a firm of colliery proprietors, contracted with a sea captain to take out two lighters to an oversea coaling station. The officer engaged and paid his own crew, and on the voyage one of these, the boatswain, was injured. He claimed compensation under the 1906 Act from Wilson and Co., and the County Court judge decided in his favour. Wilson and Co. appealed, but the superior court has upheld the judge's decision. The Master of the Rolls expressed the view that Section 4 of the Act is not limited to the case

Interior of the workshop.
TRAINING SCHOOL AT ARCUEIL-CACHAN.

A Corner of the Electric Laboratory.

TRAINING SCHOOL AT ARCUEIL-CACHAN.

of a sub-contract; and that a vessel may be "premises" within sub-section 4 of the same sections. His Lordship, however, refrained from expressing any opinion as to the effect of this very abstruse section where the facts may be different. Its interpretation must be according to the merits of the case; a useful instance of the wonderful ingenuity underlying the construction of this wonderful Act.

The power of the judge to reduce or suspend the weekly payments under an order under the Act, in the event of the plaintiff's imprisonment on indictment, has been asserted by Judge Sir Sherston Baker in the Lincoln County Court. An injured workman had obtained an order for 13s. a week compensation, and this his Honour has reduced by 1d. per week during the man's term of 9 months' imprisonment. There were four children dependent upon the "earnings" of the workman, and his Honour expressed the wish that the 12s. 11d. should be paid meanwhile to them, a suggestion which the applicants, Clayton and Shuttleworth, Ltd., said should have their attention.

We have outlined a few of the more striking of recent decisions under the Act. They serve to point the indeterminable scope which it gives in the workman's favour, and should impress the employer of labour with the extent of the liability to which it exposes him—liability, however, against which he can readily indemnify himself. We need hardly point out that with an Act at present so fruitful of indeterminate legal points, for a building trades employer to neglect to protect himself is to court disaster.

BIRMINGHAM CLERKS OF WORKS AND BUILDERS' FOREMEN'S ASSOCIATION

The last two monthly lectures delivered to the members of the above Association have been particularly interesting. In December Mr. W. H. Bidlake, M.A., gave an address on "Doorways," which he treated as the main features of every building, and traced their forms from the earliest times—when they consisted simply of two strong wood or stone uprights with a lintol over—through the Assyrian, Egyptian, Greek, and Roman periods, up to the Gothic and highly-decorated cathedral doorways of the Middle Ages.

The lecture, which was illustrated by lantern slides from photographs mostly taken by the lecturer, attracted a large audience, who accorded the lecturer at completion a very hearty vote of thanks.

In January, Mr. F. G. Whittall, the president of the Master Builders' Association, addressed the members, the subject of his lecture being "The Romance of a Building Stone." Mr. Whittall explained how the earth was at one time a molten mass surrounded by heavy clouds of steam, and how at that time the particular attraction of certain bodies for each other caused the formation of certain substances, as, for example, the combination of quartz, felspar, and mica, resulting in the formation of the granitic rocks; and how in later ages the sand resulting from the disintegration and crushing of the quartz, became compressed and hardened by the weight of superincumbent matter, through which water slowly percolated and became charged with lime and other cementatious substances, which were deposited among the grains of sand, thus forming our sandstone beds, whilst on the bed of the ocean limestones were being formed by the dead bodies of oolites, corals, and other marine organisms. These lime-

The Residence.

TRAINING SCHOOL AT ARCUEIL-CACHAN.

stone deposits were in later centuries upheaved by volcanic action, and through the depression of the ocean bed, and "the gathering together of the waters," they became land and the stone was ready for the use of man. The lecturer treated the difficult and vast subject of geology and the earth's formation and metamorphosis in a simple and interesting manner, which could be understood by everyone, especially as he produced samples of the various rocks when referring to their characteristics. The large audience followed his remarks with great attention, and at the conclusion many expressed their great delight and wonderment that their was so much to be learned about a simple stone. A hearty vote of thanks was given to the lecturer.

Proposed New Works.

ABERDEEN.—The Plans Committee of the Aberdeen Town Council have considered plans for the erection of one dwelling-house for two tenants, three dwelling-houses each for six tenants, and new aerated water factory in Seaforth Road for Messrs. Sang and Company. The Plans Committee have approved the plans of the following buildings:—Dwelling-house, on the west side of King Street (Woodside), for Mr. William Watt, carpenter; office and showroom on the west side of Holland Street, for Mr. William Masson, plasterer, per Mr. William Beattie, architect; two dwelling-houses on the south side of Willowbank Road, for Messrs. W. Henderson and Son, architects; hall, on the west side of Greyfriars Place, for the rector and vestry of St. Margaret's Church, per Mr. George G. Irvine, architect.

BAKEWELL.—The architects (Messrs. Bryden and Walton, of Buxton), have been instructed to proceed with the specifications and quantities for proposed new baths and pump-rooms, and application is being made to the Local Government Board for a loan of £3,500 for the work.

BLACKBURN.—The Town Council have approved of application being made to the Local Government Board to borrow £24,150 for the erection of a new higher elementary school, and £4,435 for the construction of a swimming bath in connection with the school. These buildings will be erected on a part of a site which cost the corporation more than £80,000.

CRUMPSALL.—The erection of a new library for the Crumpsall and Cheetham Hill district has been sanctioned by the Manchester City Council.

DUNFERMLINE.—At a Dean of Guild Court held at Dunfermline, Messrs. H. and J. Philip, joiners, Campbell Street, applied for and obtained warrant to erect a dwelling-house and stable at Castleblair Park; and Robert Macgregor, pasterer, Grantsbank Street, received permission to erect three tenement blocks of dwelling-houses at the corner of Victoria Terrace. It was stated that each block would contain six houses.

ECCLES.—The Town Council have agreed to borrow £2,739 to build twelve working-class dwellings in Corporation Road.

HALIFAX.—A scheme of church extension for the parish of St. Paul's Kingcross, is estimated to cost about £15,000, but the prospect of building is not immediate.

HOLBORN.—The Primitive Methodist Connexion, who have acquired Holborn Town Hall, expect to have to spend £10,000 on its conversion to suit their requirements.

INVERNESS.—The Town Council are considering the advisability of rebuilding the Burgh police buildings, at a cost of about £4,000, instead of altering the present buildings at a cost of £1,700.

LEWISHAM.—The following building and drainage applications have been approved by the Borough Council:—H. Brickell, Rojack Road, to build and drain an addition to No. 34, Stanstead Road; W. J. Scudamore and Sons, Manor Park, to build two houses on the north side, Nos. 97 and 99; B. Hosegood and Sons, Myrtle Grove, to build and drain two houses on the north side; W. Benton, Ewhurst Road and Crofton Park Road, to build and drain five houses and shops at the junction of Ewhurst and Crofton Park Roads; J. Watt, Eliot Hill, to build and drain six houses on south side (Nos. 7-12); J. Johnson, Brownhill Road, to build and drain two houses on the south side; J. W. Heath and Sons, Phœbeth Street, to build and drain seven houses on the west side (Nos. 22-32); James Watt, Eliot Park, to build and drain six houses on the north side; J. Laird, Farley Road, to build and drain two houses on the north-west side.

LLANDRINDOD WELLS.—The U.D.C. have resolved to apply to the Local Government Board for a loan of £10,000 for the erection of a pavilion in the recreation ground on the lines of plans submitted by Messrs. R. Wellings Thomas, F.R.I.B.A., and W. A. Millward. The original intention was to spend £6,000 on the proposed pavilion, but the Council are now satisfied that the needs of the place can only be met by a larger expenditure.

MATLOCK.—A Local Government Board inquiry has been held at Matlock Bath, dealing with the erection of a Kursaal and the conclusion of an improvement scheme which has been in hand for some years.—It was stated that under a special Act of Parliament the District Council was empowered to spend about £20,000 in promenades, pavilions, a pump room, etc., and in the acquisition of the property then standing on the sites. By private treaty and arbitration the Council has now acquired the most important sites in the town, and on the old Fishpond stables site is about to build a kursaal or pavilion, with a large ballroom, offices for the surveyor, town clerk, and the Council, and a pump room. The Council had left out of their Act, after buying the properties, about £3,000, and they now asked the Local Government Board to sanction the borrowing of a further £8,500 to complete the scheme. Mr. F. O. Stanford, A.M.I.C.E., was the inspector.

NEWBURGH.—The Town Council are applying for a grant of £5,000 from the Charles Anderson trust to provide a cottage hospital for the town and district.

PENDLEBURY.—The Swinton and Pendlebury Education Authority are about to erect a new public elementary school in Warwick Street, Cromwell Road, Pendlebury, and for this purpose have accepted the designs of Mr. T. J. Bushall, architect and surveyor, of John Dalton Street, Manchester. The new school, which is to be a single storey building will afford accommodation for 500 boys, 500 girls, and 250 infants, and the probable cost, based upon an allowance of £10 for each scholar, will be £12,500. The original intention of the Education Committee was to provide for only 1,000 children, but it was eventually decided to bring the number up to 1,250, and build a school which will in all probability meet the requirements of the immediate neighbourhood for the next 20 years.

WESTMINSTER.—An effort is to be made to complete a chapel to St. Joseph in Westminster Cathedral, at an approximate cost of £6,000. The altar and marble work alone are expected to cost £2,300.

BUILDING IN MOMBASA.

By A. G. H. Thatcher.

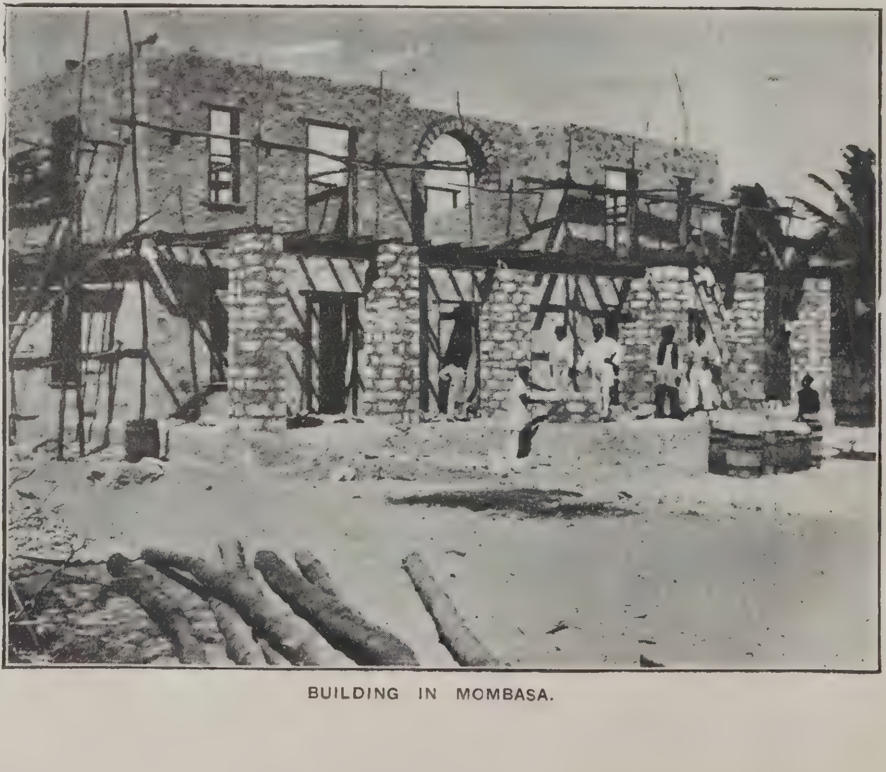
It cannot be expected that the means and methods of building on the East coast of Africa would be particularly up-to-date, and the photograph attached, which was recently taken in Mombasa, well illustrates that point of view. The building shown is to be a storehouse of two floors in height. The material for the walls is of a stone found locally and known as "coral." It is "cemented" together with a red earth, also found in the neighbourhood, but with better class work some lime is added to it.

The scaffolding employed is of the roughest quality, as will be seen from the print. The ladders are primitive, having an air of being "home made."

Brickmaking is quite a new industry in this part of the globe, at least on a systematic scale, but its recent commencement on a more extended basis probably points to a considerable increase in its use for buildings in the future.

This must not be taken to mean that there will be any opening for British labour in the connected trades. These are monopolised by the "fundi," or mechanics, who each work at their own trade. Hindoos and Swahili are chiefly employed, and their rate of pay—for the Hindoo an equivalent of about fifteen shillings per week, with no rations, and for the Swahili twelve shillings, with rations of rice—practically eliminates all possibilities of competition from white labour at present.

Europeans are not accustomed to live at the standard represented by the purchasing value of a few pence per day; and until such times arrive when European skill is required in the various operations necessary in this trade, the conditions are not likely to alter.



BUILDING IN MOMBASA.

THE NATIONAL FEDERATION OF BUILDING TRADES' EMPLOYERS OF GREAT BRITAIN & IRELAND.

Half-yearly General Meeting.

The half-yearly general meeting of the National Federation of Building Trades' Employers of Great Britain and Ireland was held in the Balmoral Room, Trocadero Restaurant, Piccadilly Circus, London, on Wednesday, January 27th, Mr. C. H. Barnsley (Birmingham), President of the Federation, presiding. There were also present:—Messrs. H. Marshall, Southampton; R. Hall, Bury; J. A. Tweddle, Tees-side; J. Proud, W. Hartlepool; R. J. Huntley, Sunderland; H. Willcock, Wolverhampton; A. Krauss, Bristol; G. Humphries, Bristol; J. B. Johnson, Liverpool; F. Griffiths, Liverpool; W. F. Drew, Stroud; M. Coltherup, Portsmouth; G. R. Chamberlain, Portsmouth; F. W. Amphlet, Birmingham; S. Ambrose, Bath; W. G. England, Barnsley; J. Davidson, Leeds; S. Easten, Newcastle-on-Tyne; W. Foster, Newcastle-on-Tyne; J. H. Walker, Derby; A. Wright, Derby; B. Talbot, Bolton; F. Woods, Bolton; J. Hamilton, Altrincham; W. Irwin, Leeds; J. Denver, Manchester; N. R. Stirling, Liverpool; E. J. Brown, London; J. Carmichael, London; E. J. Hill (substitute for F. Higgs), London; P. Rhodes, Leeds; D. Williams, Pontypridd; R. W. Moon, Newport, Mon.; T. Hartley, Blackpool; W. R. Thompson, Dewsbury; W. Jewell, Newport, Mon.; W. Cooke, jun., Preston; H. Matthews, Manchester; W. M. Blackburn, Newport, Mon.; G. Macfarlane, Manchester; E. Archer, Northampton; W. Tinker, Manchester; W. Hall, Liverpool; A. S. Smith, Birmingham; F. G. Whittall, Birmingham; H. Erwood, Bath; J. Wright, Nottingham; A. Chambers, Leicester; E. J. Neale, Bristol; W. Wistance, Walsall; S. A. Dove, Leicester; W. Yates, Leicester; W. H. Hope, Sunderland; T. Costigan, London; G. W. Wilson, Leeds; H. Smith, W. Bromwich; H. Lever, Liverpool; — Stokes, Worcester; J. B. Whitehouse, Birmingham; A. W. Chamberlain, Burton-on-Trent; J. T. Armstrong, S. Shields; W. Johnson, Wigan; J. Charles, Newport, Mon.; J. Beggin, Sheffield, W. T. Ledgard, Leeds; C. Dent, York; J. Hardgrave, York; G. F. Leadbeter, Newport, Mon.; A. Mastin, Sheffield; W. Shepherd, London; R. Chambers, Walsall; W. Thomas, Cardiff; J. S. Brown, Liverpool; J. Storrs, Stalybridge; W. Bullen, Liverpool; S. B. Depree, London; T. Wilkinson, Middlesbrough; and the Secretary (Mr. A. G. White).

Notice of Meeting and Non-attendance.

The notice convening the meeting having been taken as read,

The SECRETARY (Mr. A. G. White) announced apologies for absence from Messrs. J. E. Tinline (Bury), W. Marshall (Manchester), J. Marshall (Manchester), W. H. Jessup (Huddersfield), E. Turner (Cardiff), E. W. Wooster (Moseley), E. Wm. Nicholson (Leeds), F. Higgs) (London), H. Moore (King's Norton), and R. J. Hill (Great Yarmouth).

Minutes.

On the motion of Mr. Matthews (Manchester) seconded by Mr. Cooke (Preston), the minutes of the last meeting (printed copies having been previously supplied to the members), were taken as read, and were adopted on the proposition of Mr. A. S. Smith (Birmingham), seconded by Mr. Cooke.

Executive Council's Report, Statement of Accounts, etc.

The CHAIRMAN moved the adoption of the Executive Council's thirty-first annual report for the year ended December 31st, 1908, of which a summary appears as the first item in the Federation monthly reports.

The CHAIRMAN having called attention to several of the items in the report which had been under discussion by the Council at their meeting on the previous day, and explained what had been done in regard to them, moved the adoption of the report.

Mr. G. MACFARLANE (Manchester) seconded the motion.

Mr. W. R. THOMPSON (Dewsbury) called the attention of the meeting to paragraph 23 of the report, referring to the case of a member at York, and said this was distinctly a case to which the National Federation ought to give its support. The sub-contractor was a member of the Yorkshire Federation, but beyond that there was a question of principle involved. That which had occurred in respect of this material might occur in respect of other materials used in the building trade, and other contractors might find themselves placed in the same difficulty as this particular sub-contractor. The course that he would suggest the National Federation should take would be to step in and give its support to the Yorkshire Association, who were moving in the matter. He moved that the National Federation give power to the Administrative Committee to deal with the case as they thought fit after proper consideration. All the facts would be placed before the committee, and the matter could be thoroughly gone into.

Mr. MACFARLANE seconded the motion, and stated that the Yorkshire Federation had promised to furnish the Administrative Committee with all the details and documents.

The motion was carried, and the report of the Executive Council adopted.

The TREASURER (Mr. J. W. White) then moved the adoption of the statement of accounts, and said that the expenses were slightly in excess of the receipts. The contributions from members amounted to about £790, of which £400 came from the Northern Centre, and the balance from other Federations. This showed a diminution of about £60 or £70. The reserve fund showed an increase. There was also a considerable amount outstanding, and he hoped that the members present would see that the various federations kept up their contributions in fairness to those federations which had paid. There was a sum in hand on reserve account amounting to about £700, and he moved that the Administrative Committee be instructed to invest £500 of it.

Mr. JAS. WRIGHT (Nottingham, hon. auditor) seconded. The professional auditor, Mr. Robertson, of the firm of Messrs. Minton, Robertson and Co., chartered accountants, he said, had assured him that the accounts had been duly checked, and were all in order. One matter which arose during the Council meeting the previous day was as to the advisability of members being informed as to the current value of their investments, and it had been arranged that next year this information should be given. Mr. White had said that the expenditure slightly exceeded the income, but he (Mr. Wright) would like to point out that in the past year's accounts there were several items, amounting to £50 and £60, which were extraordinary expenditure. He fully sympathised with the remark that gentlemen in the various federations should see that contributions were duly paid. The Federation ought to have sufficient income to meet its expenditure.

Mr. S. SMETHURST (Oldham) asked whether any statement was forthcoming concerning the Birmingham case (Smithies v. N.A.O.P., see BUILDERS' JOURNAL, January 6th, p. 7).

The CHAIRMAN asked Mr. Albert Smith to reply to the question. Mr. A. S. SMITH repeated the information given in the report, and said that in the event of the N.A.O.P. deciding to carry the matter to the House of Lords, it was stated that they might do so if they deposited £50 as damages by a certain date. That date had expired the previous day, but he could not say whether the money had been deposited.

The motion that £500 of the funds in hand should be put out for investment was carried, and the statement of accounts adopted.

The Recommendations of the Administrative Committee.

The next business was the consideration of the recommendations of the Administrative Committee, which had been endorsed by the Executive Council.

The CHAIRMAN moved the first, namely, "That the resolution of the general meeting limiting the sale of the agreed form of contract to members of the Federation, as passed on July 22nd, 1903, be rescinded."

Mr. SMETHURST seconded, and it was carried.

The next recommendation had reference to the N.A.O.P. agreement. The CHAIRMAN again moved: "That the joint committee as required by Rule 5 be constituted, and that the employers' side of the said committee consist of ten members apportioned as follows:—Three to be elected by the N.A.O.P., four to be representative plasterers elected by the centres, three to be representative general contractors elected by the National Federation."

It having been seconded by Mr. Mathews,

Mr. W. COOKE (Preston) asked whether that was the only outcome of the resolution which had been passed at Birmingham. According to that resolution, a committee was appointed to consider the mending or ending of the agreement with the Association of Operative Plasterers, and report to the annual meeting. Now, he supposed, the only thing they were going to carry out was one clause of the agreement. Why that clause was not carried out at the time the arrangement was come to he could not understand.

The SECRETARY read the recommendation of the special sub-committee appointed by the Administrative Committee, which was to the effect that the complaints which had arisen would probably be satisfactorily dealt with if a joint committee, as required by Rule 5, was constituted.

Mr. J. B. JOHNSON (Liverpool) said that the matter gave rise to considerable discussion at the sub-committee's meeting, and various proposals were put forward. The general impression, however, was summed up by the chairman (Mr. S. Smethurst), who said that the grievances complained of resulted largely from the fact that the joint committees had not been kept in active operation; the remedy was to carry out the rules properly, and he recommended that the joint committee as required by Rule 5 should be agreed to. This was carried, and it was further recommended that the employers' side of the committee should consist of ten members, three of which were to be members of the N.A.M.P., four to be plasterers' representing the centres, and three to be general contractors. That was confirmed by the Administrative Committee, and by the Council on the previous day.

Mr. SMETHURST said the proposals of the Birmingham resolution and those originated by Mr. Johnson had been fully discussed, but it was not considered necessary to take action on any of the individual points raised by Mr. Johnson. There was a difficulty in doing so, because the agreement provided for a joint committee of employers and operatives to deal with grievances which might arise in connection with the plasterers' trade, and this committee had not been formed, and grievances had remained undealt with in consequence. It seemed obvious that before taking any other steps they should get the joint committee constituted to hear any grievances which might be forthcoming; hence the recommendation. Then, if any complaint were made of a breach of the agreement, the case would be reported and investigated, and a decision arrived at upon the facts as presented by both sides This was the unanimous finding of the committee.

Mr. DAVIDSON (Leeds), asked whether the committee had considered the desirability of the operative plasterers becoming parties to the National Conciliation Scheme, and thus bringing them into line.

Mr. SMETHURST said that the operative plasterers had been approached on this matter on several occasions, but they had always declined, being of the opinion that their agreement arrived at in London was preferable to the Conciliation Scheme. It had been suggested that the employers might abrogate the London arrangements, but many of them did not desire that, and so they had taken the only other proper course, viz., to recommend the use of the proper machinery for dealing with the situation. If, however, that were not successful, then they might have to adopt the proposal to abrogate.

Mr. HOPE (Sunderland) asked when was the last occasion the plasterers were invited to come into the scheme. He knew that, in the North of England, there was a disposition to come into line, and he would like to know whether there had been any lately to bring them into the scheme.

The SECRETARY: They were invited last year, but for a second time they replied that they could not depart from their original attitude. I have seen their secretary, but they prefer the old agreement.

Mr. COOKE said that of course he would accept Mr. Smethurst's explanation, but he could not help expressing surprise that an agreement which had been in operation for some time had not had one of its vital principles carried out. Along with the National Committee, local committees had to be formed to consider cases in their districts, and then if they did not agree they had to be sent to the National Board. They were formed in many towns, yet the higher tribunal to which they had to appeal was not existing.

The recommendation was then put to the meeting, and carried.

The CHAIRMAN proposed, *re* the individual members of the National Federation, "That every individual member who pays £2 2s. per year subscription should become entitled to one year's free supply of the official journal, the account for this to be sent to and paid by the Federation."

Mr. SMETHURST seconded. He did not think, he said, that the object of this recommendation was very clear to the Council, but it was the opinion of their secretary that it would prove a means of propagating the membership of the Federation. In certain parts of England, which were very rural in their nature, it was exceedingly difficult to get anything like organisation. The southern counties had only a few towns containing members of the Federation, and were scarcely in a position to run an effective organisation. The secretary thought, therefore, that this recommendation might obtain an increase of individual members who would subsequently form the nucleus of federated associations. He (Mr. Smethurst) thought the scheme was a good and wise one, and he had great pleasure in seconding the proposal. It would admit members, where there was no association in their district, as individual members at a subscription of two guineas, carrying with it a copy of the official journal, which helped considerably the objects of the Federation.

Mr. GREENWOOD (London): Are there no individual members at present?

Mr. SMETHURST replied that there was only one in the Federation.

Mr. GREENWOOD asked if there were any rules which applied to such members, and what was the subscription.

The SECRETARY replied that there was a rule which applied to such members, and that the subscription was two guineas.

Mr. GREENWOOD: The proposal is, then, that there is no alteration in the provision as to the introduction or the subscription of individual members. All that is proposed is to give them a copy of the "Journal" without any increased subscription.

Mr. HOPE said that there were also individual members of various federations throughout the country in districts where there was no association. In such cases these individual members were in the same position in regard to local federations as those particular members were in regard to the National Federation.

Mr. DAVIDSON asked whether it was possible for any individual member to become associated directly with the National Federation if that member was in the area of a county federation.

The CHAIRMAN: No. They join through the latter.

The recommendation was carried.

Mr. STORRS (Stalybridge) next moved the following recommendation in regard to the application of builders' labourers for admission to the Conciliation Scheme:—"That this committee recommend that the application of the builders' labourers for admission as parties to the National Scheme of Conciliation be not acceded to, but that builders' labourers be allowed to join local conciliation boards where the employers and skilled operatives are in favour of such a course, provided that the agreement under which they are so admitted shall clearly state that their admission is purely optional and not of right, and shall further provide that no labourer representatives shall sit on the Centre or National Boards to adjudicate on cases from towns where the labourers' union or unions do not receive recognition, and shall only sit on local boards when matters affecting their interests are concerned. That where a labourers' union is admitted into the local conciliation board of any district, and a dispute arises which the local board cannot settle, a joint application by the parties concerned for their case to be heard by the Centre and National Boards shall be granted, provided both applicants agree to accept the decision of either of these Boards, and to pay all expenses of the hearing or hearings. That the above resolutions be duly communicated to the National Board." Mr. Storrs explained that application was made by some of the societies of labourers for admission to the conciliation scheme. When that matter was under discussion, it was found that great differences of opinion existed with regard to it in various parts of the country. Some districts, particularly in the Midlands, had recognised rules relating to builders' labourers, and would naturally like to join in the benefits of the conciliation scheme. There were other districts where labourers were not recognised by any of the master builders' associations, and especially was this the case in Lancashire and Cheshire. He thought it was very desirable, in all places where builders' labourers were recognised and had copies of rules signed between themselves and their employers, that they should be allowed to participate in the benefits of the conciliation scheme; but owing to the wide difference of views held in the various parts of the country, it was impossible to agree to their admission to the full benefits of the scheme. The Administrative Committee, therefore, had decided to recommend the resolution he had just submitted to the meeting.

Mr. DAVIDSON seconded. He did so, he said, in order to ask whether, before going before the National Board in case of a dispute, some representation could not be made to carry out the spirit of the rules. In Yorkshire many operatives' societies were prevailed upon to bring cases in dispute before local authorities. That was a direct breach of the letter and spirit of the rules. The conciliation rules stated that all matters in dispute should be brought before a conciliation board. One of the very societies desirous of benefiting in this matter took what they considered a breach of the fair wages' clause before the local corporation, and a committee of that authority considered the matter for some time, and heard evidence. They finally, however, passed a resolution that no such breach had been committed. In spite of this decision, the next thing the society did was to ask that the local conciliation board should be called upon to deal with the same matter. They were told, however, that all such matters of dispute should have been referred to the conciliation board in the first instance. They had chosen to take it first before the corporation, and the conciliation board would not now entertain it. It was a matter of principle, and he strongly urged that all associations brought into line with the National Conciliation Scheme should be given definitely to understand that there was no right to appeal to any court until the Conciliation Board had first heard and determined upon the matter in dispute.

Mr. STOKES (Worcester) said that ever since the conciliation board was formed for his district, they had had representatives of the Labourers' Society upon it. These representatives had always attended the meetings of the board, and had always been good men to deal with. He did not know whether their admission to the board was a breach of the rules, but the arrangement had worked very satisfactorily.

The recommendation was agreed to.

The last recommendation of the Administrative Committee was the consideration of amendments proposed by the Northern Centre to the Conciliation Board rules.

Mr. MACFARLANE, dealing with the first proposal, said the suggestion was to add to Rule 2, after the words, "If, however, the principal place of business of the contractor is not situate within the district covered by the local conciliation board," the words, "or should a dispute arise on a job of an employer outside his own town or district," and then continue, "it shall be competent for him to demand that the case shall be heard by the Centre Conciliation Board of the district where the work is performed, in lieu of the local conciliation board," etc., to end of rule. This alteration, continued Mr. Macfarlane, was passed at the Council meeting on the previous day, and the effect of it would be to widen the scope of the rule without in any way altering it. He moved that the alteration be adopted.

Mr. BLACKBURN (Newport) seconded, and it was carried.

Mr. MACFARLANE proposed the next alteration, viz., in Rule 13 (regardng the decision of voting), the insertion of the words, "But should there be cross-voting the decision shall be given in favour of the side securing at least two of such cross votes," etc., etc. At the present time, said Mr. Macfarlane, one cross-vote carries a decision. It was considered by those who proposed the insertion of the words that if the arguments from one side convinced only one man, and so altered the decision of the Board, it could hardly be called a conciliation board. For his own part, he believed that if one-half of one side failed to agree with the decision of all the members on the other side, it was not a proper conciliation. They had cases where it was considered that there was a miscarriage of justice by reason of the fact that mistakes had been made owing to one individual voting along with the operatives, and carrying the decision with him without thoroughly realising the true position of the matter. This sort of thing had received not only the disapproval of the masters, but also of the operatives. Cases which had been decided by what might be called this "scratch voting" had been immediately brought up again for further consideration. They had two such cases in Lancashire which were likely to cause a great deal of friction. There could be no lasting conciliation if, immediately after a "scratch vote" of this kind, the losing side were filled with a burning sense of injustice. They thought, therefore, that the rule should be altered. If the arguments coming from one side were not sufficient to influence more than one on the other side, then they could not be very weighty, and it was not fair that such arguments should be sufficient to impose hardship on a side which considered itself unjustly dealt with.

Mr. THOMAS (Cardiff) seconded, and said he was guided in his opinion by the decision of a conciliation board appointed to deal with a dispute between masters and men in

Mr Barnsley proposes the Election of his successor

The New President expounds his pet project

Mr Ernest J. Brown submits to the inevitable

A veteran ex-president

Mr Shepherd deals with the report of the E.P.C.

A corner in Tobacco

Mr Macfarlane pleads for two cross votes

SKETCHES AT THE NATIONAL FEDERATION MEETING: BY OUR SPECIAL ARTIST.

the Welsh coalfields, and in that case if two or three cross-votes had been necessary, the decision would have been very different from what is actually was.

Mr. SHEPHERD (London) said there had been circulated in the room that morning a report of the proceedings on the previous day, and he thought it was only fair that he should state his views with regard to the matter. His view was that if two parties sat down to hear and consider the merits of any dispute between them, when they voted upon it a bare majority should decide the question, otherwise conciliation became a mere farce. In the case instanced it appeared that the decision had been given against the employer; but with their conciliation board in London they had had numerous cases where decisions had been given against the employer.

Mr. MACFARLANE: By one vote?

Mr. SHEPHERD: By a majority.

Mr. MACFARLANE: That is another thing.

Mr. SHEPHERD said they did not count the votes; he could not say whether it was one or two or three, but it certainly could not be many. (A voice: We don't want "many.") Was it to be assumed by impartial and unprejudiced persons that in the case of every dispute which arose the operatives were absolutely in the wrong? He contended that when the questions in dispute were debatable points, where evidence had been adduced by both sides, the matter had been thoroughly thrashed out, and a vote taken, the majority on that vote, whether it was one, two, three, five, or six, should decide the question. He failed to see what advantage would be gained by making the majority two. If the one side were dissatisfied with the decision arrived at, it was not likely that it would be more content because that decision was arrived at by a majority of one instead of two.

Mr. MACFARLANE: There is less chance of a mistake.

Mr. SHEPHERD: I don't think so.

Mr. MACFARLANE: But we know it.

Mr. SMETHURST said they were always very grateful for the opinions Mr. Shepherd might give them, because that gentleman brought the most mature judgment to bear on all questions he discussed; but it was only fair to mention that the London Association was not a party to the conciliation boards, and consequently had no knowledge of their working. What might appertain to London might not in the same degree appertain to the conciliation board elsewhere. Some alteration in the present system was necessary, and he believed the operatives felt the grievance as keenly as they did. The danger of the existing system of voting was of giving a decision contrary to all the facts, which tended to create a considerable grievance in the town where the judgment had been given against them. He had such a case in mind; and while the town in question loyally accepted the verdict, they had given notice to have it reversed through an alteration of rules at the earliest opportunity. Mr. Shepherd argued that these conciliation boards were in the nature of individuals coming with open minds to discuss the matters under consideration. That, however, was not the case at all. The parties came with the full intention of securing their own ends, or as much as they could. In his experience, the other side always came with a solid front, determined to grasp every point which might arise in their favour during the discussion. They, the masters, however, were not so well organised, nor had they got that solidarity which signalised the operatives. They were unable to argue their cases so efficiently or with such precision. It therefore sometimes happened that one member of the board, not understanding the merits of the case, gave his vote out of the kindness of his heart to the other side, and so turned the decision against himself and his colleagues. Again, there were men in the Federation who declared that they would vote on these boards just as they liked. They would simply go in and give their opinion, and so upset their colleagues on the issue. On the other hand, a great many decisions of conciliation boards had been arrived at by one side giving way to the other when the facts before the board were obviously in favour of their doing so, and many compromises had been reached by the sense of fairness felt on one side or the other. If, however, a case occurred in which neither side felt disposed to yield, because, perhaps, a principle was involved, then, having exhausted the resources of the conciliation boards, the parties could fight. These boards did not pretend to do away with the right of fighting out the issue. That was a condition of things which neither masters nor men desired to see changed; but what the Federation wanted to make sure of was that, before a dispute reached such a pass, all possible chances of a conciliation by compromise and by weighing thoroughly all the facts, were exhausted. The best way of making quite sure of this was to increase the number of cross-votes. Such a proposal did not destroy conciliation, but rather it strengthened it, and he was sure it would be readily accepted by the men who were most seriously concerned with conciliation cases.

Mr. HOPE said they had had the mature judgment of Mr. Smethurst on the one hand, and the equally mature judgment of Mr. Shepherd on the other. It was a question of expediency, and there was no balance of advantage one way or the other. If they were to look, however, at the working of the conciliation boards throughout the country, they would find that many satisfactory decisions had been given, and very few unsatisfactory ones.

Mr. MACFARLANE: By a majority of one?

Mr. HOPE: Don't anticipate me.

Mr. MACFARLANE: I can ask a question.

His point was, continued Mr. HOPE, that if they were prepared to come and tell him that most of the decisions which had been arrived at by a majority of one, and were disadvantageous, then he was prepared to be guided somewhat by their arguments; but that was not the case. The bulk of decisions given by the conciliation boards were secured by a majority of one, but were also advantageous, satisfactory, and likely to be permanent in their results. The only reasons which had been given in favour of the proposed alteration were of the same character as that put forward by Mr. Macfarlane, who had said that mistakes had been made in the past. Surely, however, they could not be asked to seek alterations in the rules because they themselves had been guilty of mistakes. They had been told that the operatives put their cases before the boards with more efficiency, and that on their own side men came who were not competent to exercise their judgment. Well, the remedy for that was to be more careful in their selection of men to represent them on the conciliation boards. When cases occurred of a decision going against them owing to the action of one man, it should serve to bring them to their senses, and induce them to send men competent to form a sound judgment, and give a proper decision.

Mr. STORRS said there were two parties to the scheme, and whatever might be the opinion of the majority in that room, it did not follow that that opinion would meet with acceptance by the other side. He had been associated with the conciliation scheme since its inception, and he was not in favour of the whole scheme being jeopardised by the alteration of the system of voting. If the other side could be persuaded to accept a majority of two cross-votes, he would not be opposed to it, but he wholly failed to see, in view of the decisions in the past, why members should be so much concerned in the matter. In the majority of cases before the conciliation boards they had come out on top. There had been cases where one of their own side had voted the other way and upset the decision, but was that the fault of the system? They must not expect that they were always going to get conciliation from the other side without ever advancing any from their own. If the matter went as far as a conference with the operatives, and he found that the whole scheme was likely to be jeopardised by forcing on the proposal of two cross-votes, he should certainly vote in favour of a bare majority.

Mr. THOMPSON referred to the later amendment, by which the parties would be allowed to retire and discuss the merits of a case before a board after having heard the facts. He believed that such a private consultation before coming to a conclusion would obviate the necessity of the proposed alteration in the voting.

Mr. SINCLAIR (Scarborough) said that Mr. Shepherd had said that the majority must rule, and he thought every member in that room would be prepared to agree with Mr. Shepherd on that matter. The gentlemen, however, who were proposing the alteration were men intimately connected with the conciliation boards, and their action was prompted by their experience. They found that there were defects in the working of the scheme, and they came to that meeting with a remedy. By making the majority of cross-votes larger, every member of a board would secure a scope for his individual judgment which at present he did not possess. Both operatives and employers very naturally wished to do fairly and justly on these boards, but when they would like to exercise their free and unbiassed judgment on one side or the other, they hesitated to do so, because one cross-vote would turn the whole decision. They found by experience that the system placed a restricting influence upon the judgment of members of conciliation boards. They had had more than one mistake owing to this system—mistakes which were not intentionally made. There was no appeal from the decision of a conciliation board, and they had had decisions arrived at in this way which had had most far-reaching effects upon the whole district. They pressed for the alteration, because their experience has shown them that it would be in the best interests of both employers and operatives.

Mr. WILKINSON (Middlesbrough) said that they had generally arrived at a unanimous vote in his district after a conference between the two sides. The decisions which had given rise to the question which the meeting was called upon that day to decide were decisions which need never have been arrived at at all. In one instance, where a rise of ½d. in wages was given, the operatives would have been delighted to vote along with the masters for a rise of ¼d. The men in that case were rather seeking re-arrangement of the time in the district than a rise of wages. They, therefore, came to get a question settled which was not really before the board.

Mr. SMITH said he spoke against the resolution at the Council meeting, and also voted against it, and he felt that he would have to take the same course again now. He did so because these conciliation boards had not been working for very long, and the time was comparatively too short in which to judge them. It was not advisable, therefore, to tamper with their working unless the case for doing so was very strong indeed. Personally, he did not think that the case was strong enough. Mr. Hope had hit the nail on the head when he said that the men sent to these boards should be men competent to form a sound judgment, and come to a fair decision on the facts and evidence placed before them. This suggestion for an alteration came from the North, and they had heard of several cases where a vote given by one of the masters in the North had affected adversely the question before the meeting. Later on a proposal would be moved which would give members of the conciliation boards the right to private consideration before a final decision was taken, and if that were carried, he thought it would cover the present question. The fact that mistakes had been made in the North was really not a sufficient reason to tamper with a system which had worked very well in the Midlands and in the South. In his own district they had never had a case of a master giving his side away, and it was not worth altering the rules because the hard-headed men in the North sometimes possessed soft hearts.

Mr. BULLEN (Liverpool) said Mr. Smith was evidently not aware that in the decision which had given so much cause for complaint the employer who voted for the men came from as near the Midland end of the district as was possible. Mr. Hope had said that the only reason which had been given for the proposed alteration was that mistakes had been made. But that was not all. These mistakes had certainly given rise to considerable agitation, but there was a far greater reason for the change than that. By some of the arguments which had been forthcoming, and especially at the Council meeting the previous day, one would imagine that this conciliation scheme was a heaven-sent scheme which was quite impossible of improvement. He noticed particularly that the gentlemen who spoke on this matter, and had so much to say in favour of the existing system, came from districts where the Conciliation Board had never held any meetings, and where the argument one way or the other did not apply. The promoters of the alteration came from the North, where they had had so much experience of the working of the present system and its bad results that they were getting sick of it. In fact, if it were not improved, most serious results would accrue to the Federation. In the Lancashire and Cheshire districts one association had already severed its connection with the Federation because of a "scratch decision" of a northern centre conciliation board. He was at the present time using every endeavour to get them back into the fold. There was another case of a most important association, which was finding some 25 per cent. of the income of the Lancashire and Cheshire Federation, and which had threatened to sever its connection with the Federation because of its experiences with the conciliation scheme. They declared they had had enough of it, and unless it could be improved, their only course was to withdraw from the Federation. These were serious matters, and unless the scheme was revised they would continue to be faced with them. Members had remarked that the conciliation boards must not be reduced to a farce. He quite agreed with those gentlemen, and the very idea of the proposed alteration was to raise them from the farce which these boards had become at the present time. It was surely absurd to suppose that a scheme which had only just been started was impossible of improvement. He was quite sure that it could be improved, despite the "wiseacres" who had come there that day to tell them that the scheme was already absolutely perfect. There was nothing perfect on earth.

Mr. STOKES said he objected very strongly to the proposed alteration. He had had experience of the conciliation boards, and if it were rendered impossible to get a decision by a bare majority of one, it might often mean that the board would have to meet again the next day, and another day's business would be lost to all the members present. For this reason he opposed the alteration on behalf of himself and his colleagues in the Midlands.

Mr. IRWIN (Leeds) remarked that a great deal had been said about "scratch votes." He objected to the words. He refused to bind himself, before going to a meeting of a conciliation board, to the way he was going to vote. If he were not competent to sit on a board without making up his mind beforehand, then he would not sit on the board at all. He also protested against the idea of holding a meeting before the board sat. He should oppose the alteration.

Mr. MACFARLANE said that Mr. Shepherd had spoken purely from the London point of view. He had, therefore, had very little to do with the National Conciliation Scheme, and that gentleman's experience should not be counted against the experience of actual members of conciliation boards who desired the alteration.

Mr. SHEPHERD: The principle is the same.

Mr. MACFARLANE: I wish to speak on the broad question of results. No member of the Northern Federation wishes to make these boards simply automatic machines; our desire is to keep them as conciliation boards. It is a question of justice and fair play to the towns affected by the decisions arrived at. Not only is the town in which a wrongful decision is given affected, but it affects other towns in the same area. Generally the question before the concilation boards involves a dispute about wages; and where injury has been done by the decision of a conciliation board, it invariably has been in the direction of higher wages. Mr. Storrs has said that he would not jeopardise the success of the conciliation board scheme; neither would I, but let us get our machine in the best working order. This matter is a serious one, and it affects the well-being, I may almost say, the life, of the Federation. (Cries of "No! no!") You may say "No! no!" but we who have had experience know better. We know that associations in the north have been killed by decisions of conciliation boards, and the greatest difficulties are threatening because of them, and if you who have no trouble are so hard hearted as not to give way in the matter, the position will be a serious one indeed.

The meeting then proceeded to vote on the proposed alteration, with the result that it was lost by the narrow margin of thirty-five votes to thirty-eight. The CHAIRMAN announced the figures amid loud cries of "scratch vote," and applause.

The following new rules were then proposed by Mr. MACFARLANE and carried:

Period for which a decision shall endure. —"That it shall be the duty of every Board of Conciliation when giving a decision to take into consideration the desirability of stating a minimum period for which such decision is to endure."

Private Consultation at Board Meetings. —"That should either side desire to retire for private consultation during the sitting of any of the Boards after hearing the evidence, they shall be allowed to do so."

Mr. SMETHURST asked whether it would be competent for them to go forward and discuss the above matter at the meeting of the conciliation board, which was to be held in May, and which would include both employers and operatives, and whether they could take a verdict upon it. He pointed out that under rule 19 of the Building Trades Conciliation Boards any party desiring an alteration of the rules should give six months' notice in writing to the joint secretaries of the National Board prior to the annual meeting, and that such notice should at once be communicated to all parties to the agreement, and the National Board should have power to alter the agreement by a majority of votes of those present at the annual meeting. That notice, he said, had been duly given, and it would be under the consideration of both parties. The northern centre had given notice through the secretary of the Federation, and it would be circulated as an amendment to the rules. As he understood, the Northern centre would be able to go forward with that proposal, despite the vote just given.

The CHAIRMAN said he saw no reason why it should not be discussed.

The SECRETARY, in answer to a question, said that due notice of the alterations had been given to both himself and the operatives secretary.

Mr. WRIGHT (Derby) thought Mr. Smethurst's contention was perfectly correct. The vote which had just been taken only affected the National Federation. The Northern centre could act independently.

Mr. STORRS said that if the National Board met, and one side voted solid for the alteration and the other against it, the proposal would fall to the ground, because their Federation, which was really the head of the Conciliation Board, did not give the requisite consent.

The CHAIRMAN: That is the way I take it.

Mr. MACFARLANE: There is a provision in the rules for the alteration of the rules by members of the Conciliation Board. We wanted the authority of the Federation behind us, and we have got it by thirty-five votes to thirty-eight. (Loud laughter.)

The matter then dropped.

Election of Executive Council, &c.

The Secretary announced the following elections for 1909:—

Executive Council.

Elected members:—*Northern Centre.*—Northern Counties Federation: Messrs. T. Wilkinson, Middlesbrough; S. Easten, Newcastle-on-Tyne; John Proud, West Hartlepool. Yorkshire Federation: W. R. Thompson, Dewsbury; W. G. England, J.P., Barnsley; A. J. Forsdike, Sheffield; W. T. Ledgard, Leeds; J. Biggin, Sheffield. Lancashire and Cheshire Federation: T. Hartley, Blackpool; Jas. Storrs, J.P., Stalybridge; H. Matthews, J.P., Manchester; W. Johnson, J.P., Wigan; J. Hamilton, Altrincham; W. Tinker, Manchester; J. B. Johnson, Liverpool; W. Bullen, Liverpool; W. Cooke, junr., Preston; J. E. Tinline, Bury; F. Woods, Bolton. *Midland Centre.*—Arthur Chambers, Leicester; F. G. Whittall, Birmingham; F. A. Fish, Nottingham; J. Barnsley, J.P., Birmingham; W. Winstance, Walsall; H. Willcock, Wolverhampton; A. S. Smith, Birmingham; H. Smith, West Bromwich. *South-Eastern Centre.*—London Federation: Wm. Lawrance, London; J. W. Lorden, London; T. Gregory, London; F. L. Dove, L.C.C.; F. Maitland May, London; J. Carmichael, London; S. B. Depree, London; A. W. Turnbull, London; F. G. Rice, London; Fredk. Higgs, London. Eastern Counties Federation: J. Bell, J.P., Cambridge; Great Yarmouth president. Southern Counties Federation: W. F. Wallis, Maidstone; H. Marshall, Southampton. *South-Western Centre.* — South-Western Federation: H. Passmore, Exeter; E. W. Wooster, Bath; E. J. Neale, Bristol; W. P. Lewis, Hereford; W. F. Drew, Stroud. South Wales Federation: W M. Blackburn, Newport, Mon.; J. E. Turner, Cardiff; D. Williams, Pontypridd. Dublin: R. Denne Bolton. Belfast: R. B. Henry, J.P. Scottish representatives (honorary members): Hector MacVinish, Inverness; Jas. Leslie, Aberdeen. Representatives on the Employers' Parliamentary Council: The President (Ernest J. Brown, London), and Wm. Shepherd, London.

National Board of Conciliation.

Nominations for the National Board of Conciliation were received, and the following election made; members to take office in May next:—*Northern Centre.*—Northern Counties Federation: Messrs. T. Wilkinson, Middlesbrough; J. W. White, Sunderland. Yorkshire Federation: A. W. Sinclair, Scarborough; J. Biggin, Sheffield; W. R. Thompson, Dewsbury. Lancashire, Cheshire and North Wales Federation: Jas. Storrs, J.P., Stalybridge; S. Smethurst, J.P., Oldham; George Macfarlane, Manchester. *Midland Centre.*— J. Barnsley, J.P., Birmingham; J. H. Walker, Derby; H. Willcock, Wolverhampton; J. H. Kellett, Leicester; A. Brazier, Bromsgrove. *South-Eastern Centre.*—H. Marshall, Southampton; J. Bell, J.P., Cambridge President. *South-Western Centre.*—Wm. Thomas, Cardiff.

The Parliamentary Council's Report.

The report of the Employers' Parliamentary Council for 1908 was presented. In this it was stated that the operations of the Council during an exceptionally protracted Parliamentary year were, with one important exception, confined to watching the proceedings in connection with, and resisting the progress of, various Bills containing provisions which were either detrimental to employers' interests, or which sought to establish new arrangements in the conduct of industrial undertakings that would be prejudicial to trade and labour. The exception was with respect to the Coal Mines (Eight Hours) Bill—a Government measure, brought in at the instance of the Miners' Federation, to provide for a compulsory eight-hours day in coal mines. The Council held special meetings to consider the Bill, and resolved to co-operate with the Coal Consumers' Defence League in opposing this measure, which would result in a heavy burden being placed upon the whole coal-consuming community, to say nothing of establishing the principle of State interference with the hours of labour of full-grown men, and of proving a sure stepping-stone to legislation to regulate hours and wages generally. The Council did everything in its power to encourage opposition to the Bill, which, however, was allowed to pass into law with only a slight amendment which will have the effet of extending the working day by about half an hour on the average. It is further recorded that in the Parliamentary session which began on January 29th, 1908, and ended on December 21st, 1908, the Executive Committee issued weekly to the chairmen and secretaries of employers' associations, Members of Parliament, and others, a list of Bills opposed by the Council, showing the purpose of each Bill, the Council's objections to the Bill, the names of Members of Parliament introducing it, and the stage reached. During the Session, constant communication was kept up with Members of Parliament favourable to the views of the Council, and to those Members the best thanks of employers are due for their courteous co-operation with the Council on all occasions when it was necessary to give effect to the Council's opposition to these measures. It is satisfactory to be able to report that many of these measures, having been persistently opposed, were defeated, dropped, withdrawn, or lapsed owing to the Prorogation intervening. The Council, having been supplied with a summary of the evidence offered by workpeople to the Parliamentary Fair Wages Committee, carefully considered the demands made in this document, and sent to the Committee a memorial in reply, in which a protest was entered "against the idea that 'the trade-union rate of wages,' as such, should be considered as in any way binding upon a contractor. . . . To require any contractor to pay the trade union rate of wages simply because it is the union rate is to hand him over gagged and bound to a small body of men who could easily ruin him if they wished to do so. The further suggestion, that a firm which may have removed its factory 'to a more or less rural district' is to be forced to pay the trade union rate current in the nearest town, is still more monstrous. Many firms have gone to very considerable expense in the last few years for the purpose of establishing their works away from big towns; and the conditions suggested really mean that their expenditure in this respect is to be thrown away by their being deprived of one of the main advantages of working in a rural district." The subsequent report of the Committee shows that the Council's representations, especially on the question of forcing employers to pay the trade union rate of wages, have not been without influence.

Mr. SHEPHERD, in moving the adoption of the report, said that the kernel of it was contained in the introduction. If members would read it, they would realise the difficulties which were experienced, through the political position of the present day, in getting proper consideration of any of the principles which were involved in legislation or the consideration of the interests of persons affected by legislation. The one idea which seemed to pervade both political parties at the present time was the means by which they could secure votes for one party to remain in power and the other party to displace them. In the meanwhile, the interests of the general public were absolutely ignored and sacrificed. Those present would remember that last year the Trades Disputes Bill was before Parliament. The Employers' Parliamentary Council interviewed the Opposition members of the House of Lords, who expressed themselves as antagonistic to the proposals and principles involved in the measure, and when the deputation retired they had every reason to believe that when the matter came before the House of Lords they would give effect to their convictions. Instead of that, the Lords, for reasons of political expediency, allowed the Bill to go through! The same thing had occurred with regard to the Miners' Eight Hours' Bill. Every leading member of the Opposition expressed adverse opinions on the Bill; but when they had to decide the question, they simply said: "We will make the present Government responsible for a proposal which is so detrimental to the interests of the general public, and will assist them to bring it into operation!" He had referred during the meeting to something being a farce, but surely legislation under these circumstances was an absolute farce.

The CHAIRMAN: A political farce.

Mr. SHEPHERD, continuing, said that the questions before Parliament were not determined upon the basis of principle in any sense. He was sorry that they, the Parliamentary Council, had not been more successful in their efforts to prevent the passing of legislation which was detrimental to the true interests of the country. But they had done their best under the circumstances, and he had no doubt that, if they had not entirely achieved their objects, they had to some extent ameliorated legislation, which otherwise would have been more prejudicial than was actually the case. At the end of the report they would see a number of Bills, private and public, which had been brought forward, but which, owing to the daylight which had been thrown upon them and the subjects upon which these Bills proposed to legislate, had not succeeded in becoming law. It behoved the Council, however, not to relax their efforts in procuring the legislation they desired, because if they did they would be simply allowing things to go by the board. If there was no interest taken in upholding the rights and liberties of every individual in the community, and in opposing detrimental proposals, things would sink back to a far worse state than they were in at the present time. He would recommend them to read carefully that portion of the report which dealt with Fair Wages Committee. Upon that report the Employers' Parliamentary Committee made strong representations to the Secretary of State. These, and other representations, were considered, and some mitigation was obtained. The character of the Bills opposed by the Council was quite sufficient to justify that opposition. There was no doubt, however, that all those Bills would be revived; and unless some very exciting matters came before the House of Commons, they might be pushed forward, together with many others which would be promoted in the ensuing session of Parliament. Whether the great question of the House of Lords was going to absorb the whole time of the House of Commons, he did not know, but to an outsider like himself the idea seemed an absurdity. The Employers' Parliamentary Council, however, made up as it was of representatives of nearly all the industrial corcerns in the country, would continue in its endeavours to justify its existence.

Mr. RHODES seconded, and said they all thanked Mr. Shepherd for the able way in which he looked after the interests of the building trade as a member of the Employers' Parlimentary Council. He asked whether any steps had been taken in the matter of the representation of employers of the Federation on the panels of the new Arbitration Court.

Mr. SHEPHERD replied that the Council would continue to press the matter. They had made representations to the Board of Trade, and they would not relax their efforts.

The report was adopted, and votes of thanks were passed to Mr. Shepherd, Mr. C. H. Barnsley, and Mr. Greenwood for their services on the Parliamentary Council.

Election of President.

Mr. C. H. BARNSLEY proposed the election of Mr. E. J. Brown (London) to the presidential chair for the ensuing year. It was not necessary, he said, for him to employ many words in recommending Mr. Brown to that position. He had passed through the chair of the London Master Builders' Association, and that was an office which required a man of wide experience. Mr. Brown was a man of energy and enthusiasm, which were very important qualifications for the chairman of such a Federation as theirs, and moreover he possessed great commensense. They all knew the active part he had taken in reference to the BUILDERS' JOURNAL. Although the Journal Committee did its very best, Mr. Brown personally interested himself in the early negotiations, which he was sure they would all agree had been brought to a successful issue. He had no hesitation in recommending Mr. Brown with perfect confidence to fill the presidency for the ensuing year.

Mr. STORRS seconded, and Mr. Brown was unanimously elected to the chair.

Mr. Barnsley having vacated the chair in favour of the new president, and placed upon him the chain of office,

Mr. BROWN returned thanks for his election. He thanked the meeting for the cordial way in which they had elected him to the office, and assured them if he could only live up to one-half of the kind things Mr. Barnsley had said of him he should be a proud man. It was true he had been "through the fire" in London, but if he had not been through it he would never have been in a position to accept the proud distinction of the presidency of their Federation that day. He thought the arrangement they had in the Federation and in most of its centres which rendered it impossible for a man to leap suddenly into a high position from the ranks was a most excellent one. It was only right that a man should work up step by step, because then when he finally obtained the honourable position which he himself held that day he felt more able to grapple with the duties he had to carry out. Federation was a difficult thing to learn. None of them knew what it really meant yet; but they were learning more and more every day. There were many things connected with the Federation which to his mind were burning questions, and first of all came the question of organisation. It was an easy thing for them to sit there and attempt to preach the gospel of organisation; but to carry out the propaganda and work to that gospel was another matter altogether. There were some parts of the country which were gradually sliding away not only from Federation but from Association work. He considered that a most deplorable state of things; and it was the first duty of the Administrative Committee to take up seriously the question of how to bring these parts of the country back to the fold. In this connection he especially referred to the southern and south-eastern districts. How it was to be done was truly a difficult question; but the Administrative Committee must use every means in their power to bring about the desired result. He could not sit down without reminding the meeting of his pet scheme—the journal. Twelve months ago he had the pleasure of introducing the BUILDERS' JOURNAL at that table, and he threw out a mild suggestion at the time that there was something ready-made for the Federation instead of laying down their tools of the building trade to take up those of the printing trade. In the BUILDERS' JOURNAL they had a ready-made paper with all the appliances and appurtenances at hand—a paper which could represent them in every possible way. After many negotiations and much argument—not many lawyers he was glad to say—the scheme was carried through, with the result that the Federation now had its journal. (Applause.) It would not do for them to think, however, that by the mere fact that they had secured a paper to represent them that was going to make a success of their journal. He hoped that not only would members of the Federation subscribe to the paper, but that they would also induce their friends to subscribe; that they would also advertise the paper in every possible way, and make people understand that it was a channel through which business was to be obtained. Reports of all they said and did would appear in this journal; and the knowledge made one somewhat careful and nervous of what he did say. He could not help recalling the words of Robert Burns:

> "If there's a hole in a' your coats,
> I rede ye tent it;
> A chiel's amang ye takin' notes,
> And, faith, he'll prent it!"

Mr. Macfarlane would tell him that was not Scotch.

Mr. MACFARLANE: You're aiming at it!

Continuing, Mr. BROWN said he hoped the journal would be taken up this year with more enthusiasm, and he hoped the local secretaries would put their shoulders to the wheel to make the scheme go. If it did, he would look forward to the time when they would not have to subscribe, but when it would pay for itself out of the profits, and put a substantial sum by in the reserve fund into the bargain. Passing on, the speaker said that when he looked at the chain he was now wearing and read the names engraved upon it, he could not help feeling that they owed great thanks to those who had preceded him. The Federation had been supported in the past by strong men, many of whom he was glad to say still remained with them in the Federation. He was perfectly certain that so long as they had such men among them and were able to profit by their counsel, they could not go far wrong. He urged those present to make it their earnest endeavour to serve the Federation as well, if possible—they could not do it better—as those who had preceded them, whilst for himself he would do his utmost.

Mr. STORRS proposed a vote of thanks to Mr. Barnsley for the efficient manner in which he had presided over them during the past year, and he moved that that gentleman's name should be added to the list of honorary vice-presidents.

Mr. MACFARLANE seconded, and the motion was unanimously carried.

Mr. BARNSLEY, in returning thanks, remarked that he had always endeavoured to do his best in the interests of the Federation, and would continue to do so.

The following officers were also elected:—Senior vice-president, Councillor S. Smethurst, J.P., Oldham; junior vice-president, J. W. White, Esq., Sunderland; hon. treasurer, James Wright, Esq., Nottingham; hon. auditors, F. Higgs, Esq., London, W. Thomas, Esq., Cardiff. Representatives on the Employers' Parliamentary Council, E. J. Brown, Esq., London, and Wm. Shepherd, Esq., London.

Next Half-yearly Meeting.

On the invitation of the president of the Portsmouth Association, it was decided to hold the next half-yearly meeting at Portsmouth.

Other Business.

The SECRETARY explained that there was other business before the Council on the previous day which did not appear on the agenda, as it came to hand too late to be printed. It might perhaps be convenient to the members if he briefly stated what the business was. There was a report about the National Form of Contract. It would be remembered that at the last half-yearly meeting resolutions were passed with regard to extending the adoption of the agreed form of contract, and to approach the R.I.B.A. in the matter. This had been done and a report had been made, but the President had reported that there was an amendment under discussion between the Builders' Institute and the R.I.B.A. as to clause 30 of the contract. The Council, therefore, decided that the suggested action as to circularising the various public bodies with regard to the use of the contract should be temporarily suspended. Mr. Hope had suggested that the Administrative Committee should consider how the contract had worked, and whether amendments from the builders' side were required. He (Mr. White) understood that Mr. Hope's suggestion amounted to this: that they were to ask for a report from the Federation as to any experience which they thought should lead to an amendment of the contract, and that the Administrative Committee should consider any reports received, so that action could be taken while clause 30 was on the tapis. Further, it was decided to ask the Builders' Institute not to arrive at any decision on clause 30 without first consulting the Federation. The International Trades Exhibition had sent an invitation to the Council which included members generally. It stated that from April 17th to May 1st an important and representative building exhibition would be conducted at Olympia, and invited members of the building trade to pay a formal visit, the date to be decided by the Council. If the invitation was accepted, the Exhibition Committee would be pleased to send tickets of admission. The Council had instructed him to accept the invitation, and arrangements would be made in due course. As regarded the tabulated statement of wages, the matter had been looked into in response to the request of the Lancashire and Cheshire Federation, and arrangements were being made with the BUILDERS' JOURNAL to reprint from time to time, probably once in six months, a list of wages and hours of labour in the Federated towns. With regard to schedules of quantities, a resolution was brought before the Council from the Midland centre, and referred to the Administrative Committee for consideration, also one from the Lancashire and Cheshire Federation as to Government departments not issuing quantities in certain cases. A letter from the Warrington Master Builders' Association was also receiving attention, and a resolution from the Yorkshire Federation with reference to wages boards had been remitted to the Employers' Parliamentary Council with a request to take the matter up. A letter with reference to the Housing and Town Planning Bill from the Yorkshire Federation had also been referred to that Council.

In answer to a query by Mr. Easten (Newcastle) in reference to the decision of the Administrative Committee to suspend their operation in regard to local authorities and the form of contract,

The CHAIRMAN said he did not think it need tie the hands of the local Federations in any way.

Mr. EASTEN (Newcastle-on-Tyne) said he did not want the action of the Council in suspending their proposed canvass of the various public bodies for the adoption of the contract to interfere with the individual action of localities. He wanted them to go on pressing for the contract just the same as if the proposed amendment of the R.I.B.A. had not occurred.

Mr. LEVER (Liverpool) asked when something was going to be done to better prices. There had been a great outcry about this, he said, but many members were afraid to take the matter up individually. He thought the opinions of the Federation might be obtained on the matter, and embodied in a report. He did not think trade would be so bad if, instead of cut-throat competition, they were to go in for getting fair remuneration. Something ought to be done, for the position of affairs in the North was very bad.

The CHAIRMAN: The first thing to be done is to get every contractor into the Federation. It is the outside men who cut the prices.

Mr. LEVER thought the fault lay quite as much with those inside the Federation.

Mr. GREENWOOD: We are all thoroughly in sympathy with the member's object. I would suggest that he should formulate a scheme which might be submitted to the Administrative Council to see whether it is practicable or not.

Mr. SMETHURST said that a scheme was absolutely impracticable. The Lancashire and Cheshire Federation had circulated a letter pointing out the inadvisability of cutting prices, but that was the best that could be done in the matter. It was impossible to make arrangements by which men could be bound, because the whole thing was too complicated. They could only use moral persuasion.

Mr. J. W. WHITE objected to the idea going forth that it was the intention of the Federation as a body to raise prices. The matter was one which must rest with the members themselves. If people would continue to do work at less than cost price, they were bound to come to a standstill at some time.

Mr. DAVIDSON instanced an experiment in the North which had proved successful. The local authority would not recognise the masters' prices. As a result, the local Association sent a deputation to the local authority and pointed out that the authority had passed a fair wages clause. They then argued that if it were right for the protection of the operatives that this clause should be passed, it was equally fair and equitable that the local authority should recognise the employers' trade prices. He was glad to say that this argument convinced the authority, who recognised the masters' claims.

The conference then concluded.

THE STABILITY OF WALLS.

By Henry Adams, M.Inst.C.E. etc., Member of Council, The Society of Architects.

(*Concluded from p. 92, No. 730*)

Anomaly in Buttresses.

A very curious anomaly occurs in connection with these buttresses, which would not be credible except for mathematical proof. An illustration will explain. Assume a 9in. brick wall 6ft. high and consider a length of 12ft. unattached; let the brickwork weigh 1cwt. per cub. ft. and the wind blow horizontally with a force of 28lbs. per sq. ft. at right angles to the face.

Then the maximum stresses on the base will be $\frac{W}{A} \pm \frac{M}{Z} = \frac{12 \times 6 \times {\cdot}75 \times 112}{12 \times {\cdot}75} \pm \frac{12 \times 6 \times 28 \times 3}{\frac{1}{6} \times 12 \times {\cdot}75^2}$ $= 672 \pm 5376 = 6048$ lbs. per sq. ft. compression, and 4704 lbs. per sq. ft. tension. Now add a buttress 18 in. wide and projecting 4½ in. in the centre as in Fig. 13. The section modulus will be

$$Z = \frac{BD^2bd^2)^2 - 4BDbd\,(D-d)}{6\,(BD^2 - bd^2)} =$$

$$\frac{\times \quad 1{\cdot}125^2 - 10{\cdot}5 \times {\cdot}375^2)^2 - 4 \times 12 \times 1{\cdot}125 \times 10{\cdot}5 \times {\cdot}375\,(1{\cdot}125 - {\cdot}375)^2}{6\,(12 \times 1{\cdot}125^2 - 10{\cdot}5 \times {\cdot}375^2)} = \frac{68{\cdot}4}{82{\cdot}3} = 0{\cdot}83.$$

Then $\frac{W}{A} \pm \frac{M}{Z} = 672 \pm 7287$ giving 7959 lbs. per per sq. ft. compression and 6,615lbs. per sq. ft. tension, or an increase in the maximum stresses of 30 per cent. in compression and 40 per cent. in tension by adding the buttress. The loss of strength does not continue in proportion to the size of buttress added, but soon reverses, as will be seen by the curve diagram Fig. 14 (January 27th). The facts give some food for reflection as to the advisability of these piers in ordinary cases.

A Corrugated Boundary Wall.

An economical and ingenious boundary wall may be seen at Easton Park, Wickham

Market, Suffolk. It is corrugated in plan, the double bend between tangent points being 20ft. 9in., with a rise of 2ft., and although it is 9ft. 2in. high it is only 9in. thick, and has been standing safely for many years. The calculations for stability are as follows:—Draw plan Fig. 15 (Feb. 3), divide into segments, project force lines from centroid of each towards Fig. 16, mark area 1 to 5 in Fig. 17, and at right angles draw 1—0 = half 1 — 5, and draw vectors. Then parallel to the vectors across the spaces in Fig. 16 draw the inertia area *a*.

Let A = total area, then moment of inertia $I = Aa = 16 \times 0{\cdot}64 = 10{\cdot}24$ feet units, and $Z = \frac{I}{y} = \frac{10{\cdot}24}{1{\cdot}375} = 7{\cdot}44$. Ratio $\frac{W}{A} = \frac{112 \times 9\frac{1}{6}}{1} = 1026$ lbs. per sq. ft., and for a maximum stress of 3 tons per sq. ft., $\frac{W}{A} + \frac{M}{Z} = 3 \times 2240$; $\frac{W}{A} = 1026$, therefore $\frac{M}{Z} = 6720 - 1026 = 5694$, whence $M = 5694 \times 7{\cdot}44 = 42363$ lb.-ft. The leverage of the wind pressure $= \frac{9{\cdot}16}{2} = 4{\cdot}58$ ft., therefore $\frac{42363}{4{\cdot}58} = 9249$ lbs. total allowable pressure. Area of unit of wall $= 20{\cdot}75 \times 9{\cdot}16 = 190{\cdot}2$ sq. ft., giving the maximum wind pressure per sq. ft. $= \frac{9249}{190{\cdot}2} = 48{\cdot}56$ lbs. With this wind pressure the stress on the inner edge will be $\frac{W}{A} - \frac{M}{Z} = 1026 - 5694 = -4668$ lbs. or 2·085 tons per sq. ft. tension, whence it appears that the maximum safe wind pressure is 48·56 lbs. per sq. ft. for a maximum compression of 3 tons per sq. ft. and tension of 2 tons per sq. ft.

Panelled Walls.

Panelled walls, Figs. 18 and 19, may be desirable on account of appearance, but they involve extra labour, and their weight being reduced they have less stability than a solid wall. They would be calculated at the base the same as a solid wall of the reduced weight, at the top of plinth in the same way, and at base of panel the same as a wall with buttresses and counterforts.

Walls with Set-offs.

By making a series of set-offs on each side of a wall 30ft. high, at heights of 7ft. 6in., about 20 per cent. may be saved in the bulk above ground line, as shown in Figs. 20 and 21, but the extra cost of blue brick weathering at each set-off must be added, together with the increased cost of wider foundations, to obtain the same life and stability, so that no ultimate saving would result from this form of section.

If the set-offs are all on one side of the wall the wall will be more stable than above with the wind on the plain face, and less stable with wind on the set-off side, owing to the shifting of the centre of gravity.

Foundations.

The ordinary concrete foundation under a wall consists of Portland cement concrete, 1 cement, 2 sand, 5 aggregate, projecting 6in. on each side of bottom course of footings and 9in. thick. The 6in. projection arises from the allowance given in the excavation for the bricklayer to get at his work and the thickness is settled upon no rule whatever. It is desirable that some general rule should be adopted and the author suggests the method shown in Fig. 22. Approximately it may be taken as

Projection of concrete = ½ thickness of wall.
Depth concrete = thickness of wall.

House Walls.

Roundelet, a century ago, undertook a scientific investigation into the proper strength of house walls, and he based his calculations largely upon an examination of ancient Roman walls which had withstood the storms of eight or ten centuries. Among these, the walls of Hadrian's palace at Tivoli had a thickness of one-sixteenth their height, and that, Prof. Unwin states, is not widely different from the thickness which would now be required in strong and lofty buildings. Gwilt gives a formula for the thickness of brick walls as follows:—

$$T = \frac{HL}{ND} \quad\ldots\ldots\ldots\ldots\ldots\ldots(23)$$

where T = thickness in ft., H = height in ft., L = length between party or cross walls in ft., D = diagonal of length of wall by scaling or $\sqrt{H^2 + L^2}$, N = constant = 22 for dwelling houses, 20 for warehouses, 18 for public buildings, increased to 27, 23 and 20 respectively when H is less than ½L. Rubble stone walls to be ⅓ thicker than those of brick.

His rules for modern use can be put into a formula as follows:

$$t = \frac{Lc}{\sqrt{L^2 + H^2}} \quad\ldots\ldots\ldots\ldots\ldots\ldots(24)$$

where t = thickness of wall in ft., H = height in ft., L = length of wall in ft., c = constant = $\frac{H}{12}$ for warehouses, and $\frac{H}{20}$ for dwelling houses. Graphically it may be worked as shown in Fig. 23.

According to Mitchell's "Brickwork and Masonry" (2nd edition, p. 195) it has been stated by an "eminent authority" that he should consider a wall overhanging 1 in 24 not unsafe, and dangerous when it overhangs 1 in 12; but, from the principles which have been placed before you this evening, it is clear that any statement of this kind is irrational, unless made in connection with a wall of a given height and thickness, as the stability will be affected by both these dimensions when the rate of overhang is constant.

The author trusts that, while he has given the material for a full consideration of the subject, he has reduced the matter to the utmost simplicity for practical use, by suggesting that plain fence walls should have a minimum thickness of one-ninth of their height.

Trade and Craft.

The Carron Company.

Founded in 1759, Carron Company, iron founders, coal masters, engineers, ship owners, etc., of Carron, Stirlingshire, has now reached the 150th anniversary of its foundation with an unbroken and continued business career throughout that long period of time. Practically the pioneers of the iron industry in Scotland, Carron Company has well earned and deservedly holds a world-wide reputation for the excellence of its manufactures of every description of cast iron goods, such as ranges, grates, stoves, cooking apparatus, baths, and lavatories, railings, stable fittings, gas appliances, etc., suitable alike for the mansion or cottage homes of this country, or the camps and bungalows of other climes. Many awards have been made to Carron Company during the past sixty years, and at the Franco-British Exhibition in 1908, a Grand Prix was awarded the Company for excellence in design and workmanship—a proof that after a century and a half of existence the manufactures of this old Corporation still maintain their high level of excellence.

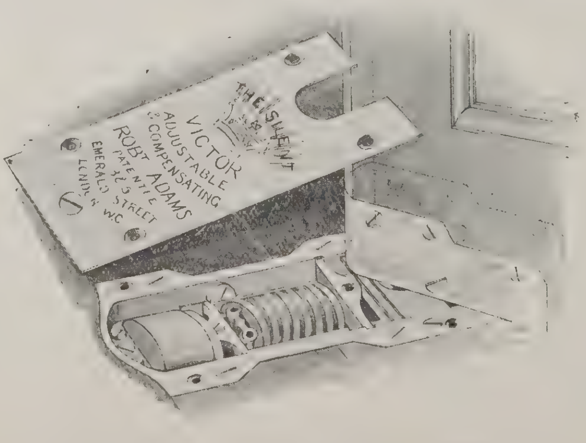
Indented Bars.

These bars are just now being used in connection with the building of Sessions Register House, at Edinburgh. Indented steel bars are also being used on an extensive scale as reinforcing material in connection with works under supervision of the Resident Engineer, Glasgow Main Drainage Works. They are also being used exclusively as reinforcement for the new sea defence works which are being carried out by Mr. W. E. Blake, contractor, of Plymouth, for the Teignmouth Urban District Council. The address of the Indented Steel Bar Co., Ltd., is Queen Anne's Chambers, Westminster.

A curious statement has been made with respect to the roof of Chesterfield Church. It is estimated by some that this part of the roof has remained untouched for a matter of six hundred years. The men engaged in stripping the ceiling are inclined to endorse this extraordinary statement. At any rate, it is certainly very old-fashioned workmanship. The whole of the roof is composed of oak beams supporting leads. The spars to which the plaster-work is attached are also of oak, but are very wide apart as compared with the present-day method of sparring. Laths there are none, their place being supplied with particularly thick, strong rushes, which crinkle and crack with dry old age as the men tear it down. The roof itself is quite sound and safe, but here and there are holes through which the sky may be seen, and through which rain has apparently often percolated. It is not proposed to supersede the ceiling with plaster work, but to underdraw with oak boards.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.

PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE,
with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.

60 HIGHEST AWARDS.

The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing.

— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

THE NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS OF GREAT BRITAIN AND IRELAND.

OFFICERS, ETC., 1909.

President:
ERNEST J. BROWN (LONDON).

Senior Vice-President:
COUNCILLOR S. SMETHURST, J.P. (OLDHAM)

Junior Vice-President:
J. W. WHITE (SUNDERLAND).

Hon. Vice-Presidents:
ROBERT NEILL, J.P. (MANCHESTER).
J. HOWARD COLLS (LONDON).
COUNTY ALDERMAN J. BOWEN, J.P. (BIRMINGHAM).
T. F. RIDER, F.R.G.S. (LONDON).
J. STEVENSON JONES (LIVERPOOL).
ALDERMAN W. HOLDSWORTH, J.P. (BRADFORD)
A. KRAUSS (BRISTOL).
B. I. GREENWOOD (LONDON).
C. W. GREEN (LIVERPOOL).
ALDERMAN W. H. JESSOP, J.P. (HUDDERSFIELD).
WM. SHEPHERD (LONDON).
GEO. MACFARLANE (MANCHESTER).
WM. NICHOLSON (LEEDS).
C. H. BARNSLEY (BIRMINGHAM).

Hon. Treasurer:
JAMES WRIGHT (NOTTINGHAM).

Hon. Auditors:
F. HIGGS (LONDON) AND W. THOMAS (CARDIFF).

Representatives on the Employers' Parliamentary Council:
ERNEST J. BROWN (LONDON).
WM. SHEPHERD (LONDON).

ADMINISTRATIVE COMMITTEE.

President:—ERNEST J. BROWN (LONDON).
Senior Vice-President:—S. SMETHURST, J.P. (OLDHAM).
Junior Vice-President:—J. W. WHITE (SUNDERLAND).
Hon. Treasurer:—JAS. WRIGHT (NOTTINGHAM).
Senior Hon. Auditor:—F. HIGGS (LONDON).
Junior Hon. Auditor:—W. THOMAS (CARDIFF).

NOTE.—The above-named are Members *ex officio*.

ELECTED MEMBERS.

Northern Centre—T. WILKINSON (Middlesbrough). W. R. THOMPSON (Dewsbury). GEORGE MACFARLANE (Manchester). JAS. STORRS, J.P. (Stalybridge).

Midland Centre—H. WILLCOCK (Wolverhampton). ALBERT S. SMITH, (Birmingham).

South-Eastern Centre—WM. SHEPHERD (London). W. F. WALLIS (Maidstone). B. I. GREENWOOD (London). J. BELL, J.P. (Cambridge).

South Western-Centre—Coun. W. N. BLACKBURN (Newport, Mon.). E. J. NEALE (Bristol).

Secretary:
A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

MONTHLY OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

The annual general meeting of the National Federation was held on January 27th in the Balmoral Room of the Trocadero Restaurant, Piccadilly. A full report of the proceedings has been prepared, and the first instalment of it appears on p. 121 of the present issue. The thirty-first annual report, which is too long for insertion here, deals with the state of trade, which still shows no improvement, and with other matters mentioned below. As to the working of the Conciliation Boards, the following remarks are made:—Conciliation Boards: The National Board has held three meetings during the past half-year. The cases considered were:— Appeal of Carpenters and Joiners and Bricklayers of Southampton: No decision on the question at issue, viz., an advance of wages, was given by the Board, but the parties were recommended to arbitration. Appeal of Carpenters and Joiners of Rochdale: No decision was given on the main issue, viz., an advance of wages, but a decision was given as to the notice rule. Appeal of the Carpenters and Joiners of Manchester for an advance of wages was re-heard and decided in favour of the employers. Appeal of the Employers at Leicester as to correct Interpretation of Rule as to area of the Leicester District: Decision given in favour of the workmen. Working of the Conciliation Scheme: The Northern Counties Federation report that the experience of the working of the conciliation scheme in their district has been satisfactory. The Tyne and Blyth District Board, since the inauguration, has been used by the operatives for a settlement of a variety of disputes, including some which would otherwise have been settled in the county court. Thirteen meetings have been held since its inauguration. In Sunderland the Conciliation Board has worked smoothly, though there is a strong desire on the part of the operatives to extend the area of the Board's jurisdiction beyond that of the employers' association. Three meetings have been held. The Teesside's experience has also been satisfactory. In addition to the annual meeting only one case has been brought forward. The Middlesbrough bricklayers asked for an interpretation of the Walking Time Rule. Two meetings were held, the decision being in favour of the employers. The Northern Centre report having held six meetings, given eight decisions, and once failed to decide. The Midland Centre having held four meetings, given two decisions, and twice failed to decide. Birmingham District Board also settled two disputes. The S.E. Centre report two meetings, one decision and one failure to decide. Proposals for amending the conciliation rules and for affording facilities for builders' labourers to participate to some extent, are also mentioned. The reserve fund is making satisfactory progress. As the result of certain statistical returns, it is stated that: "It is quite evident that an insufficient number of apprentices are being made to meet the future requirements of the various trades, especially in regard to masons, bricklayers, slaters, and tilers, plasterers and painters. Complaint is made as to the inquisitional character of the information demanded under the Census of Production Act, and a simplification of the forms is desired. A model clause for use as a fair wages clause in contracts is under consideration. A special committee has reported on the working of the agreement with the National Association of Operative Plasterers, and the result of their labours is given in the report of the proceedings at the annual meeting. Reference is made to the active steps which have been and are being taken to bring the Official Journal to the notice of the membership. Among the other subjects dealt with are:—Matters connected with the Coal Mines (8 hours') Bill; the International Congress of Builders at Paris; the Agreed Form of Contract; Compulsory State Insurance; the protection of a member at York whom it is sought to hold responsible for defects in materials supplied from a specified manufacturer; the Court of Arbitration, and the constitution of its panels; return under the Workmen's Compensation Act; Municipal Works Department at Leeds, and the progress of organisation. Particulars of demands made and concessions granted in various cities and towns during the past half-year are also given. The accounts show the financial position of the Federation to be in every way sound.

THE NORTHERN CENTRE OF THE NATIONAL FEDERATION

COMPOSED OF

The Lancashire, Cheshire and North Wales Federation, The Yorkshire Federation and The Northern Counties Federation.

Secretary: JAMES DENVER, Cromwell Buildings, Blackfriars Street, Manchester.

The annual general meeting of the Northern Centre Executive Council was held at the Salisbury Hotel, off Fleet Street, London, on Monday afternoon, January 25th, at 5.30, when Mr. Henry Matthews, J.P., Manchester, presided over the commencement of the proceedings, and there was a good attendance.

The minutes of the last quarterly and of the special meetings were read and confirmed, and the accounts for the half-year ending December 31st, 1908, were passed for payment.

On the motion of the chairman (Mr. H. Matthews), seconded by Mr. T. Wilkinson, Councillor Stephen Easten, Newcastle-on-Tyne, was elected president of the centre for the ensuing year. Councillor Easten then took the chair, and returned thanks to the meeting for electing him to that position.

A vote of thanks was passed to the retiring President for his services during the past year, which Mr. Matthews suitably acknowledged.

Mr. A. J. Forsdike, Sheffield, was elected senior vice-president, on the motion of Mr. H. Matthews, seconded by Mr. W. R. Thompson; and on the motion of Councillor S. Smethurst, seconded by Mr. H. Matthews, Mr. George Macfarlane, Manchester, was elected junior vice-president. Mr. John Proud, West Hartlepool, was elected hon. auditor.

A letter was read from the Liverpool Association with reference to a resolution passed at the last meeting of this Centre. A long discussion ensued, and the secretary was instructed as to the reply to the letter.

The Secretary reported that several federations and associations had agreed to the suggested alterations for which this centre had given notice in the Conciliation Board rules.

The question of the allocation of the Centre subscription to the National Federation was considered, and ultimately it was agreed that the same be paid on the same basis as last year.

Some discussion took place with reference to the National Reserve Fund, but no formal resolution was passed.

The Yorkshire representatives stated that they had approached the National Federation for support in a case of one of their members with respect to liability for work he had completed some time ago, and asked this Centre to support them when the matter was considered in the National Council the following day. After hearing the full facts of the case, it was considered that the question was one of general interest to the trade, and it was agreed to support the Yorkshire Federation in the matter.

It was agreed that the Centre become subscribers to the "Builders' Journal."

Mr. J. B. Johnson raised the question of the N.A.O.P. agreement, and gave his report as the Centre representative on the Committee appointed to consider the matter.—JAMES DENVER.

THE LANCASHIRE, CHESHIRE AND NORTH WALES FEDERATION.

Secretary: JOHN TOMLISON, Cromwell Buildings, Blackfriars Street, Manchester.

The monthly meeting of the Administrative Committee of the Lancashire, Cheshire, and North Wales Federation was held at the Board room, Manchester, on Friday, January 8th, when the president (Mr. William Bullen) occupied the chair, and there were nine members present.

The minutes of the last meeting having been read and confirmed, the Finance subcommittee presented a report as to the future issue of the Federation Year Book, suggesting that the half-yearly reports be issued in future in book form, together with the additional information as at present contained in the Year Book. The Secretary reported that tenders had been invited for the printing, but all were not yet to hand. After giving the matter full consideration, the sub-committee were empowered to carry out the scheme accordingly.

Correspondence was read and considered on the subject of the publication of a tabulated statement of wages paid in the building trades in the federated towns, and a resolution was passed requesting that the National Federation should consider the advisability of again publishing the information.

Other matters of trade interest were considered, but no formal resolutions were passed.—JOHN TOMLISON.

A conference of secretaries of the local associations connected with the Lancashire, Cheshire, and North Wales Federation, was held at the Board room, Blackfriars Street, Manchester, on Friday, January 22nd, when the president, Mr. William Bullen, presided over a well-attended meeting.

The Chairman, in opening the meeting, explained that it was not intended at this the first meeting to have any definite programme, but every member present was invited to raise questions of general interest which they desired to discuss, or upon which they wished for information.

Mr. E. Dean, of Oldham, called attention to the model rules issued by the National Federation, and contained in the report of the Conference of Secretaries held in London in October last, and raised two or three points in connection therewith. A general discussion ensued, and ultimately Mr. Dean moved, and Mr. B. B. Moss seconded, a resolution thanking the National Council for the model set of local association rules submitted.

A general discussion took place on points of business interest, amongst which were the working of the inter-trading rule, tendering without quantities, the admission of co-operative societies as members of local associations, collective insurance, and the position of secretaries generally.

The position of the Burnley master joiners, who have formed a separate association, was also discussed, and Mr. Astwood, the local secretary, was advised to try to arrange a general meeting, so that the president and members of the organising committee can attend to explain the rules and endeavour to reunite the employers in one general association.

On the motion of Mr. B. B. Moss, seconded by Mr. R. Hall, it was decided to ask the Administrative Committee to arrange for half-yearly conferences in future.

After some discussion, the Chairman thanked the secretaries present for attending, and the representatives proceeded to the Victoria Hotel, where tea had been provided. A vote of thanks to the Federation for arranging the conference, proposed by Mr. Moss and seconded by Mr. Dean, brought the proceedings to a close.

ROBERT HALL,

Building Surveyor,

52, Frederick Street, BURY

With over 35 years practical experience of the Building Trade, and during the last 15 years a very varied experience in measuring up and adjusting contract and other accounts, is prepared to undertake and submit quotations for the following :—

The Measuring-up and Adjustment of Accounts,
Collection and Settlement of Accounts,
Assistance given in Estimating,
Annual or other Periodical Stocktakings,
Private Enquiries and Arbitrations undertaken,
or any other special work incidental to that a Builder or Contractor.

52, Frederick St., BURY.

NOW READY. 760 PAGES. PRICE 4/-

LAXTON'S

BUILDERS' PRICE BOOK

FOR 1909. (92nd EDITION.)

"The acknowledged standard work of reference."

CONTAINING ABOUT 73,000 PRICES

MEMORANDA AND METHODS OF MEASUREMENT IN THE SEVERAL TRADES.

Prices and Descriptions of New Materials and Inventions in all the various Trades suited to the Builder, Contractor, and Engineer.

The whole carefully corrected and revised according to the current prices of material and labour.

The work also contains—

THE LONDON BUILDING ACT.
BYE-LAWS OF THE LONDON COUNTY COUNCIL.
A CATALOGUE OF THE DISTINGUISHING BRANDS ON DEALS, BATTENS AND FLOORING BOARDS.
NOTES OF CASES AND DECISIONS IN THE SUPERIOR COURTS.

together with much other useful and important information

Printed and Published by

KELLYS' DIRECTORIES, Ltd.,
182-3-4, HIGH HOLBORN, LONDON, W.C.

And Sold by

SIMPKIN, MARSHALL & CO.,
STATIONERS' HALL COURT.

And may be ordered of any Bookseller.

D. LORDEN,

Plasterer,

Plaster and Cement Merchant.
Worker in Fibrous Plaster &c,
Tom Brown Street, RUGBY.

JUST PUBLISHED. Price 3s. 6d. net.

Rates, Taxes,

AND

Other Outgoings,

TO WHICH

Real Property is Subject.

BY

G. S. MITCHELL, F.S.I.

Author of "Handbook of Land Drainage"; "Notes on the Valuation of Agricultural Tenantright"; "Practical Stock Ensilage"; &c., &c.

EFFINGHAM WILSON, 54, THREADNEEDLE STREET, E.C.

"The Architectural Review."

A Magazine of Architecture and Arts of Design. Edited by MERVYN E. MACARTNEY, B.A., F.R.I.B.A., F.S.A.

Price **1/-** Monthly. Annual Subscription **16/-** post free.

ACCRINGTON AND DISTRICT.

Secretary pro. tem.: R. Hall.

The first general meeting of the newly-formed Accrington and District Building Trade Employers' Association was held at the Railway Hotel, Accrington, on Tuesday evening, January 19th, forty employers in the various branches of the trade being represented. The committee, which was appointed at a meeting held in December, 1908, presented a code of rules and other information in accordance with instructions. Mr. James Waddington, who had acted as chairman of the committee, was appointed chairman *pro tem.* until the rules had been adopted by the meeting. These were taken seriatim, and, with very slight alterations, unanimously adopted. Everything being then in order for the election of officers and committee, the following were appointed:—President, Mr. James Waddington; senior vice-president, Mr. Arthur Berry; junior vice-president, Mr. Foden; senior treasurer, Mr. H. Ramsbottom; auditors, Messrs. W. Walmsley and W. Ramsbottom; and a committee representative of the trades as follows:—Stonemasons, Mr. Richard Stewart; carpenters and joiners, Mr. Richard Nuttall; plumbers, Mr. James Carter; slaters, Mr. W. Walmsley; painters and decorators, Mr. J. R. Carter; plasterers, Mr. G. Eastwood. Mr. Robert Hall, organising secretary to the Federation, was appointed secretary *pro tem.* until the next general meeting in April. The question of the subscription, and application for admittance to the Lancashire and Cheshire Federation, was left with the committee to report upon. On the motion of Mr. H. Ramsbottom, seconded by Mr. Councillor Dixon, a unanimous vote of thanks was passed to Mr. Waddington for his services as chairman, and to the committee who had drafted the rules.

Clitheroe and District.

A meeting of employers in the building trade was held at the Starkey Arms Hotel, Clitheroe, on Wednesday evening, January 13th. The meeting was in answer to a circular sent out by Mr. Robert Hall, organising secretary to the Lancashire, Cheshire and North Wales Federation, who attended the meeting and addressed the members present on the importance of organisation. After a full explanation of the benefits to be derived from federation, and a very open expression of opinion from those present upon the desirability of such an association being established in Clitheroe, it was agreed that, as several employers of labour in the district had not signified their intention, either orally or by circular, to become members if an association was formed, the matter be left in the hands of the organising secretary, after paying a visit to the several members mentioned, to arrange for another meeting, when a committee to draw up the rules, etc., might be appointed.

Colne and District.

A meeting of employers of Colne and district was held at the Crown Hotel, Colne, on Monday evening, January 18th, fifteen employers connected with the building trade being in attendance. Several years ago there existed in Colne a very strong employers' association, but it had been allowed to lapse. It was unanimously agreed that Mr. James Laycock, who formerly acted as secretary to the old association, should join the organising secretary in a campaign of visitation to those employers in Colne who were not present, and arrange for another meeting at as early a date as possible, when a committee could be appointed to draw up the rules.

BARROW-IN-FURNESS ASSOCIATION.

Secretary: J. Baker.

The monthly meeting of the Barrow-in-Furness Association was held on Tuesday, January 26th, when the election of officers for the ensuing year took place, and resulted as follows:—President, Mr. G. Varley; vice-president, Mr. E. Banks; secretary, Mr. J. Baker; all re-elected. Mr. E. Ward was elected treasurer, in place of Mr. J. Walker, resigned.

The balance sheet was submitted and adopted.

The question of tendering for work without quantities was under consideration, and it was ultimately resolved to adjourn the matter to the next meeting.

The Secretary gave a résumé of the principal matters under consideration at the meeting of secretaries at Manchester, at which he attended, and it was thought that some of the matters referred to might with benefit to the association be considered further at a subsequent meeting.

The Secretary reported the receipt of copies of "Municipal Works Departments," as published by the Yorkshire Federation, for distribution amongst the members of the County Council.

After the business had been disposed of the remainder of the evening was spent in the enjoyment of an informal concert.

BURY AND DISTRICT ASSOCIATION.

Secretary: R. Hall.

A special general meeting of the Bury and District Association was held at the Boar's Head Hotel, Fleet Street, Bury, on Wednesday morning, January 13th, to receive a report from the honorary solicitor to the association (Mr. H. W. Chell), and the secretary respecting building clauses in the corporation's proposed new Parliamentary Bill. Mr. Chell explained that several of the clauses in the proposed Bill would very materially affect the builders and the building trade if allowed to go through as drafted. Several suggested alterations were proposed, and a small committee, consisting of the president (Mr. John Inman), Mr. James Ramsden, Mr. H. Thompson, and Mr. John Hutchinson, was appointed to confer with Mr. Chell after he had consulted with the town clerk on the proposed amendments of the several clauses, so that the association could be represented and their opinions expressed at the public meeting to be held that evening. Mr. Chell, during the afternoon, consulted the town clerk, and met the appointed committee in the evening, and then proceeded to the public meeting to state their case. Mr. Chell represented to the town clerk that in Part II. of the Bill, in dealing with the gas, there was an introduction of words which were not in the 1885 Act. They had inserted the words that they have power not only to sell, let for hire, and deal with those articles, but to fix, repair, and remove them in houses and buildings, and for that purpose to provide material and make a charge. He appeared for the master builders of the town, and it appeared to them it was taking a wide power, and a power which did not exist in the 1885 Act. Probably it might be convenient at that stage to ask the town clerk if he would say how those words came to be inserted in the section, not being in the 1885 Act. The town clerk said that the words were found in a Model Bill—Parliament's Model Bill—and that was why they were inserted there. If they had not been inserted there they would have been inserted when the Bill came to be reported upon. It was a stock clause, modelled from what was previously in private Bills, and what the Corporation had been carrying out since 1872.

Mr. Chell said it looked as though the plumbing trade was going to suffer if the fixing and repair of those things was to be begun.

The Town Clerk said it applied more to gas meters. He did not think the committee had in its mind anything beyond what it had been doing for some time. The same remarks would apply to the electricity section.

Mr. Chell said that when they came to the building clauses there was section 135, sub-section I., which stated that a person should not erect two or more houses in a row unless the front or forecourts of the houses abutted on a street already made or formed. It seemed to them that that might press very hardly on a builder who was wanting to put up any property in an undeveloped part. If he could not begin to build two or more houses until the street had been made or formed, it might seriously delay him and interfere with his business arrangements. If sub-section II. were passed no single house could be commenced or excavating done until the street was laid out and formed, and the level shown on a plan approved by the corporation. Their comment was that it was a needless restriction, and might press on builders if they had to wait for the street to be made before they could excavate their land. A builder might be removing soil from his plot, and the corporation might be carting soil on the street, whereas it would be quite easy for the builder to put his soil on the place needed for the street. It was quite conceivable that a builder might want to take advantage of a good part of the year to commence his building operations, and he might be prejudiced by that. The principle should be that where plans had already been approved and levels determined, a man might begin. They wanted to work with the corporation, and they recognised that the corporation wanted to work with them. That was the road to mutual success. All they asked was that when the levels of the streets had been fixed, and the plans approved, that they should be enabled to commence building operations. He took it from the town clerk that there would be no serious objection raised to it. It was not a question of principle, but of drafting. As regarded clause 136—"No building, not being a public building, shall be erected fronting to any street of a greater height, from the level of such street, than the width of such street"—they asked that it should be made to read that no building should be erected fronting to any main street of a greater height than the width of the street; but that that clause should not apply to a cross or back street. They might easily point to a building which fronted a street and had a front to a side street, and if the Bill were passed there would be the anomaly that it would satisfy the section on one side and swear at the section on the other side. They asked that the clause should be amended, and he understood from the town clerk there would be no serious objection made. Section 153 was very drastic if it stood in its present form. The corporation might make by-laws with respect to materials with which new buildings should be erected, and the materials with which grates, stoves, and fireplaces should be set, the construction of ovens, furnaces, etc. On that he thought there were three points. First, the provision as to grates, stoves, and fireplaces was covered by section 137 or 149—(The town clerk: 137 and 149)—and the master builders would suggest that the latter part of it be strengthened so as to vest in the corporation the power to prescribe the thickness and construction of all walls. They ought to take the responsibility of saying what the thickness and construction of all the walls should be. But it was rather drastic to give the corporation the power to make by-laws with respect to the materials with which new buildings should be constructed. That was a power which, if vested in the hands of the corporation, might be made or not adversely to the builders' interests; the corporation might prescribe not only the kind of brick, but quality of brick, or whether stone, or say what cement they were to use. He would like to say, on behalf of his clients, that they had gone through the Bill with the greatest possible desire to recognise the wishes of the corporation to equip themselves with all necessary powers to put the town, where deficient, into the best condition possible. So far as his clients were concerned they wished to co-operate with the corporation; but as business men they did not want their hands tied to such an extent. He thanked the town clerk for the courtesy with which he met them that afternoon.

The town clerk replied that, as Mr. Chell had said, he saw no serious objection to meeting the views he had so ably expressed. As he knew, he (the town clerk) had had certain marks against some of the clauses for further consideration and re-drafting, and he thought he would be able to advise the Parliamentary Committee to concede the greater part of what Mr. Chell had asked, if not the whole. He did not think there ought to be any serious difficulty in coming to an agreement.

The second annual whist drive and dance, held in the Town Hall, Bury, on January 29th, was attended by about ninety ladies and gentlemen, and was highly successful.

LLANDUDNO AND DISTRICT ASSOCIATION.

Secretary: E. P. Morris, Accountant.

The monthly meeting of the Committee of the Llandudno Association was held on Thursday, January 28th, when, in the absence of the president, the chair was taken by Mr. Henry Hughes.

The question of universal starting time was considered, and a sub-committee, consisting of the president (J. A. Thomas), Evan Hughes, Luther Roberts, and R. T. Owen, was appointed to go into the matter and report to a further meeting.

A circular from the National Federation, dealing with the shortage of apprentices, was considered, and it was decided to recommend to members the desirability of increasing the number of apprentices, and also to have all apprentices bound.

The Secretary was asked to obtain the scale of wages to boys, and also to write to various wholesale firms inviting them to become members.

MANCHESTER, SALFORD AND DISTRICT ASSOCIATION.

Secretary: John Tomlison.

The number of members to date of the Manchester, Salford, and District Association is 183.

The master plasterers and painters' branch of the association held their monthly meeting on January 12th, when Mr. James Higson presided over a good attendance of members. Applications for membership from two employers connected with this branch trade were approved, and recommended to the general committee for election.

The question of the fixing and finishing of patent plaster partitions was considered at some length, and it was decided that the committee should meet representatives of the manufacturers with a view to some arrangement being made.

Several fines were imposed on members of the branch for failing to attend a reasonable number of meetings in accordance with the rule.

Several other matters connected with the trade were considered, and resolutions passed.

The stonemasons' branch met a deputation from the operatives at the board-room, Blackfriars Street, on January 13th, to consider matters arising under the notice given by the employers for a reduction in wages and several alterations to the working rules. After some discussion, the employers agreed to the discharge notice being inserted in their notice as contained in the present rules. It was also agreed that, in the case of a dispute which is referred to the joint committee, four representatives on either side shall form a quorum.

The monthly meeting of the general committee of the association was held on Thursday, January 14th, when the president, Mr. George Macfarlane, presided over a good attendance.

Accounts for the quarter were passed for payment, and three new members were elected into the association. The question of the reorganisation of the association was again down for consideration, and several reports were received. It was decided that the revised list of those members who had qualified under the new rules be issued without further delay, and that members be instructed to conform to the inter-trading rule.

Circulars were read from the National Federation with reference to the "Builders' Journal," and the secretary gave his report thereon, and it was agreed that everything possible was being done to further the scheme as far as this association was concerned. It was agreed that the association become subscribers to the journal, and the secretary was instructed to make application for the same.

Fines imposed by the plasterers' and painters' branch under their rules were confirmed.

A letter was read from the secretary of the National Federation with reference to the Manchester Corporation Bill to be laid before Parliament during the next session, and the secretary was instructed to obtain copies of the clauses relating to building operations for consideration at the next meeting.

The joiners' branch met at the board-room, Blackfriars Street, on Thursday, January 14th, to receive a deputation from the operatives' society to settle matters arising out of the decisions of the National and Northern Centre Conciliation Boards. The working hours for night shifts provided under the Northern Centre decision were adopted. The operatives requested that the word "federated" be deleted from the said rule, but it was pointed out that as the decision was based on the word, they could not see their way to consent to its being deleted. It was agreed to add a clause to the discharge rule, providing that 1s. shall be allowed over and above their wages for grinding, when such facilities were not provided, but that it be distinctly understood that the full notice shall be worked by the employee.

It was decided to call an early meeting to consider the present notice and counter notice with a view to arriving at some mutual arrangement, whereby the matter can be settled and the rules printed at an early date.

OLDHAM AND DISTRICT ASSOCIATION.

Secretaries: Cowper and Dean, Accountants.

The number of members of the Oldham and District Association is now 180.

Since the last published report, the operative joiners' society have asked for a meeting in connection with the employers' notice for reduction in wages of ½d. per hour. This meeting will be granted shortly. The executive committee have also met and approved of the accounts for the year for submission to the general meeting. It was resolved that a number of members who were in arrears with their subscriptions be given seven days' notice of expulsion from membership.

It was recommended to the annual general meeting that the entrance fee for new members be increased from 2s. 6d. to £2 2s. It was felt that this was necessary because, in the first place, the surplus funds were now in a healthy condition, being equal to about 50s. per member, and it was deemed unfair that new members should participate in these funds on an equal footing with old members; secondly, a number of members who had joined during the last two or three years seemed to have an idea that they could enter and leave the association when it suited their convenience under the intertrading rule. It was thought that an entrance fee of £2 2s. would act as a deterrent against this objectionable proceeding.

The question of the liability of contractors for defects in material, etc., specified by architects or proprietors, was brought forward by the president, and he pointed out that it had been ascertained that the state of the law was such that unless some formal communication was sent by the contractor to the architect or proprietor, in the first place, drawing attention to the defects likely to arise, the contractor could he held to have acquiesced in the suitability of the same, and would be held liable accordingly.

The twentieth annual general meeting was held at the Café Monico, Oldham, on Friday evening, January 29th. About forty members were present. The minutes of the last half-yearly general meeting were duly approved, and the president (Councillor Samuel Smethurst, J.P.), dealt with the annual report, which was duly approved. He pointed out the fact that the association would attain its majority next year, and this would in the ordinary course of events coincide with his election to the presidential chair of the National Federation. He said that some consideration would have to be given to the question of how the Official Journal could be placed in the hands of each member by increasing subscriptions or otherwise.

The question of the utility of the conciliation boards was raised by Mr. Rose, and discussed, and it was generally felt that they had been of considerable advantage in connection with trade disputes during 1908.

The poor response for subscriptions of 1s. towards the cost of the L.C. and N.W. Federation Year Book was discussed, and it was resolved that the amount be made up into £4 out of the local funds, as a fair proportion of the cost from Oldham. This was in addition to the amount paid for insertion of local operatives' rules and association rules in the Year Book. The local contributions to the Federation reserve funds were also discussed, and it was pointed out that at the commencement £300 minimum had been promised from Oldham, and £15 still was required to complete this amount, in addition to £6 16s. 6d. promised, but still outstanding. The list of subscribers was read, and resulted in further promises of £3 3s. The cash account and balance sheet were then submitted to the meeting and discussed.

The surplus funds have been considerably increased during the year, and the income is well above the expenditure, and appeared likely to continue so in future, although very considerable difficulty had been experienced by the secretaries in collecting subscriptions during the year, on account of bad trade, etc. The accounts were approved.

The officers and committeemen were elected for ensuing year; the only changes being as follows:—Councillor James Ogden, J.P., was elected vice-president; Mr. Edward Stephenson, jun., was elected to the executive committee in place of Mr. Ogden, who was now an ex-officio member; and Mr. W. Rose was elected to the executive committee in place of Mr. E. Whittaker, and also on the local trade committee.

It was decided that the Executive Committee should arrange the details for a picnic to Nottingham in June or July.

Mr. Councillor Ogden spoke at length on the cost of insurance against legal liability for accidents to workpeople, and the serious liability which had been placed upon builders by the Workmen's Compensation Act, 1906, not only in connection with direct workpeople, but in connection with sub-contractors' men. The expenses of the builder in this and other matters were increasing, and it behoved all members connected with the master builders' federations to endeavour to obtain better prices for the work undertaken, and not to accept contracts at prices which could not possibly be remunerative, as was the position in many instances at present. The president said that the difficulty lay in formulating a satisfactory and reasonably complete scheme, whereby better prices could be attained. At present it rested with each individual member to be determined to tender only under profitable conditions, and endeavour to be more loyal to each other in this connection.

ROSSENDALE AND DISTRICT ASSOCIATION.

Secreary: Robert Hall.

The fourth annual dinner in connection with the Rossendale and District Association was held at the Queen's Arms Hotel, Rawtenstall, on Wednesday evening, January 20th, forty representatives sitting down. In addition to the members of the association were Mr. George Macfarlane, of Manchester, past president of the National Federation of Building Trade Employers of Great Britain and Ireland, as well as representing the Lancashire and Cheshire Federation, who, in reply to the toast of the Federation, spoke on the necessity of combination, and hoped that the reports one heard that things were mending were true, and that not only would the amount of work increase and improve, but that it would bring better prices. Mr. J. E. Tinline, past president of the Bury and District Building Trade Employers' Association, proposed the toast of the Rossendale and District Master Builders' Association, coupling with it the name of the president, Mr. B. Constantine, of Haslingden. Mr. Tinline said he honestly believed that if members would only carry out the intertrading rule in the spirit in which it was intended to apply, they would, in a few years, gather into the association every employer in the building trade in the Rossendale Valley. Mr. Constantine, the president, responding, said that although the association had up to the present only partially adopted the intertrading rule, he felt that to be successful they would have to adopt the rule in its entirety. Other toasts followed, including that of the visitors, which was responded to by the surveyors of Bacup, Rawtenstall, and Haslingden.

ST. HELENS ASSOCIATION.

Secretary: Bertram B. Moss, F.C.R.A.

The St. Helens Association has had no meetings for a considerable time, as great dissatisfaction has been expressed by several members with the decision of the Northern Centre Conciliation Board increasing the joiners' wages, and a large number of resignations have come in from various members. Through the influence of the president of the Lancashire and Cheshire Federation, Mr. William Bullen, the employers in the town have been invited to a meeting, and several up to now have promised to attend the meeting when called, and it is hoped that several favourable replies will be received from others shortly.

WARRINGTON AND DISTRICT ASSOCIATION.

Secretary: Bertram B. Moss, F.C.R.A.

The annual general meeting of the Warrington and District Association was held at 57, Horsemarket Street, Warrington, on January 20th, when a large number of members attended. All the officers and committee were re-elected as follows:—President, Mr. Henry Collin; vice-president, Mr. C. W. Davenport; secretary, Mr. Bertram B. Moss, F.C.R.A., 24, Sir Thomas Street, Liverpool; committee, Mr. Henry Collin, Mr. C. W. Davenport, Mr. H. Fairclough, Mr. F. Warburton, Mr. F. Wright, Mr. John Dolan, and Mr. J. B. Johnson.

The annual report, which was unanimously adopted, summarises the work of the year, and records that no serious disputes with the operatives have occurred, nor has there been any alteration of wages or working hours.

It is stated that when the question of giving notice to the operatives for a reduction in wages was under discussion, the recent decisions of the conciliation boards were considered, and in view of the unsatisfactory procedure of these conciliation boards, it was decided that this association should give the Federation six months' notice to withdraw, and this notice expires on May 1st next. It is necessary to resign from the Federation to avoid coming under the jurisdiction of the conciliation boards, as it is held that no individual association can withdraw from the conciliation board whilst affiliated to the Federation, and this course has been adopted in order that this association will have a free hand when the notice for alteration of rules expires in May and June next.

Communications have been addressed to architects, and others, with reference to the conditions of contracts, etc., and with reference to estimates being invited without quantities being supplied, also in cases where priced quantities have been demanded with each tender. The representations made in these cases have in several instances resulted in the elimination of unfair conditions.

An appeal to members for subscriptions to Warrington Infirmary extension fund resulted in £30 14s. 6d. being subscribed by eight firms, and this amount was remitted to the treasurer of the fund. In addition to this, four other members had already subscribed over £120 direct to the fund.

WIGAN AND DISTRICT ASSOCIATION.

Secretary: R. Hollows, A.C.A., etc.

The first meeting of representatives of Wigan Association, with the operative joiners, in connection with the notice and counter-notice of alterations to working rules was held on Thursday, January 21st. The operatives chiefly demanded reduced hours in summer and winter months, irrespective of a rise in wages. This demand is made with the idea of employing more men than are at present employed. Other points dealt with in the notice and counter-notice were of a merely local nature. A further meeting in regard thereto will be held in the course of a week or so.

There is nothing to report from Altrincham, Ashton-under-Lyne, Birkenhead, Blackpool, Bolton, Burnley, Chester, Crewe, Darwen, Heywood, Lancaster, Leigh, Liverpool, Longridge, Macclesfield, Middleton, Preston, Radcliffe, Rochdale, Southport, St. Annes-on-Sea, Stockport, Wallasey.

THE YORKSHIRE FEDERATION.

Secretary; J. DAVIDSON, 14, Park Row, Leeds.

The annual report for the year ended November 30th, 1908, of the Yorkshire Federation of Building Trade Employers states that the interest in the monthly meetings has been fully sustained, and that the attendance of the representatives of the affiliated local associations has been maintained.

The influence of the Federation, it is reported, is steadily growing, and is manifested in some degree by the civic welcomes which have been again accorded the members during the year. It is felt that in this way the beneficent aims and objects of the Federation will be made more widely known, and their pacific intentions more fully appreciated. The Council have pleasure in recording the election of Councillor J. Birch, who has for many years been an active member of the York Association, as the Lord Mayor of York.

The continued experience of the conciliation boards has realised and justified the highest anticipations of their usefulness and practical utility. All matters which have arisen in Yorkshire have been mutually settled by the Local Conciliation Boards, whose proceedings have been conducted in an amicable and friendly spirit. A proposal has been made that the question of the establishment of a Local Conciliation Board should be left entirely to the discretion of each local association. After careful consideration, the Council were strongly of opinion that it would be inimical to the best interests of employers to make such a drastic change in a fundamental principle until more extended experience of the working under normal conditions was available. An application from the builders' labourers for admission into the privileges of the conciliation scheme has been carefully considered. It is recommended that any local association which has mutually adopted rules with the bricklayers' labourers for the governing of rates of wages and conditions of labour, should consider, in conjunction with the operatives who are parties to the local conciliation board, the expediency of admitting the labourers as members of such board. The Northern Centre Conciliation Board has been requested to consider any labourers' question that might be referred to them, on condition that the parties making the appeal should meet all expenses in connection therewith. During the year most Local Boards have agreed upon the area which the Conciliation Boards cover, and these almost invariably, as recommended by the Federation, follow the area in which the working rules apply.

The Council have viewed with deep regret the many claims made by the operatives in the Lancashire and Cheshire districts. Some of these were felt to be absolutely unwarranted, and not to be justified by the present condition of trade. Notwithstanding these requests, the Federation, after consulting with the local associations, passed a unanimous resolution that it was not opportune at the present time to give notice for a general reduction in wages so far as Yorkshire is concerned.

With a view to extending the policy of conciliation, the Council recommended local conciliation boards, in order that they may be made effective in the settlement of disputes, to consider any matter of trade interest outside their area or jurisdiction, on the written application of the parties concerned that the matter in dispute is submitted to the board as arbitrators.

Careful consideration was given to the proposals of the President of the Board of Trade for the establishment of a Court of Arbitration, and the compiling of official lists of panels of chairmen, employers and operatives, to hear and consider any trade dispute which might be referred to it. In view of the great interest which building trade employers have at stake, representations have been made to the Board of Trade to include on the panels the names of representative employers, not only of the National Federation, but also of the county federations.

Having regard to the fact that disputes or differences occasionally arise between members, and the desirability of maintaining cordial and friendly relations, the Federation have appointed an Arbitration Committee to consider any matter which may arise, and which it is mutually agreed shall be referred to the determination of the said committee.

The Federation have published a pamphlet showing the serious economic and trade disadvantages which accrue from municipal works departments, and the Council are glad to learn that it exercised some influence during the recent municipal elections. The character of the relief works undertaken for the unemployed, and the method in which they are carried out, demands most careful attention, otherwise they may prove a further menace to the trade, and could easily form the nucleus of a works department.

The National Federation is taking active steps to secure the recognition of the use of the National form of contract by architectural societies, Government departments, and local authorities. The Council have approached the West Riding County Council, and have recommended local associations to deal in the first instance with the local authorities in their area. A circular letter has been addressed to Yorkshire architects inviting their attention to the use of the National form of contract, and also requesting that contractors might have early intimation of the result of their tenders, that certificates, especially the final one, may be promptly issued, and that an item be inserted in quantities to cover workmen's compensation. The responses to the circular have been very gratifying.

One of the most important branches of work in connection with the Federation is that carried out by the Employers' Parliamentary Council. The activity of the Labour Party during the past two or three years makes it absolutely necessary that every Bill introduced into Parliament should be most carefully scrutinised, with a view to protecting and safeguarding the interests of members.

The Departmental Committee appointed by the Home Secretary to inquire into the accidents attendant on building operations have presented their report during the year. The Council made urgent representations to the Home Secretary on such matters as they considered were not satisfactory, and by which employers were likely to be seriously prejudiced. The Hon. Secretary has introduced into Parliament a Building Operations and Engineering Works Bill, which, it is gratifying to find, contains some of the suggestions made by building trade employers. Steps have been taken to combat any drastic amendments which may be moved either in committee or in Parliament.

The attention of the Council was drawn to the enormous work which would be involved if the detailed particulars enumerated in the Board of Trade returns were accurately compiled. The Council, having been assured that the Board of Trade would be satisfied with totals only, recommended members to adopt that method of filling up the returns.

The Council has given most careful consideration to the returns which have to be furnished to the Home Secretary under Section 12 of the Workmen's Compensation Act, 1906. The Home Office desires that the returns furnished should relate solely to compensation paid for accidents arising on permanent premises which come under the classification of factories. As these accidents form a very small proportion of the claims paid under the Workmen's Compensation Act, the Council impressed upon the Home Office the necessity of ensuring that the returns only included the risks asked for, as building trade employers might easily be seriously prejudiced by insurance companies furnishing statistics which included the whole of the claims paid for workmen's compensation.

The value of the collective insurance scheme of the Federation will be appreciated from the financial benefit which has accrued to the Federation, viz:—£[illegible] 9s. 4d. The experience up to the present has been an unqualified success. Every claim has been promptly paid, and all the permanent cases have been settled by a commuted payment.

The influence of the Federation has been actively given in the protection of several members during the year. This intervention has invariably been to the benefit of the member directly concerned, and should lead all members to appreciate the great power which the Federation can exercise when they take up a case on behalf of a member.

The National Federation has completed arrangements whereby "The Builders' Journal" becomes the official organ of the National Federation. This will be the sole medium of official communications from the National and county federations and local associations. The paper has already earned a splendid reputation among architects and builders, and members are most earnestly requested to become subscribers, in order that the National Federation may obtain the fullest diplomatic and financial advantages which a well supported official paper should undoubtedly bestow. Terms of subscription may be obtained from the local secretaries.

The Council regret that they have not been successful during the year in obtaining the affiliation of other Master Builders' Associations. The difficulties experienced arise mainly from the continued depression in trade and the consequent inactivity of the operatives. Negotiations are taking place which, it is hoped, will prove successful at an early date.

The Officers and Executive Council for 1909 are as follows:—President, Mr. W. R. Thompson; senior vice-president, Councillor W. G. England; junior vice-president, Mr. A. J. Forsdike; treasurer, Mr. W. T. Ledgard; secretary, Mr. J. Davidson, 14, Park Row, Leeds.

LOCAL ASSOCIATIONS AFFILIATED TO THE YORKSHIRE FEDERATION.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

The annual dinner of the Barnsley Federation of Building Trade Employers, in conjunction with the Barnsley Master Builders' Association, was held at the King's Head Hotel, on Friday, January 8th.

Mr. C. D. Potter (president of the Master Builders' Association) was in the chair, and was supported by Councillor G. Haigh (president of the Federation), the Mayor of Barnsley (Alderman E. J. Rideal), the Deputy Mayor (Councillor J. S. Rose), Councillor W. G. England, J.P. (senior vice-president of the Yorkshire Federation), Mr. H. Crawshaw, and Mr. E. W. Dyson (who represented the local architects), Mr. T. Bottomley (president of the Huddersfield Federation), Mr. S. Coop (president of the Dewsbury Federation), and Mr. T. Smith, secretary of the Sheffield Association. In all fifty-eight sat down to dinner.

Before the toast list was proceeded with, reference was made to the death of one of the members (Mr. H. Oxley). After the customary loyal toasts, Mr. T. Smith, of Sheffield, proposed the "Local Associations," and in the course of his remarks referred to the fact that every firm of note in Barnsley belonged to the Federation.

Councillor G. Haigh, in replying, said that, although trade had been depressed, they at Barnsley had taken a firm stand against any lowering of wages. The chairman also replied.

Mr. E. Broley, in proposing the "Mayor and Corporation," referred to the continued good feeling between the corporation and the building trades, and to the continued advancement in sanitary arrangements in the borough of Barnsley. The Mayor, in replying, remarked that, although their building by-laws were, perhaps, obsolete, yet if they made them in accordance with the Local Government Board's requirements they would be worse than ever. More breathing space was provided under the old by-laws than under the new.

Councillor J. S. Rose, the deputy mayor, remarked that Barnsley's rates were lower on the average than most towns of similar class. Councillor W. G. England, J.P., said that he shared the optimism that the building trade had now taken a turn for the better. Mr. J. Smith, in proposing "The Architects," referred to the National form of contract, which, he contended, ought to be universally accepted. Mr. E. W. Dyson responded.

The usual monthly meeting of the association, coming so soon after the dinner, was not very well attended, and no business of importance was transacted.

HALIFAX ASSOCIATION.

Secretary: A. E. Dalzell.

The usual monthly meeting of the Halifax Association was held on January 7th, at Exchange Chambers, Northgate, Halifax, Mr. Lewis Firth, president, in the chair.

The association delegate's report of the monthly and annual meetings of the Yorkshire Federation held at Wakefield, December 17th, last was presented, and the minutes of both meetings were read by Mr. Naylor.

Members were urged to support the "Builders' Journal" as the official organ of the Federation.

With reference to the Yorkshire Federation's recommendation that federated employers were to obtain a written statement from all workmen engaged that they were not subject to the disabilities named, viz., "industrial disease or physical infirmity," as a false statement in this respect would seriously prejudice their claim to compensation under the Workmen's Compensation Act, correspondence has taken place between the Yorkshire Federation and the association.

ROOFING SLATES.
Velinheli, Penrhyn and Westmorland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

NATURAL ROCK ASPHALTE
(Compressed or Mastic)
For Horizontal and Vertical Damp Coursing
For Flat Roofs, Basements and other floors.
The French Asphalte Co., Ltd.
(ESTABLISHED 1871)
Supply only the best material from their own mine of St. Jean de Maruejols, combined with the best workmanship.
Complete satisfaction given to the leading Architects.
Apply for Prices:—
5, Laurence Pountney Hill, Cannon Street, E.C.

THATCHING AND
REED LAYING.
J. G. COWELL, SOHAM.

LAUNDRY
and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE.
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

HOLLIS BROTHERS
& CO.,
Timber Importers.
HULL. Jameson Chambers.
LEICESTER. Queen Street.
Wood Block Flooring.

H. B. Hardwood,
Floorings,
Oak, Maple, etc.
Large Stocks of Joinery Wood held under cover.
Mouldings, etc., to design.

Telephone: No. 82 CENTRAL (2 Lines.)
Telegrams: "ELF, BIRMINGHAM."
SUTTON & ASH,
41, SNOW HILL, BIRMINGHAM.
JOISTS CHANNELS,
ANGLES, TEES,
RIVETTED GIRDERS,
LIGHT ROOFS &c.

Members were urged to support the Federation insurance scheme.

A discussion arose as to the necessity for contractors to protect themselves against the liability for efficacy of work carried out by the direction of architects, but which builders, by their practical knowledge and training, realised would be inadequate or insufficient to fulfil the purpose intended. It was thought that protests should be set out in writing, the contractors definitely stating that they would not be responsible if the work carried out as originally intended and ordered, proved inadequate at any future time. In the course of the discussion, many cases were cited in which the contractor had been charged for such faulty designing.

The submitting by builders of plans for proposed alterations and additions was discussed, and it was resolved, on the motion of Mr. Raynor, seconded by Mr. Lewis Firth, that this association would assist the Halifax Architectural Society by refusing to carry out work designed by unqualified practitioners, and also the members would pledge themselves not to prepare plans of alterations or additions to buildings.

SELBY ASSOCIATION.

Secretary: Chas. Maw.

A meeting of the Selby Master Builders' Association was held at the George Hotel, Selby, on Friday evening, January 15th, the president (Mr. H. Connell) in the chair. The delegates gave a report of their visit to the Yorkshire Federation's monthly meeting at Wakefield. Representatives were also appointed to attend the Leeds meeting and dinner. An interesting discussion on several matters of trade importance followed.

SHEFFIELD ASSOCIATION.

Secretary: Thos. Smith.

The monthly meeting of Sheffield Master Builders' Association was held on January 14th. The president (Mr. T. Eshelby) presided, and the attendance of members was the largest for some considerable time, although several members who usually attend the meetings were unavoidably absent.

The treasurer's report showed the association to be still making steady progress, the subscriptions for the year being the largest on record.

Six new members were elected, which, with the 20 elected at last meeting, made a substantial addition to the membership roll.

The president, vice-president, and committee were nominated for the annual meeting, there being 15 nominations for the 12 vacancies on the committee.

A letter was read from the Builders' Merchants' Association, saying that that association had not yet had an opportunity of discussing the suggested terms of the Master Builders' Association, with respect to preferential trading.

The special committee appointed to consider the adoption of a day-work price-list had not yet concluded their investigation, but they had obtained particulars from several associations, and were of opinion that a price-list would be as great an advantage at Sheffield as at the other places where it was in operation.

The question of a uniform summer holiday week was again discussed, but nothing definite was absolutely fixed. While the August Bank Holiday week was not exactly an ideal time in all respects, yet it had to be taken into account that if the holiday were not fixed for this date, works would in any case be closed down for some days, and it was therefore only a question of an additional day or two.

Attention was called to an instance of alleged wasteful expenditure on the part of the City council in making a sewer 21ft. deep, for a purpose for which there appeared no justification beyond the additional expenditure of about £600, as it was not a case in which sewerage was intended to be provided for at a lower level. The matter was referred to the Vigilance Committee.

YORK ASSOCIATION.

Secretary: J. Hague.

The York Association has, on behalf of the electricians carrying on private trade in the city, again taken up the question of the proposed opening of show-room for sale and display of fittings by York Corporation Electricity Committee. The following letter was sent the town clerk:—January 4th, 1909. —Dear Sir,—This association views with considerable alarm and apprehension the renewed proposal to be introduced at to-night's council meeting, to open a showroom for the sale of electricity fittings in the city. The prospect is a very discouraging one, and the principle dangerous to all private enterprise. It is submitted that municipal authorities should never place themselves in competition with, or undertake work that will be detrimental to the private trader. Numbering, as we do, amongst our many members, the whole of the private electrical firms trading in the city, we take this opportunity of speaking out on this question and endeavouring to prevent a pernicious principle being introduced into the city. The municipal authorities should not, it is submitted, do more than supply current to the consumer. To undertake the sale and fixing of fittings (invariably at an inadequate and cut rate) is unfair to the private traders who are ratepayers, and can only result in their being compelled to close their establishments. Submitting this letter to your kind consideration, and trusting that you will bring the same before the council meeting.—Yours faithfully, J. Hague.—H. Craven, Esq., town clerk, York.

At the council meeting held the same night, Mr. Councillor Hopkins moved that the following paragraph of the minutes be referred back:—"It was decided to give the Electricity Committee the first refusal of the rental of the remaining portion of the premises in Spurringate for use as a showroom"—and remarked that the matter was referred to in the above letter. This meant a step in municipalisation, which, if once taken, they would not easily be able to retrace. They were going to form a precedent. He objected to the proposal on the ground that it was an unfair form of competition on the part of the corporation. By such competition they would close up the small traders who were engaged in this business. Councillor Lambert supported, because of the way in which the question had been brought before the council: It was only the thin end of the wedge. The council divided on the amendment, the figures being: for, 14; against, 22; mutual, 5. The amendment was declared to be lost.

There is nothing to report from Barnoldswick, Bradford, Bridlington, Dewsbury, Grimsby, Harrogate, Huddersfield, Hull, Leeds, Malton, Morley, Scarborough, Shipley, Wakefield.

THE MIDLAND CENTRE OF THE NATIONAL FEDERATION.

Secretary: F. W. Amphlet, 58, New Street, Birmingham.

The annual meeting of the Midland Centre was held at the Imperial Hotel, Birmingham, on Thursday, January 14th, the president (Mr. Wm. Wistance) in the chair.

The minutes of the last half-yearly meeting, held at Walsall, on 15th July last, were read and confirmed.

The officers for this year were appointed as follows:—President, Councillor H. Smith (West Bromwich); vice-presidents, Col. J. Barnsley and Mr. Albert S. Smith (Birmingham); auditors, Messrs. F. H. Fish (Nottingham), and J. H. Walker (Derby); treasurer, Mr. H. Willcock (Wolverhampton). Mr. Albert S. Smith explained that, very much to their regret, Alderman T. E. Lowe did not see his way to continue in office. Messrs. J. Wright and Albert S. Smith were re-nominated as the two representatives of the Centre on the Administrative Committee of the National Federation Col. J. Barnsley and Messrs. J. H. Walker, J. H. Kellett, A. Brazier, and H. Willcock, were re-appointed as the five representatives of this centre on the National Conciliation Board. The following gentlemen were appointed as the representatives on the Midland Centre Conciliation Board:—Messrs. W. Yates, W. Wistance, J. Stokes, F. H. Fish, H. Cave, Councillor H. Green, J. B. Whitehouse, A. W. Chamberlain, Councillor H. Smith and R. Weston. The following gentlemen were elected as the eight representatives of the National Council: The president, Col. J. Barnsley, Albert S. Smith, W. Wistance, F. G. Whittall, J. Wright, A. Chambers, and H. Willcock. The annual report stated that there had again been freedom from serious labour troubles during the year. The difficulties which had arisen had mostly been satisfactorily dealt with by the Conciliation Boards. The associations affiliated to the centre were the same as last year. County Alderman J. Bowen, who had served the Centre faithfully since he was appointed first president in 1898, had retired from business, but was retaining his association with the Federation by becoming a private member.

Four meetings of the Midland Centre Conciliation Board had been held. At the first meeting, in January, a dispute with the Wolverhampton bricklayers was settled. The second was the annual meeting in May, when the officers were elected. At the third meeting, a dispute with the bricklayers, carpenters, and labourers at Leicester was considered, but no definite decision was arrived at, this being the first case which the Board had been unable to settle. It was referred to the National Board, and decided in favour of the operatives. The fourth meeting was held to consider a dispute between a firm of Liverpool contractors engaged on a job in Birmingham, and the local bricklayers. It dealt with the rate of payment to night-gangs, and was decided in favour of the operatives.

General satisfaction had been expressed with the arrangement arrived at by the National Federation in regard to making "The Builders' Journal and Architectural Engineer" the official organ of the Federation. The Executive Council earnestly hoped that every member of the centre would become a subscriber.

During the year the Secretary had met and addressed the following associations:—Burton-on-Trent, Bromsgrove, Derby, and King's Norton and Northfield. The collective insurance scheme with the Law Car and General Insurance Corporation, Ltd. (for insurance against workmen's compensation risks), had again been well taken up by a number of associations. It was saitsfactory to record that not a single complaint had reached the Secretary in regard to the settlement of claims. During the year the following meetings had been held:—Executive Council, 6; Emergency Committee, 3; Finance Committee, 2; Collective Insurance, 1.

The accounts showed a balance in hand of £40 0s. 10d. It was estimated that when the unpaid subscriptions were remitted there would be a credit balance of £62 12s., in addition to the sum of £55 13s. contributed to the Midland Centre reserve fund. The cash in hand on account of the National reserve fund was £51 4s. 3d., of which £25 was due to the National Federation. The report was approved and adopted.

The revised set of rules for the Centre was approved, and it was decided that 1,000 copies of same should be printed and a sufficient number sent to each local association, so that each member may receive a copy. It was also decided to hold another Conference of Midland Centre Secretaries in the spring. The secretary was instructed to send a report of the annual meeting to the "Builders' Journal," and it was understood that this should serve as a notification to the members of the business transacted.

The Secretary stated that, since drawing up the annual report, he had received a letter from Mr. B. R. Peploe, giving fuller particulars of the collective insurance scheme. The letter was read to the meeting.

The officers and the Birmingham representatives of the Executive Council were re-elected as the Emergency Committee. The Birmingham representatives on the Executive Council, together with the president, were appointed as the Finance Committee. The members of the Emergency Committee, together with Messrs. J. Wright, H. Cave, A. Chambers, F. W. Harris, A. W. Chamberlain, and R. P. Gathercole, were reappointed as the Collective Insurance Committee. The president, and Messrs. Albert S. Smith and J. B. Whitehouse, were appointed as the Organisation Committee.

The following resolution was passed:—"It having been reported to this meeting that an architect to a certain County Education Committee declines to accept tenders from builders for work to be carried out under him unless priced quantities are sent in with the tender, it is resolved that the National Administrative Committee be requested to take such steps as they may deem desirable to prevent the growth of this practice."

The notice given by the Northern Centre with reference to proposed alterations to the National Conciliation Board rules was considered. The general feeling of the meeting was against the proposed alterations. Mr. W. Yates called attention to what he considered a growing abuse, viz., the employment of a large number of operators by private firms, who were not strictly speaking in the building trade. It was generally agreed that it would be a difficult matter to deal with.

THE SOUTH-EASTERN CENTRE OF THE NATIONAL FEDERATION.

COMPOSED OF

The London Federation, The Southern Counties Federation, and The Eastern Counties Federation.

Secretary: T. COSTIGAN, 31 & 32, Bedford Street, Strand, London, W.C.

THE LONDON FEDERATION.

Secretary: T. COSTIGAN, 31 & 32, Bedford Street, Strand, London, W.C.

A council meeting of the London Master Builders' Association was held at 31 and 32, Bedford Street, Strand, W.C., on January 21st, when the following business was transacted:—(1) Correspondence with the Board of Trade re Operative Stonemasons' Society, and request for submitting the question of piecework to arbitration. (2) Correspondence re Colchester Lunatic Asylum. (3) Proceedings adopted with regard to the L.C.C. (General Powers) Bill, 1909. (4) Election of Mr. J. W. Jerram, of East Ham, as member of this association.

THE EASTERN COUNTIES FEDERATION.

LOCAL ASSOCIATIONS AFFILIATED TO THE EASTERN COUNTIES FEDERATION

GREAT YARMOUTH ASSOCIATION.

Secretary: R. J. Hill.

The number of members to date of the Great Yarmouth Association is forty-seven. The Secretary regrets to report that only four members responded to the circular convening a monthly meeting for January 5th, and that therefore no business was transacted. Members are reminded that the association's meetings are held on the first Tuesday in each month.

ASSOCIATIONS IN IRELAND.

MONTHLY REPORT.

BELFAST ASSOCIATION.

Secretary: J. McAulay, Solicitor.

The annual general meeting of the Belfast Association was held on January 26th, at the offices, 12, Mayfair, Arthur Square, Belfast, the president, Mr. John Martin, J.P., presiding. Before entering on the business of the meeting, the president stated that the death had occurred, on the previous Sunday, of one of their valued colleagues, Mr. W. J. Campbell. Mr. Robert B. Henry, J.P. (vice-president) and Mr. W. H. McLaughlin, J.P., also made references to the deceased member, and the secretary was instructed to convey to his son, Mr. J. O. Campbell, an expression of the members' sympathy.

The annual report, which was unanimously adopted, included the following references:—

The committee are not without hope that a substantial increase of business will shortly be experienced throughout the country. Already there is much encouragement in the trend of public affairs, and, judging from the improvement and activity that have already animated our principal local industries, the outlook, fortunately, is not only gratifying, but decidedly hopeful, at home.

The price of materials has considerably fallen during the year, but the cost of labour has undergone no change.

Considerable correspondence has passed, and much information has been obtained, during the year in respect to the National Federation of Building Trade Employers, and it is interesting and important to know that in connection with the Federation monthly reports, from a large number of builders' associations in Great Britain, are published in the "Builders' Journal," an excellent medium, which may be reliably commended to the support of members.

The friendly relationship subsisting between the Ulster Society of Architects and this association, the committee are pleased to say remains unaltered. With regard to contracts, however, no official form has yet been arranged.

With reference to open competitions for contracts, it is remarked that "a more conscientious sense of equity should prevail." A recognised standard rate of wages should be an element in every tender. Builders should support one another more than they do; they should also recollect that the prices obtained for contracts during the past year are not only below, but are inconsistent with, the value and importance of the work, and must only entail a loss.

The election of office-bearers resulted as follows:—President, Mr. John Martin, J.P.; vice-president and hon. treasurer, Mr. Robert B. Henry, J.P.; committee, Messrs. J. O. Campbell, J. Courtney, H. Keith, J. Lees, W. H. McLaughlin, J.P., J. Miskimmon, John Smith, and W. J. Stewart; Ulster representative on Council of National Federation of Builders, Mr. Robert B. Henry, J.P.

LONDON
JAMES BROWN (LONDON), LTD.,
MAKE THE BEST
HOLLOW POROUS BRICK PARTITIONS
In 1½ in., 2¼ in., 3 in. and 4 in. thicknesses.
Takes a Nail Perfectly
ESSEX WHARF, WHITECHAPEL, E.
—— Telephone, 9513 Central. ——

Telephone, No. 1062 HOLBORN.
Contractors to H.M. Government, &c.
THE PERFECT TILE CO.,
13 & 15, Featherstone Buildings,
Holborn, LONDON, W.C.
OPAL WALL TILES. GLAZED WALL TILES.
Tessellated and other Floor Tiles.
Terrazzo and Cube Mosaics to any Design.
Fireproof Partitions. Fireproof Jointless Floors.
AGENT FOR "MODERNIA" GLASS TILES

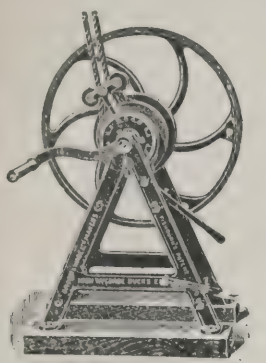
T.A.—"DESICCATOR, LONDON." Tel.—2663 Avenue
Established 1854.
STEPHINGS, SON & BYERS,
Timber Merchants. Desiccating Works,
Sawing and Planing Mills.
ADELINA GROVE, MILE END, LONDON.
Speciality; DESICCATED OAK FLOORING.

Send for Prices and Particulars of
FRAZZI FIREPROOF
FLOORS & PARTITIONS.
Frazzi Fireproof Construction, Ltd.,
Essex Wharf, Durward Street,
WHITECHAPEL.

BIRKBECK BANK.
ESTABLISHED 1851.
SOUTHAMPTON BUILDINGS, HIGH HOLBORN, W.C.
2½ PER CENT. INTEREST
allowed on Deposit Accounts.
2 PER CENT. INTEREST
on Drawing Accounts with Cheque Book.
All general Banking Business transacted.
ALMANACK with full particulars, POST FREE
C. F. RAVENSCROFT, Secretary.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs,
Premier Ironworks,
DEPTFORD, S.E.

SPRAGUE ELECTRIC
ELEVATORS.
SPRAGUE ELEVATOR CO. LTD.,
QUEEN ANNE'S CHAMBERS,
WESTMINSTER,
LONDON, S.W.



Reduce your Wages by using

BROOM & WADE'S

PATENT HOIST.

This is the most Efficient Hoist on the market for hoisting barrows of bricks, concrete, &c., without Gearing.

BROOM & WADE, LTD.,

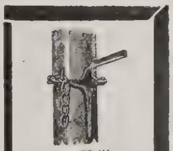
Engineers, HIGH WYCOMBE.

'SCAFFI XER' Block

REVOLUTIONISES SCAFFOLD FIXING.

Supersedes the Scaffold Cord and Wedge. Practically Indestructible. Never Slackens or Slips.

Immense Saving in Time and Labour.



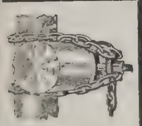
Patent Utility Scaffolding Bracket.

D. P. JONES' Patent Rapid

SCAFFOLDING BLOCK

And Utility Bracket.

FIXED IN ONE MINUTE. RELEASED INSTANTLY.



Used as Ledger and Standard Tie.

Write for particulars to THE

PATENT RAPID SCAFFOLDING
& APPLIANCES SUPPLY CO.,
287, Upper Richmond Rd., Putney, S.W.

Contractors for the Supply, Hire, or Erection of Scaffolding.

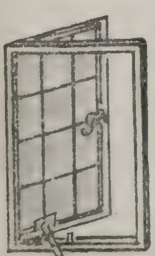
Telephone: 18 Putney.
Telegrams—"SCAFFIXER, London."

Used as Single or Band Tie.

REA METAL CASEMENTS, LTD.,

Stanley,

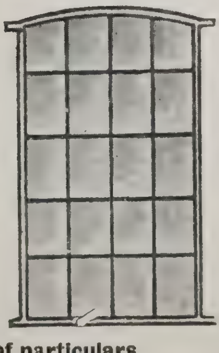
Liverpool.



Manufacturers of METAL WINDOWS for every class of BUILDING.

Leaded Lights, &c.

Telegrams: "ENLIGHTEN."
Telephone, 365 OLD SWAN



Special Quotations on receipt of particulars.

The Renowned

Andrews-Hawksley

Patent Tread

Applied to Wood, Iron, Stone or Concrete Stairways, Floors, Landings, Platforms, Non-Conducting Floor Plates for Electric Light and Power Stations, Pavement Covers, etc., etc.

Pioneers of all Stair Treads.
The Tread that has lasted a lifetime.
There is nothing to equal it in the Market.

Quotations given for Concrete Steps fitted complete with our Treads.

Great Western Railway Power Station, Shepherd's Bush.

Used by Great Western Railway, London and North Western Railway, London Brighton and South Coast Railway, Great Northern Railway, Midland Railway, North Eastern Railway, North British Railway, Lancashire and Yorkshire Railway, etc.

Specialists in Light Constructional Work in Iron or Steel; Special Work in Wrought or Cast Iron; Staircases of every description; Concrete and Granolithic Work, etc.

THE ANDREWS-HAWKSLEY PATENT TREAD & ENGINEERING COMPANY,
Columbia Works, Prestons Road,
POPLAR, LONDON, E.

Telephone No 700 Eastern.
Telegrams: "Uniflorous London."

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion - 1s. 6d.
Each additional line - - - - 6d.
Three insertions* - - - - 3s. 0d.

*This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bourne End, Bucks.—For villa residence in Cores-End, Bourne End, for Mr. A. W. Johnston. Mr. J. Deacon, architect, Marlow, and Mr. H. Stanton Webber, architect and surveyor, Maidenhead:—

Lovell and Son	£667	0	0
W. and T. Sellman	631	16	0
J. Gearing and Son	559	0	0
H. Harris and Son,* Little Marlow Road, Marlow	519	0	0

*Accepted

Great Berkhamsted.—For the removal of the existing iron superstructure, carrying the King's Road over the Grand Junction Canal. and the erection of a new steel bridge. for the Urban District Council. Mr. E. H. Adey, surveyor:—

Somerval and Co., Dalmuir ...	£1,343	0	0
Rubery, Owen and Co., Darlaston	1,270	0	0
Heenan and Froude, Ltd., Manchester	1,230	0	0
E. C. and J. Keay, Ltd., Birmingham	1,222	10	0
A. Findley and Co., Motherwell	1,110	0	0
G. Sands and Son, Nottingham	1,100	0	0
Drew, Bear, Perks, and Co., London	1,081	0	0
J. Tildesley and Co., Darlaston	1,049	7	6
Rawlingsons and Co., London...	1,001	0	0
J. C. Brettle and Co., Worcester*	982	5	0

*Accepted.

Healing, Lincs.—For erection of an elementary school and teacher's house at Healing, for the Lindsay County Council (Education Committee). Messrs. Scorer and Gamble, architects, Bank Street Chambers, Lincoln:—

Parker and Son, Boston ...	£2,785	0	0
Holmes and Richardson, Grimsby	2,575	10	0
Allison, Grimsby	2,548	0	0
Elmes, Gainsborough	2,518	9	0
Thompson, Grimsby	2,498	0	0
Marrows, Grimsby...	2,422	12	0
T. Hickman, Market Harborough	2,395	0	0
T. W. Wainer, Nottingham ...	2,386	0	0
Mawer Bros.,* Kidgate, Louth	2,348	15	0

*Provisionally accepted.

Ingoldmells, Lincs.—For erection of an elementary school at Ingoldmells, for the Lindsay County Council (Education Committee). Messrs. Scorer and Gamble, architects, Bank Street Chambers, Lincoln:—

H. Ailsby, Chapel St. Leonards, near Alford	£1,650	0	0
Parker and Son, Boston... ...	1,550	0	0
Barnes and Co., King's Lynn...	1,435	0	0
T. Bow, Nottingham	1,420	0	0
T. H. Cade, Boston	1,397	13	0
J. Kime, Candlesby, near Burgh	1,377	0	0
Richardson, Boston	1,335	0	0
Mawer Bros., Louth	1,323	12	6
A. J. Elmes,* North Street, Gainsborough	1,273	0	0

*Provisionally accepted.

Kelvedon, Essex.—For additions to Prested Hall, near Kelvedon, for Mr. N. N. Sherwood. Mr. J. W. Start, F.S.I., architect, Colchester. Quantities by the architect:—

Dobson and Son, Colchester ...	£2,737
Thorn, Tiptree	2,735
Barrell, Wivenhoe	2,719
Kimberley, Banbury	2,690
Roper, Ipswich	2,667
T. J. Ward, Colchester	2,618
Theobald, Chappel	2,601
Spencer, Santo, Ltd.	2,581
Mason and Son, Haverhill	2,476
Chambers, Colchester	2,348
Deaves, Bures	2,317
Smith and Son, Witham	2,315
Beaumont,* Colchester	2,133

*Accepted.

Morpeth, Northumberland.—Accepted for the work of erecting a new Council school to accommodate 520 scholars at Morpeth, for the Northumberland Education Committee.

Robson and Waddle, Blyth, Northumberland, £6,793 17s. 11d.

Wallington, Surrey.—For erection of a pair of cottages in Grosvenor Avenue. Mr. Douglas Weightman, architect, 78, North End, Croydon:—

Crossley and Sons	£855	0	0
Tugwell	725	0	0
Howe and White	697	10	0
Cheshire	697	0	0
Everitt	675	0	0
Roberts and Tilbury	649	0	0
Sanders*	630	0	0

*Accepted.

(*Tenders continued on page viii.*)

Carbolineum
Avenarius
REGD.

Wood Preservative
Antiseptic
and Disinfectant

Undoubtedly the Best Wood Preservative known

Cheaper and more effective than paint.

Invaluable for the protection of Wooden Buildings, Fences, &c.
Gives a nice nut-brown colour.
Horses will not bite wood treated with it.
Has been proved a success for the last twenty years in this Country and is used regularly on many of the largest Estates.

C. A. PETERS, Ltd., DERBY.
116, NEWGATE STREET, LONDON, E.C.
And 8, CASTLE STREET ARCADE, LIVERPOOL.

Agents for Scotland:
The Glasgow Patents Co. Ltd., 120, Great Wellington Street GLASGOW
Agents for Nottinghamshire and Lincolnshire:
W. Robinson, (Nottingham) Ltd., 7 & 9, Victoria Street, NOTTINGHAM
Agents for Leicestershire:
W. Robinson, (Nottingham) Ltd, Churchgate, LEICESTER

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork.

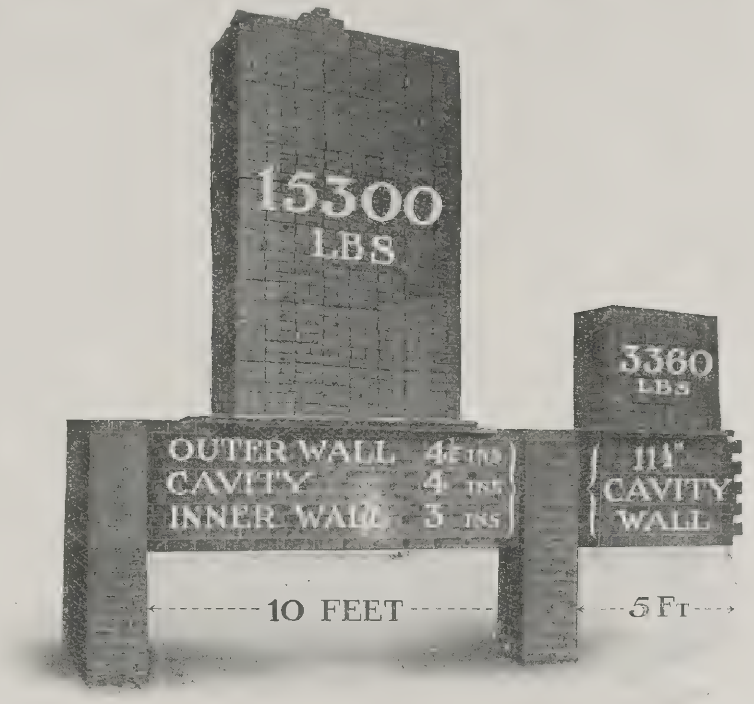
H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

RD. JOHNSON CLAPHAM, & MORRIS, Ltd.,



Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered
Soundproof,
Fireproof
Dampproof,

Architects, Builders, and Contractors

Write for Descriptive Catalogue.

Engineering Department,
24, Lever Street, MANCHESTER.

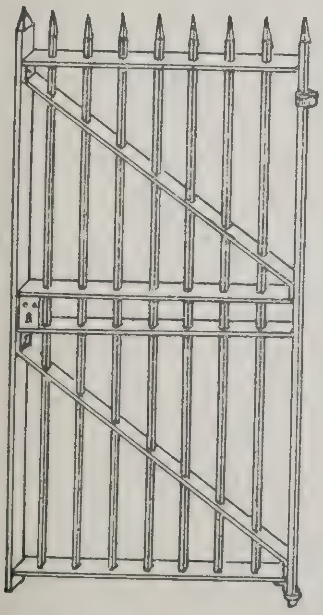
Telegrams; "Metallicus, Manchester."

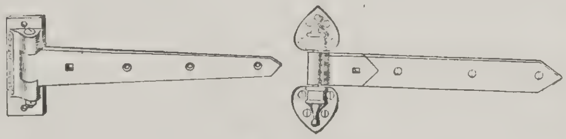
Hollow Wall and Cantilever constructed of 4½ in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

Telephone: 6437 Manchester.

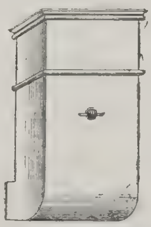
IRONWORK FOR COUNCIL SCHOOLS

GENERAL BUILDERS' IRONWORK.

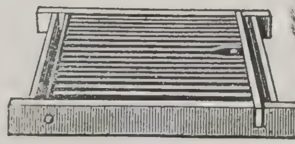


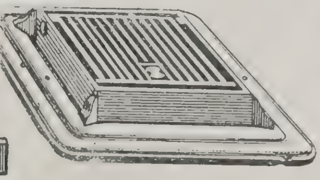


GATES . . and . . . RAILINGS.



TOBIN TUBES and GULLY GRATES.





PATENT HAT AND COAT RAILS.

CLARK, HUNT & CO., Ltd., *Middlesex Ironworks,* **Shoreditch, London.**

GENERAL CATALOGUE ON APPLICATION.

(Tenders continued from page vi.)

Hengoed.—Erection of a surgery, etc., at Hengoed, for Dr. Richards. P. Vivian Jones, P.A.S.I., architect, Hengoed, via Cardiff :—

Davies and Francis...	£389	10	0
Williams and Sons	385	0	0
G. and D. Jones	365	0	0
E. T. Davies	360	18	0
D. and T. Jones	331	10	0
Vodden and Lee	310	0	0
C. and T. Jones	292	10	0
V. W. Cosslett*	274	5	0

*Accepted.

Little Coates, Lincs.—For erection of an elementary school at Little Coates, for the Lindsay County Council (Education Committee). Messrs. Scorer and Gamble, architects, Bank Street Chambers, Lincoln :—

Smith, Great Grimsby	£8,671	0	0
Holmes and Richardson, Grimsby	8,627	0	0
W. Kirton, Grimsby	8,431	12	0
Thompson and Son, Grimsby	8,302	17	0
H. Marrons, Grimsby	8,179	0	0
T. Hickman, Market Harborough	7,900	0	0
A. J. Elmes, Gainsborough	7,866	9	0
Mauer Bros., Louth	7,797	17	7
Longden, Neepsend, Sheffield...	7,749	0	0
Parker and Son,* Wormgate, Boston	7,280	0	0

*Provisionally accepted.

London, N.—For receiving ward accommodation at the St. John's Road Workhouse, Upper Holloway, N., for the Islington Guardians. Mr. W. Lockwood, architect, 12, Sherwood Street, Piccadilly Circus, London, W. Quantities by Mr. T. Thompson, 90, Cannon Street, E.C. :—

Stapleton and Sons	£3,470	0	0
Warburton and Son	3,020	0	0
Newell and Lusby	2,977	19	3
Spencer Santo	2,970	0	0
W. Lawrence and Son	2,849	0	0
Kirk and Randall ...	2,768	0	0
Stevens and Sons ...	2,706	0	0
W. Johnson and Co.	2,695	0	0
Dearing and Co. ...	2,683	0	0
T. Hickman ...	2,650	4	3
Sprossom and Babb	2,649	10	3
M. Calman and Son	2,637	0	0
W. H. and R. Roberts ...	2,627	0	0
F. Deacon and Son	2,598	0	0
Mallock Bros.	2,577	0	0
W. H. Hyde and Co.	2,575	0	0
A. and R. Lowe and Co.	2,519	0	0
F. Webster and Son	2,499	0	0
F. and G. Foster ...	2,488	0	0
C. P. Roberts and Co. ...	2,479	0	0
McLaughlin and Harvey,* 13, Brecknock Road, N.W.	2,291	6	3

*Accepted.

Oswestry, Salop.—For erection of a Sunday school, for the English Baptist Church. Mr. W. J. Oliver, M.S.A., architect, 1, Darlington Street, Wolverhampton, and Oswestry :—

G. Bickerton	£910
J. Higgins	855
W. H. Thomas...	845
Jones and Evans, Oswestry	830

Amended Tenders.

G. Bickerton	688
W. H. Thomas	625
Jones and Evans*	620

*Accepted.

St. Mary Cray, Kent.—For erection of the St. Mary Cray Council school, for the Kent Education Committee. Mr. W. H. Robinson, architect :—

W. R. Taylor, St. Mary Cray ...	£4,677
J. T. Jarvis and Sons, Erith	3,574
S. A. Douglass, Woolwich	3,500
Friday and Ling, Erith ...	3,410
Jones and Andrews, Beckenham	3,395
B. E. Nightingale ...	3,336
W. Downs, Walworth, S.E.	3,333
G. Browning, Canterbury	3,280
A. E. Tong, Gravesend ...	3,276
W. F. Blay, Ltd., Dartford	3,258
T. Knight, Craybrooke Works, Sidcup	3,257
A. S. Ingleton, Herne Bay	3,247
J. Lonsdale, London Road, Swanley	3,199
R. A. Lowe and Co., Chislehurst ...	3,187
J. Wilford, Snodland	3,160
J. Parren and Son, Huntingdonshire	3,150
H. Somerford and Son, Orpington ...	3,118
R. Cook and Sons, Crawley	3,110
G. E. Wallis and Sons, Ltd., Maidstone	3,090
J. A. Davison, West Malling ...	3,050
F. Webster and Son, East Dulwich...	3,049
T. Crossley and Son, Bromley...	3,038
E. Bishop and Sons, Sittingbourne ...	3,010
F. Smith and Co., Abchurch Lane, E.C.	2,999
F. and G. Foster, Norwood Junction	2,982
J. Podger and Sons, Bromley...	2,938
E. W. Jacobs, Anerley	2,926
C. E. Skinner,* Chatham	2,922
W. H. Hyde and Co., Norwood Junction†	2,700

*Recommended for acceptance. †Withdrawn.

Stanton-under-Bardon, Leics.—For erection of a new elementary school, at Stanton-under-Bardon, to accommodate 150 children, together with out-offices, drainage, and other works connected therewith, for the Education Committee of the Leicestershire County Council. Messrs. Harding and Topott, architects, Hotel Street, Leicester :—

B. Shipman, Ratby	£3,150	0	0
A. Wileman, Loughborough	2,998	15	0
W. M. Sharp, Leicester ...	2,995	0	0
J. Chapman, Leicester ...	2,945	0	0
E. Orm, Coalville ...	2,907	0	0
A. Faulkes, Loughborough	2,885	0	0
Toone and Warrington, Anstey	2,849	10	0
E. Fox, Leicester...	2,849	0	0
A. B. Moss, Coalville	2,790	7	0
J. Marston and Son, Leicester	2,714	0	0
W. Haddon, Leicester	2,680	0	0
W. F. Harding, Loughborough	2,650	0	0
C. A. Dobson, Loughborough	2,645	0	0
J. T. Ball, Barrow-on-Soar	2,633	0	0
F. Sleath,* Rothley	2,575	0	0

*Conditionally accepted.

Watford.—For new manual instruction centre, Watford, for the Hertfordshire County Council. Mr. Urban A. Smith, county surveyor, architect, Hatfield :—

C. Hale and Co., Harringay	£827	0	0
T. Hickman, Market Harborough	808	13	8
C. H. Hunt and Son, High Wycomb	793	16	4
F. and G. Foster, Norwood Junction	788	0	0
C. Eames	758	0	0
L. R. Ensor	758	0	0
G. Jaggard, Bushey	755	19	8
Clark Bros.	747	6	0
J. Darvill	742	0	0
Haycock and Son, Leicester	740	0	0
C. Brightman and Son	737	15	0
A. E. and C. Shaw ...	727	17	11
W. and D. Wilkins	723	0	0
Bracey and Clarke ...	705	6	6
Clifford and Gough ...	687	0	0

Architect's estimate, £764.
Rest of Watford.

Worthing.—For erection of a public elementary school at Broadwater, for the Corporation :—

G. Potter, Horsham	£6,248	0	0
W. H. Hyde and Co., Norwood Junction	6,026	0	0
A. Peskett and Co., Crawley ...	6,015	0	0
Merry and Frost	5,725	0	0
J. Longley and Co., Crawley ...	5,637	0	0
R. Cook and Son, Crawley	5,595	0	0
A. Crane	5,532	2	2
F. A. Moat ...	5,490	0	0
Sandell Bros. and Ball*	5,338	0	0

Borough surveyor's estimate, £5,650.
Rest of Worthing.
*Accepted.

Ynyswen, Wales.—For erection and completion of 22 houses at Kenry Street, Ynyswen, Treorchy, Rhondda Valley, for the Ynyswen Building Club. Mr. W. D. Morgan, M.S.A., architect, 194, Ystrad Road, Pentre :—

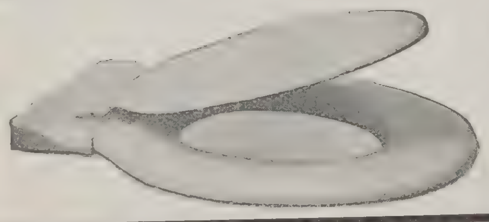
Kirkhouse and Ford	£5,170
D. Rees	4,730
T. Dwyer	4,675
E. Williams	4,675
Dutfield	4,543
G. Hallett, Cardiff	4,500
H. Rowlands*	4,433

Rest of Treherbert.
*Accepted.

LIGHTNING CONDUCTORS
Supplied, Erected and Tested. Chimney Shafts Restored, &c.
J. LEWIS, 5 & 6, Great Winchester Street LONDON, E.C.
TELEPHONE No. 3053 CENTRAL.

FOLDING PARTITIONS.
REVOLVING SHUTTERS.
Hartley Bros.,
2/- ft. Super.
1/- ft. Super.
GORTON, MANCHESTER.

All that is best in
ACCIDENT AND ILLNESS INSURANCE
of every description can be obtained at prices to suit all pockets on application to
THE OCEAN ACCIDENT AND GUARANTEE CORPORATION, LTD.
Branch Office: 233, STRAND, W.C. Fire, Burglary and Motor Car Insurance.



SANITARY SEATS.
INDENTS THROUGH SHIPPERS.
EAST BROTHERS,
Lochee Cabinet Factory,
DUNDEE, SCOTLAND.
THISTLE (REGD) BRITISH MANUFACTURE

TILES. MOSAICS. FAIENCE.
CRAVEN DUNNILL & CO., LTD.,
Jackfield, S.O., Shropshire.
ENAMELS. LUSTRES. WALLS.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Feb. 11. ELDWICK, BINGLEY.—Erection of detached residence. Apply William Rhodes Nunns, M.S.A., Market Street, Bingley, by Feb. 11.

Feb. 11. LLANFAIR P.G.—Erection of council school for Anglesey Education Committee. Tenders to R. H. Williams, secretary of Education, Education offices, Llangefni, by ten a.m., on Feb. 11. Apply, Jos. Owen, F.R.I.B.A., county architect, Menai Bridge.

Feb. 11. MICKLETON.—Erection of new buildings, repairs, and fencing for the Gloucestershire Small Holdings Committee. Apply Shire Hall, Gloucester. Tenders by 9 a.m., on Feb. 11, to F. Peter, small holdings surveyor, Shire Hall, Gloucester; £1 1s. deposit.

Feb. 11. BRIDLINGTON.—Erection of retaining wall, with palisading, also dwarf wall and palisading for the corporation. Apply E. R. Matthews, A.M.I.C.E., borough surveyor, town hall, Bridlington. Tenders, by Feb. 11, to A. E. Matthewman, town clerk, town hall, Bridlington.

Feb. 11. BUGLE, ST. AUSTELL.—Erection of new gallery, vestry, entrances, and other alterations at United Methodist Church. Apply, Manse, Bugle, and F. C. Jury and Son, architects, Tregonissey Road, St. Austell. Tenders to Rev. M. W. Chandler, The Manse, Bugle, by Feb. 11.

Feb. 11. TREFDRAETH.—Erection of council school for Anglesey education committee. Apply Bodra Golwyn Farm, Trefdraeth, or to Jos. Owen, F.R.I.B.A., county architect, Menai Bridge. Tenders to R. H. Williams, secretary of education, education offices, Llangefni, by 10 a.m., on Feb. 11.

Feb. 12. HORRABRIDGE.—Erection of two semi-detached houses. Apply, 8, Princess Square, Plymouth on and after Feb. 12.

February 12. AINTHORPE.—Erection of four houses. Apply R. Lofthouse and Sons, architects, 129, Albert Road, Middlesbrough, and submit tenders by February 12.

Feb. 12. PLYMOUTH.—Extension of Devon and Cornwall Homœopathic Hospital. Names and addresses to F. A. Wiblin, architect and surveyor, 92, Old Town Street, Plymouth, by Feb. 12.

Feb. 12. DUDLEY.—Erection of male classification ward and extensions at Dudley Union Workhouse. Apply Gaius W. Coster, clerk to guardians, union offices, Dudley, to whom submit tenders by 10 a.m. on Feb. 12; £1 1s. deposit.

Feb. 12. BRYNMAWR (Mon.).—Rebuilding Old Castle Inn, Brynmawr, Mon., for A. Buchan and Co., Rhymney Brewery, Rhymney. Apply T. Roderick, architect, Clifton Street, Aberdare. Tenders to T. Edwards, Rhymney Brewery, Rhymney, Mon., by noon on Feb. 12.

February 13. FARINGTON.—Erection of additions to St. Paul's Church, Farington. Apply, J. A. Seward, architect, 148, Church Street, Preston, to whom submit tenders by February 13. £1 11s. 6d. deposit.

February 13. TONYPANDY.—Erection of new shop fronts. Tenders by February 13, to Mrs. Williams, Whitehall, Trealaw. Apply, R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy.

Feb. 13. BARMOUTH.—Alterations and additions to chapel. Apply R. R. Williams, Ty'ncoed Buildings, Barmouth. Tenders to Rev. E. Vaughan Humphreys, Porkington Terrace, Barmouth, by Feb. 13.

Feb. 13-23. LEYTON.—Erection of Council schools for the U.D.C. Apply, William Jacques, A.R.I.B.A., 2, Fen Court, Fenchurch Street, E.C. by Feb. 13. Tenders by hand at meeting of council at 7 p.m. on Feb. 23; £5 deposit (Bank of England note).

Feb. 13. BRIGHOUSE.—Erection of three-storeyed fireproof silk mill, boiler and engine house, at Thornhill Briggs Mills, for Wood Bros and Sons., Ltd. Following works required:— Masons, plumbers and glaziers, plasterers, reinforced concrete floor layers and roof asphalters, ironfounders, iron casement makers, and painters. Apply Sharp and Waller, architects, 32, Bradford Road, Brighouse, by Feb. 13.

Feb. 15. WINCHCOMB.—Alterations and additions to drill hall. Apply, Thomas Malvern, architect, 21, Winchcomb Street, Cheltenham, to whom submit tenders by noon on Feb. 15.

Feb. 15. DISTINGTON.—Erection of pair of cottages for Distington Iron Co. Apply W. G. Scott and Co., architects and surveyors, 2, Park Lane, Workington, to whom also submit tenders by Feb. 15.

Feb. 15. BANGOR, CO. DOWN.—Erection of two houses in Gray's Hill. Apply 97, Main Street, Bangor. Tenders by noon on Feb. 15, to Ernest L. Woods, A.M.I.C.E.I., 24, Mayfair, Arthur Square, Belfast.

Feb. 15. SOUTHAMPTON.—Conversion of shop spaces into tenements, for the corporation. Apply borough engineer's office. Tenders, before 2 p.m., on Feb. 15, to R. R. Linthorne, town clerk, town clerk's office, Municipal Offices, Southampton; £5 deposit (Bank of England note).

February 15. WIDNES. — Erection of garage repair shop, etc., for the corporation. Apply, John S. Sinclair, A.I.M.C.E., borough surveyor, town hall, Widnes. Tenders by noon, on February 15, to H. S. Oppenhein, town clerk, town hall, Widnes. £1 1s. deposit.

Feb. 16. TREORCHY.—Erection of three villas at Treorchy, for W. E. Davies and others. Apply W. D. Morgan, M.S.A., architect, 194, Ystrad Road, Pentre, to whom submit tenders by Feb. 16.

Feb. 17. LEEDS.—Repairs to schools for three years ending Feb. 29, 1912, for the Education Committee, as follows:—Bricklayer and mason, carpenter and joiner, plumber, slater, plasterer, smith and founder, heating engineer, concreter, painter. Apply, architect's section, education offices. Tenders by 10 a.m. on Feb. 17 to J. Graham, secretary for education, education offices, Leeds.

February 19. DUBLIN.—Erection of dispensary buildings for governors of Jervis Street hospital. Apply, D. W. Morris and Co., surveyors, 68, Harcourt Street, Dublin, and to William H. Byrne and Son, architects, 20, Suffolk Street, Dublin. Estimates to the secretary, by February 19. £2 2s. deposit.

Feb. 19. HEADINGLEY, LEEDS.—Construction of brickwork culvert for the Corporation. Apply waterworks engineer, Municipal Buildings, Leeds. Tenders to Chairman of the waterworks commitee, Town Hall, Leeds, by 10 a.m. on Feb. 19.

Feb. 19. TAUNTON.—Erection of detached residence for head-master for the Council of Taunton school. Apply, architect's office. Tenders by first post Feb. 19, to F. W. Roberts, F.R.I.B.A., architect, 2, Hammet Street, Taunton.

Feb. 19. PONTARDAWE.—Extension of Alltwen Congregational Chapel, and addition of organ chamber. Apply, secretary, R. E. Thomas, Paris House, Pontardawe. Tenders to the secretary, W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff, by Feb. 19; £3 3s. deposit.

Feb. 20. SHEFFIELD.—Erection of new ward blocks and kitchens at Royal Infirmary. Names to Gibbs and Flockton, architects, 15, St. James's Row, Sheffield, by Feb. 20.

Feb. 20. TREDEGAR.—Erection of a chapel for the Bethania Congregational Church. Apply, W. S. Williams, architect, Elmwood House, Tredegar, to whom submit tenders by Feb. 20.

Feb. 20. DONCASTER.—Reconstruction of Golden Lion Hotel, Cleveland Street. Apply, James Heseltine, architect and surveyor, Old Castle Drawing Office, Pontefract, to whom submit tenders by Feb. 20.

Feb. 20. WINSFORD.—Erection of classrooms, lecture room, etc., at United Methodist Free Church School, High Street, Winsford. Tenders to F. Plumbley, 217, High Street, Winsford, by noon on Feb. 20. Apply Alfred Price and Son, architects and surveyors, Sandbach.

Feb. 22. NORTHENDEN.—Erection of school for the Cheshire C.C. Names and addresses to the clerk by Feb. 10. Tenders by 11.30 on Feb. 22, to Walter Taylor, clerk to the sub-committee, Technical School, Sale; £2 deposit.

Feb. 22. COVENTRY.—Erection of buildings at Foleshill Works, for the Corporation. Apply Fletcher W. Stevenson, engineer and general manager, Gas Works, Coventry, to whom submit tenders by 9 a.m. on Feb. 22; £1 1s. deposit.

Feb. 22. BURY ST. EDMUNDS.—Converting large room at town hall into public offices, etc., for the corporation. Apply borough surveyor's office. Tenders by noon on Feb. 22, to Walter D. Harding, Assoc.M.Inst.C.E., borough surveyor, town hall, Bury St. Edmunds; £2 2s. deposit.

February 22. TODMORDEN.—Erection of new secondary school for the Corporation. Apply architect, Jesse Horsfall, F.R.I.B.A., 4, Chapel Walks, Manchester, and Burnley Road, Todmorden, on and after February 15. Tenders, addressed

Chairman of Education Committee, to James Whitehead, clerk to committee, education offices, Roomfield, Todmorden, by February 22.

Feb 24. PONTYPOOL.—Erection of additions to hospital, Pontypool. Apply Sidney Williams, M.S.A., architect, Borough Chambers, Wharton Street, Cardiff. Tenders to B. Nicholas, J.P., Osborne House, Pontypool, by noon on Feb. 24; £1 1s. deposit.

February 24. CANTERBURY.—Erection of cottage at lunatic asylum, for the corporation. Apply, Jennings and Gray, architects, 4, St. Margaret's Street, Canterbury. Tenders to chairman at asylum, by 10 a.m., on February 24. £3 deposit.

February 24. LIVERPOOL.—Construction of additional buildings to open-air bath, for the corporation. Apply, engineer and chief superintendent (W. R. Court), municipal offices, Liverpool. Tenders by February 24, to Edward R. Pickmere, town clerk, Liverpool.

February 25. MORLEY.—Alterations to engine house and new engine bed at Gillroyd Mills. Apply, on or after February 16, to T. A. Buttery, F.I.A.S., architect, Queen Street, Morley, and 1, Basinghall Square, Leeds. Tenders to the company's offices, by February 25

Feb. 25. HODDESDON.—Erection and completion of school for the Hertfordshire C.C. Apply County Surveyor's Office, Hatfield, on and after Feb. 12. Tenders by 5 p.m. on Feb. 25, to Urban A. Smith, county surveyor, county surveyor's office, Hatfield; £2 2s. deposit.

Feb. 26. LUTON.—Erection of school buildings for the Corporation. Apply, J. R. Brown and Sons, architects, Castle Street, Luton. Tenders by noon on Feb. 26, to Bruce Penny, town clerk, town hall, Luton; £1 1s. deposit.

Feb. 27. COLCHESTER.—Erection and completion of superstructure of main building at Mile End, for the visiting committee. Apply, architect's office, on site at Colchester. Tenders by 10 a.m. on Feb. 27, to W. P. Gepp, clerk to the visiting committee, New Street, Chelmsford; £100 Bank of England note deposit.

March 1. MITCHELSTOWN (Ireland).—Erection of Convent National Schools in Mitchelstown. Apply Coroner Rice's offices, Fermoy. Tenders, by 10 a.m. on March 1, to W. Canon Rice.

ENGINEERING.

Feb. 15. WAKEFIELD.—Re-building, in steel girders, concrete, and masonry:—1, Aldham Bridge; 2, Rawfolds Bridge; for West Riding Highways Committee. Apply, F. G. Carpenter, West Riding surveyor, County Hall, Wakefield, to whom submit tenders by 10 a.m. on Feb. 15; £1 deposit.

Feb. 24. EDMONTON.—Engineer's work, cold and hot water supplies, atmospheric steam heating, gas supply, and fire hydrant, etc., at the new infirmary, for the guardians. Apply Alexander Drew, C.E., 64, Victoria Street, Westminster, S.W. Tenders, by 9 a.m. on Feb. 24 to F. Shelton, solicitor and clerk, White Hart Lane, Lower Tottenham.

Feb. 26. NETTESWELL.—Widening bridge in parish of Nettleswell, for Essex C.C. Apply, chief surveyor's office, Chelmsford. Tenders by Feb. 26, to Percy J. Sheldon, M.Inst.C.E., chief surveyor, office of chief surveyor, Chelmsford.

IRON AND STEEL.

Feb. 11. NORTHFLEET (KENT).—Supplying unclimbable wrought iron fencing for the U.D.C. Apply, J. A. Mitchell, district surveyor, the Hill, Northfleet, to whom submit tenders by 5 p.m. on Feb. 11.

Feb. 12. SOUTHAMPTON.—Erection of iron fire-escape staircase for the Corporation. Apply borough engineer's office. Tenders before 4 p.m. on Feb. 12, to education offices, St. Mary's Road; £5 deposit (Bank of England note).

Feb. 12. SOUTHAMPTON.—Supplying cast-iron pipes and special castings for the Corporation. Apply, waterworks engineer, French Street, Southampton. Tenders by 10 a.m. Feb. 12, to R. R. Linthorne, town clerk, town clerk's office, Municipal Offices, Southampton; £5 deposit (Bank of England note).

Feb. 13. DUNDEE.—Supply and erection of from one to four iron sheds for trustees of the Harbour. Apply, J. Hannay Thompson, M.Inst.C.E., harbour engineer, harbour engineer's office, Dundee, to whom submit tenders by 10 a.m. on Feb. 13.

Feb. 16. MANCHESTER.—Supplying cast-iron rubber-jointed pipes, for the Corporation. Apply, J. M. M'Elrop, general manager, tramways department, 55, Piccadilly, Manchester. Tenders, to chairman of tramways committee, 55, Piccadilly, Manchester, by 10 a.m. on Feb. 16.

PAINTING.

Feb. 12. SHEFFIELD.—Internal and external painting at Castlefold's Market, for the Corporation. Apply, city architect, town hall, Sheffield. Tenders by noon on Feb. 12, to R. M. Prescott, town clerk, town hall, Sheffield; fair wages clause.

Feb. 15. GLASGOW.—Painting King's Bridge, and Polmadie Bridge, for the Corporation. Apply, office of public works, City Chambers, 64, Cochrane Street. Tenders by noon on Feb. 15 to A. W. Myles, town clerk, City Chambers, Glasgow.

Feb. 17. LEEDS.—Painting, etc., of property for the Corporation. Apply, W. T. Lancashire, city engineer, Leeds. Tenders, at town clerk's office, by 10.0 a.m. on Feb. 17.

Feb. 19. CHELSEA, S.W.—Cleaning, painting, and whitewashing at the public baths, for the Corporation. Apply, T. Holland, town clerk, town hall, King's Road, S.W., to whom submit tenders by noon on Feb. 19.

PLUMBING & SANITARY

Feb. 11. BRIDLINGTON.—Demolition of lavatories and erection of new lavatories for the Corporation. Apply, borough surveyors' office, town hall. Tenders, by Feb. 11, to A. E. Matthewman, town clerk, town hall, Bridlington.

Feb. 13. STAINES.—Excavating for and constructing in concrete, carcassing of set of filter beds, for the U.D.C. Apply, E. J. Barrett, Assoc.M.Inst.C.E., engineer, town hall, Staines, to whom submit tenders by Feb 13.

Feb. 16. THURNSCOE.—Construction of sewer for the U.D.C. Apply, R. Higginbottom, surveyor to council, Thurnscoe Tenders by Feb. 16, to J. Ledger Hawksworth, clerk to council, Bolton-upon-Dearne, Rotherham; £1 1s. deposit.

Feb. 17. BIRMINGHAM.—Construction of stormwater sewer for the Corporation. Tenders by Feb. 17, to Henry E. Stilgoe, M.Inst.C.E., city engineer and surveyor, Council House, Birmingham; £5 deposit; fair wages clause.

Feb. 17. KINGSTON-UPON-THAMES.—Supplying and fixing five sludge presses for the Corporation. Apply R. Hampton Clucas, borough surveyor, at Municipal offices. Tenders by Feb. 17, to Harold A. Winser, town clerk, municipal offices, Kingston-upon-Thames.

Feb. 17. BODMIN, CORNWALL.—Laying 12in. stoneware pipes, constructing manhole, etc. Apply, engineers, S. W. Jenkin and Son, Parade, Liskeard, or at clerk's office, Mountfolly, Bodmin. Tenders by noon on Feb. 17, to M. F. Edyvean, clerk to the visitors, Bodmin; £1 1s. deposit.

Feb. 19. BACUP.—Construction of sewage conduit for the Corporation. Apply, borough engineer, Bacup. Tenders, by Feb. 19, to Joseph Entwistle, town clerk, Bacup; 10s. 6d. deposit.

Feb. 25. IPSLEY.—Construction of liquefying tanks, screening chambers, and bacterial filters, at Ipsley, for the Redditch U.D.C. Apply, Arthur J. Dickinson, engineer and surveyor, council offices, Redditch. Tenders by 5 p.m. on Feb. 25, to Browning and Hobson, solicitors, joint clerks to council; £1 1s. deposit.

ROADS AND CARTAGE.

Feb. 11. GREENWICH.—Paving roadway and footways for the corporation. Apply borough engineer and surveyor's office, town hall, Greenwich Road, S.E. Tenders, before noon on Feb. 11, to Francis Robinson, town clerk, town hall, Greenwich Road, S.E. Fair wages clause.

February 13. BEDFORD.—Supplying broken granite, slag, tarmacadam, flints, gravel, and cartage of road materials, for the C.C. Apply, office of county surveyor, Shire Hall, Bedford. Tenders, by noon on February 13, to county surveyor.

February 13. LEIGH, LANCS.—Supplying grit setts, barns flags, concrete flags, kerbstones, channel stones, macadam, chippings, sewerage pipes, castings, pitch, creosote oil, for the corporation. Apply Tom Hunter, borough surveyor. Tenders by noon on February 13, to Stanley Wilson, town clerk, town hall, Leigh.

Feb. 15. SELBY.—Supplying whinstone and dross until March 31, 1910 for the U.D.C. Tenders by Feb. 15, to Bruce McG. Gray, A.M.I.C.E., town hall, Selby.

Feb. 15. PLYMOUTH.—Sewering, making up, and completing new road for the Corporation. Tenders by 5 p.m. on Feb. 15, to James Paton, borough engineer, municipal offices, Plymouth.

Feb. 15. BANGOR, CO. DOWN.—Construction of 3 new Streets. Apply, 97, Main Street, Bangor. Tenders by noon, on Feb. 15, to Ernest L. Woods, A.M.I.C.E.I., 24, Mayfair, Arthur Square, Belfast.

Feb. 15. BEVERLEY.—Supplying stone for macadamising roads for the D.C. Tenders to F. G. Hobson, clerk to council, Newbeggin, Beverley, by Feb. 15. Apply, E. Picker, C.E., surveyor, Beverley.

February 15. HALE, CHESHIRE.—Works of street improvement for the U.D.C. Apply, S. A. Pickering, council's surveyor. Tenders by noon, on February 15, to J. G. Whyatt, clerk to council, council offices, Ashley-road, Hale, Cheshire. £1 1s. deposit.

Feb. 15. BANGOR, CO. DOWN.—Completing Ruby Street, Bingham Street, Crosbie Street, Albert Street. Apply, 97, Main Street, Bangor. Tenders by noon on Feb. 15, to Ernest L. Woods, A.M.I.C.E.I., 24, Mayfair, Arthur Square, Belfast.

February 15. STREATHAM.—Making-up and paving Parklands Road, Streatham, for the Wandsworth corporation. Apply, borough engineer's office, streets department, 56, East Hill, Wandsworth, S.W. Tenders in box at council house, East Hill, Wandsworth, S.W., by 4 p.m., on February 15. Fair wages clause.

February 17. TYNEMOUTH.—Supplying whinstone and limestone during year ending March 31, 1910, for the R.D.C. Apply, John Waters, district surveyor, Long Benton, Newcastle-on-Tyne. Tenders by February 17, to Augustus Whitehorn, clerk to the council, 66, Saville Street, North Shields.

(List of Contracts Open, continued).

February 18. TUNBRIDGE WELLS.—Paving, metalling, etc., parts Holmewood and Woodland roads, for the corporation. Apply, W. H. Maxwell, A.M.I.C.E., borough engineer and surveyor, town hall, Tunbridge Wells. Tenders by 9 a.m. on February 18, to W. C. Cripps, town clerk, town hall, Tunbridge Wells.

Feb. 19. ABERTRIDWR.—Paving, kerbing, channelling, etc., to 30 houses, for Graig Building Club. Apply, D. M. Davies, architect, 38, Cardiff Road, Caerphilly. Tenders by Feb. 19, to E. Brinson, secretary, 29, Cardiff Road, Caerphilly.

February 20. MAIDSTONE.—Supply and delivery of about 1,165 tons granite, for the R.D.C. Apply, Robert Hoar, clerk, 9, King Street, Maidstone, to whom submit tenders by February 20.

Feb. 22. HORWICH.—Sewering, levelling, paving, flagging, etc., for the U.D.C. Apply, Peter Taberner, clerk, council offices, Horwich, to whom submit tenders by Feb. 22; £1 1s. deposit; fair wages clause.

February 22. SPALDING.—Supplying granite, slag, shingle, and gravel, for the Union R.D.C. Apply, H. Stanley Maples, clerk to the council, Spalding. Samples to the union workhouse, by 9 a.m. on February 22.

Feb. 24. HOLLINGBOURNE.—Supply and delivery of road materials from March to Sept., 1909, for the R.D.C. Apply, H. J. Bracher, clerk to council, 33, Earl Street, Maidstone, to whom submit tenders by Feb. 24.

MISCELLANEOUS.

Feb. 16. PLYMOUTH.—Preparing and polishing wood floors of nurses' home and new infirmary for Incorporation of Guardians. Apply, master of workhouse. Tenders by noon on Feb. 16, to Wm. Adams, clerk to guardians, 13, Princess Square, Plymouth.

Feb. 16. BROMLEY.—Supplying timber, ironmongery, builders' materials, tools, oils, paints, etc., ironfounders' work, tar paving materials, steam road rolling, for the Corporation. Apply, Municipal Buildings. Tenders by 3 p.m. on Feb. 16, to Fred H. Norman, town clerk, municipal offices, Bromley, Kent; 10s. deposit.

Obituary.

The death has taken place at his residence, Richmond House, Boughton, Chester, of Mr. Edward Augustus Lyle Ould, F.R.I.B.A., of the firm of Messrs. Gravson and Ould, architects, of James Street, Liverpool. Mr. Hastwell Grayson has kindly supplied the following notes of the deceased architect's career:—Mr. Ould was born in 1852, at Tattenhall Rectory. After serving his articles in York, he spent some years in the office of Mr. John Douglas, of Chester. Rather more than twenty years ago he became a partner in the firm of Grayson and Ould. He was early regarded as an authority on half-timber work, which he studied both in England and in north-western France. He considered that it was especially necessary to follow precedent, both in the design and construction of timber work, and he strove with considerable success to get the same feeling that animated the buildings of the sixteenth and seventeenth centuries. A few years ago Mr. Batsford induced him to write a short book on examples of black and white work in Cheshire and Shropshire. Wightwick Manor, near Wolverhampton; Bidston Court, Thornton House, and Bank House, Tattenhall; in Cheshire; Bryn Estyn, near Wrexham; and Bryn Howell, near Llangollen; were his chief timbered houses. Numerous cottages and lodges, a branch bank at Crosby, and parish hall at Bromborough, were in the same style. The restoration of Hall-i'-the-Wood was intrusted to him. With his partners he was responsible for two churches at Liscard, Woolton parish church, and St. Barnabas, Rock Ferry. His larger houses include St. Helen's, Co. Dublin; Caer Hun, near Conway; The Hill, Hampstead, with a splendid picture gallery; Gatehouse, in Eskdale; Puddington Hall, in Cheshire; The Woodlands, near Southampton; and The Mount, near Wolverhampton; to the last has been recently added a large ballroom panelled in unpolished walnut. In Cambridge he built a block of rooms, and the Combination Room at Trinity Hall, also the Clergy Training College, and the recent additions to Selwyn College. About 300 cottages at Port Sunlight, and the schools, hospital, auditorium, and hotel there, as well as Messrs. Lever Bros.' premises in Dublin, were his work. Secondary schools were built by Messrs. Grayson and Ould at Harwarden, Chester, Liverpool, Carlisle, Whitehaven and Brampton, and there is one at Bootle in course of erection. As a young man, Mr. Ould gave a good deal of time to Volunteering, rowing, and amateur theatricals; in the last he greatly excelled. In appearance, in his manner of speaking, and in many little ways, he showed his Irish blood—the very twinkle in his eye attracted strangers and gained their confidence. He generally became the personal friend of clients and those who worked with him. Mr. Ould resided in Chester, where he was a member of the Beagles and the Chester Golf Club. He was President of the Liverpool Architectural Society a few years ago.

NEW MUNICIPAL WORKS.

The Local Government Board has decided to hold, or has recently held, as the respective dates indicate, inquiries into proposed expenditure by public bodies as follows:—Water supply works and plant:—Axbridge R.D.C., £700 for Blagdon (February 11); Saint Colomb Major R.D.C., £1,000 for Padstow Rural (February 9th); Pewsey R.D.C., £3,337 (February 12); Wells R.D.C., £4,000 for West Pennard (February 10); Scarborough B.C., £300 (February 11). Electric light and power supply works and plant:—West Hartlepool, £3,225 (February 12). Sewerage, drainage, and sewage disposal works and plant:—Daventry R.D.C., £8,250 for Weedon Beek (February 9); Birmingham C.C., £8,017 (February 9); Bodmin B.C. £618 (February 10); Leake R.D.C., £500 for Sutton Bonnington (February 10); Bolton B.C., £2,625 for Bolton and £7,016 for Ainsworth (February 10); Heathtown U.D.C., £5,400 for sewage farm (February 10); Leek R.D.C., £6,000 for Endon and Stanley (February 12); Carlisle R.D.C., £23,450 and £8,050 for Saint Cuthbert Without and Wetheral (February 10); Henley-on-Thames B.C., £6,300 (February 12). Street improvements, new roads, public walks, and pleasure grounds:—East Barnet Valley U.D.C., £475 (February 13); Hebburn U.D.C., £4,724 (February 9); Bromley B.C., £368 (February 15); Itchen U.D.C., £470 (February 9); Portsmouth B.C., £5,072 (February 10); Southend-on-Sea B.C., £3,351 and £334 (February 10); Orsett R.D.C., £890 for Little Thurrock (February 9); Plymouth B.C., £2,000 (February 12); Great Ouseburn R.D.C., £2,140 for Acomb (February 9); Bridlington B.C., £700 and £1,600 (February 10). Various:—Paignton U.D.C., 1,100 for public convenience (February 11); Portsmouth B.C., £9,500 for Milton Lunatic Asylum (February 10); Scarborough B.C., various plant, £1,000, public shelter, conveniences, etc., £640 and £160 (February 11); West Hartlepool B.C., £1,247, public conveniences, etc. (February 12); Bridlington B.C., £1,300 for lavatories reconstruction (February 10).

Coming Events.

Wednesday, February 10.

Edinburgh Architectural Association.—Mr. William Davidson on "Norfolk Church Rood Screens and their Paintings."

Birmingham Architectural Association.—Mr. J. A. Gotch, F.R.I.B.A., on "The Elizabethan House, as Illustrated by Contemporary Architectural Drawings."

Thursday, February 11.

Sheffield Society of Architects and Surveyors.—Prof. C. H. Reilly, M.A., on "The Grand Manner in Architecture."

Friday, February 12.

Edinburgh Architectural Association.—Associates' Annual Dinner.

Manchester Society of Architects.—Professor Beresford Pite, M.A., F.R.I.B.A., on "The Growth of Design and Craftsmanship in English Masonry and Woodwork," 6.30 p.m.

Monday, February 15.

Liverpool Architectural Society.—Mr. T. T. Rees, F.R.I.B.A., on "The Liability of Architects to Clients and Public."

Regent Street Polytechnic.—Mr. A. G. H. Thatcher on "English Methods of Scaffolding" (Series on Scaffolding), 8 p.m.

Tuesday, February 16.

Institution of Heating and Ventilating Engineers.—Annual General Meeting, 2.30 p.m.

Wednesday, February 17.

Edinburgh Architectural Association.—Mr. A. K. Robertson, Architect to the Scottish Education Department, on "Planning of Scholastic Buildings."

Thursday, February 18.

Concrete Institute.—General meeting. Mr. L. Serraillier, on "Certain Aspects of Reinforced Concrete."

L.C.C. Central School of Arts and Crafts.—Mr. Noel Heaton, B.Sc., F.G.S., on "The Materials of Construction and Decoration," 8.30.

Friday, February 19.

Birmingham Architectural Association.—Mr. Frank T. Baggalay, F.R.I.B.A., on "Roman Architecture."

Institution of Mechanical Engineers.—Annual General Meeting, 8 p.m.

Architectural Association.—Mr. A. Needham Wilson, A.R.I.B.A., on "The Poets and Architecture," 7.30 p.m.

Monday, March 1.

Liverpool Architectural Society.—Mr. E. Guy Dawber, F.R.I.B.A., on "Materials, and their Value in Relation to Domestic Architecture."

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following:

J. W. (Uddington). R. J. B. (Balham). T. W. P. (Prescot), B. W. F. (Bexhill), A. E. K. (Brentford), W. E. H. (Manchester), L. W. T. (Cardiff), H. A. (Dublin), H. L. G. (Cricklewood), G. C. (Gillingham), G. H. L. (Northampton), J. V. (Matlock), G. H. B. (Shipley), H. S. (Caterham), R. Y. M. (Northampton), J. E. W. (Sheffield), H. J. W. (Chiswick), G. B. (Northampton), W. H. (St. Leonards), R. T. D. (Smethwick), J. S. (Pontefract), J. C. (Stonehouse), F. L. (Stamford), J. B. (Northampton), A. B. (Waterfoot). G. F. B. (Millwall). H. C. N. (Llanfairfechan), H. D. (Middlesbrough), T. McH. (Bootle).

List of Official Appointments Vacant.

Inspector of Nuisances and Inspector of Petroleum (Lewes, Feb. 11).—Salary £140 per annum. Age not to exceed 45 years.—M. S. Blaker, Town Clerk's Office, Lewes.

Junior Assistant Clerk (London, S.E., Feb. 18).—Salary £45 per annum, rising to £55.—E. Pitts Fenton, clerk, 283, Tooley Street, London, S.E.

Clerk and Solicitor to the Council (Erith, Feb. 15).—Salary £475 per annum, rising to £575.—C. H. Fry, clerk to the council, U.D.C. Offices, Erith.

Surveyor-General of Highways (Isle of Man, Feb. 20).—Salary £200 per annum.—R. H. Cubbin, secretary to the board, Athol Street, Douglas, I. of M.

Assistant Engineer (Civil) (Douglas, I. of M., Feb. 11).—Salary £100 per annum. Age between 21 and 26.—M. Bridson, secretary, Isle of Man Harbour Commissioners, Douglas, Isle of Man.

Assistant in Borough Treasurer's Department (London, W., Feb. 17).—Salary, £70, rising to £100 per annum. Age between 19 and 24.—W. C. Leete, town clerk, Town Hall, Kensington. W.

Clerk in Education Committee's Office (Croydon, Feb. 18).—Salary £70 per annum, rising to £105.—J. Smyth, clerk. Katherine Street, Croydon.

Foreman of Works (Cardiff, Feb. 16).—Salary £110 per annum, rising to £115. Age not to exceed 40.—J. L. Wheatley, town clerk, City Hall, Cardiff.

Clerk of Works (Tumble, near Llanelly, Feb. 12).—For erection of Police Station.—J. W. Nicholas, Clerk to the County Council, County Offices, Carmarthen.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ADVERTISER (28), seeks re-engagement, ten years' thorough practical knowledge of building, estate management, and repairs, etc.; experienced in preparing plans and estimates, including quantities, for new works: highest refs. — Y., 86, Coniston Road, Muswell Hill, N. 4805

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill. 4809

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. 4828

ARCHITECT and Surveyor's Assistant desires engagement; 6½ years' sound provincial experience; good draughtsman, working drawings, details, colourist; perspectives, surveying, levelling; assist quantities; general routine, specimen drawings; highest references; moderate salary.—S. Osgood, Chelsfield Park, Orpington, Kent. 4801

ARCHITECT and Surveyor's Assistant (25), six years' London experience, design, surveying, quantities, Hon. Building Construction Inter.R.I.B.A.; excellent references; salary £2 2s.—Apply Box 4780, Builders' Journal Office.

ARCHITECT'S Assistant (23), desires engagement; 7 years' eaxperience.—Sedgwick, Belvedere Road, Sunderland.

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECT'S Assistant (23), late pupil, seven years' all-round experience, been clerk of works, working drawings, details, etc., knowledge of quantities and perspective.—E. P. Lee, 631, Commercial Road, London, E. 4781

ARCHITECTS, builders, estate agents (19), good energetic draughtsman, tracing, colouring, working drawings, etc.; willing to assist in office work; references.—F. J. Williams, 89, Shrubland Street, Leamington Spa, Warwickshire. 4796

ARCHITECT'S good all-round Assistant; 10 yrs.' exp. North, South, and Wales; quans., details, working drawings; mod. salary.—W. T., 14, Stanhope Road, Stockton-on-Tees. 4798

ARCHITECT'S assistant (23), **over 7 years' London and Provincial experience; excellent references; Inter.R.I.B.A. Exam. — H. J. Wilson, "Brinkdale," Park Road, Peterborough. 4670**

ARCHITECT and Surveyor's Assistant (21), seeks re-engagement; 5 years' experience in church and domestic work in larger provincial office; good draughtsman and colourist.—Box 4823, Builders' Journal Office.

ARCHITECT'S Junior Assistant (19), 4 years experience in West End Office, working drawings, details, perspectives, competitions, excellent references; salary 21s.—Box 4777, Builders' Journal Office.

ARCHITECT'S Assistant (23), seven and a quarter years' varied London and provincial experience. First-class draughtsman, details, surveying, and general routine. Excellent references. Inter. R.I.B.A.—H. J. Wilson, 90, Park Road, Peter borough. 4812

ARCHITECT'S, Surveyor's or Builder's Assistant (23), Inter.R.I.B.A., good draughtsman, levelling, surveying, specifications, assist quantities, supervision, estate work, correspondence, accounts; excellent references; moderate salary.—H. O'R., 80, Lavender Sweep, Clapham, S.W. 4810

ARCHITECT'S Assistant, thoroughly experienced, temporary employment; domestic work, business premises, schools, etc.; surveying and levelling, etc.; two years' experience in Structural Engineer's office; salary moderate. — Box 4820, Builders' Journal Office.

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

ARCHITECT, estate agent, or builder's assistant, experienced in all branches; good references.—R. S., Eagle House, Marine Parade, Clacton-on-Sea. 4816

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, Builders' Journal Office.

ASSISTANT (27), good rapid draughtsman, competent all branches, will accept small salary for re-engagement in or near London.—Ernest Frost, "Dunsmore," Horeham Road, Sussex. 4824

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

BUILDERS' Assistant desires situation; thorough knowledge plans, specifications, quantities, measuring; not afraid of work; salary not so much an object as permanent situation; 21; 5 years' experience.—Box 4839, Builders' Journal Office.

BUILDER'S general foreman, advertiser seeks engagement; 16 years' service as above with first-class London firm on important and various works; good references.—Address H., 150, Effra Road, Wimbledon, S.W. 4703

BUILDER'S or architect's assistant, 25, desires re-engagement, drawing, typewriting, shorthand, correspondence, accounts, and general office routine; also assist in quantities; excellent references, moderate salary.—Apply Box 4756, Builders' Journal Office.

BUILDERS' Assistant desires work; plans, estimates, setting out buildings, measuring up, prime costing, surveying, and levelling plots, ordering exact quantities, materials; 11 years' experience.—Box 4803, Builders' Journal Office.

BUILDER'S or Architect's Junior Assistant (18), good tracer, well up in prime cost, and general office work; excellent references; three years' experience. — J. W., 164, Wellesley Road, Ilford, Essex. 4833

CARPENTER, or Handy Man, tall; age 34; take charge on large jobs, wants work; 7 years' good reference; moderate salary.—H.C., Box 4838, Builders' Journal Office.

CLERK of Works seeks re-engagement; just finishing public building; varied experience, notably ferro-concrete construction; well recommended; testimonials most excellent; age 45.—A. B., Box 4814, Builders' Journal Office

CONTRACTOR'S outdoor manager and surveyor desires engagement; present situation 17 years; age 37; keen on variations; expert in measurements; all trades, quantities, estimating; town or country.—W., 2, Dalberg Road, Brixton. 4776

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.

ENGINEER, general, **wants permanent appointment, official or private staff; thorough all-round experience; electrical, plumbing, smith, married, 34; good testimonials.—86, Bathurst Gardens, Willesden. 4704**

ESTATE Owners.—Bricklayer, all-round, stone-waller, and general repairs; abstainer; good references; moderate wage for permanency.—Quinton, 12, Holland Road, Aston, Birmingham. 4802

FIREPROOF Engineers and Concrete Specialists. Advertiser, connected with above trades for 10 years, and whose name is well known in connection with same, desires position as manager, traveller, or head clerk; first-class book-keeper; aged 33; very moderate salary.—P. W. Potter, 73, Penshurst Road, Thornton Heath. 4719

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, Builders' Journal Office.

FOREMAN Painter (working) seeks re-engagement); experienced in all class work in building trade, as for general alterations, etc.; good supervisor, and reliable; either town or country; abstainer.—X. Y. Z., 8, Barton Street, Westminster. 4807

GENERAL Foreman seeks re-engagement, thoroughly practical in all branches; trade, carpenter and joiner, good draughtsman, first class references; town or country.—A. J., 196, Murchison Road, Leyton. 4804

GENERAL Foreman seeks re-engagement; alterations or new, practical experience in all branches; carpenter and joiner; good references; age 36; moderate wages.—Caplen, 3, Victoria Mansion, Edgware Road, Paddington, W. 4779

GENERAL Foreman seeks re-engagement, thoroughly practical and reliable; new or alterations; carpenter and joiner; life abstainer; first-class references.—Foreman, 3, Hawbridge Road, Leytonstone. 4787

HEATING.—Schemes, quantities and prices, tracing, workmen's sheets and costs; shorthand-typist (speeds 90/40); 5 years in Midlands; good refs.; disengaged.—Box 4834, Builders' Journal Office.

JUNIOR Assistant desires situation, home or abroad; good practical knowledge of construction and details; competent draughtsman and colourist, working drawings, measuring and supervising, surveying and levelling; moderate salary.—Box 4613, Builders' Journal Office.

PLUMBING, etc., Sanitary or Lead-laying, job wanted, day or piecework; anywhere; lowest prices; best work; excellent references; used to speculating or jobbing.—Squirrell, 47a, Woodland Street, Dalston, N.E. 4749

QUANTITY Surveyor's Assistant (21), **4 years' experience, desires engagement, certificates and good references. — Apply Box 4745, Builders' Journal Office.**

QUANTITY Surveyor's Assistant, temporary assistance rendered in taking-off, measuring variations, land surveys, dilapidations, etc., by experienced surveyor; references. — Box 4808, Builders' Journal Office.

REINFORCED concrete foreman, disengaged, long and varied experience, especially in Kahn bars and expanded metal, timbering a speciality; carpenter by trade; good refs.—G. C., 59, University Road, Tooting, London. **4721**

R.I.B.A. Final Exam., 7 years' experience, 1½ in Paris; good all-round man requires berth at home or abroad; good refs.; salary moderate.—Box 4799, Builders' Journal Office.

SURVEYOR'S, Architect's Assistant (27), good varied architectural, municipal and engineering experience; contract drawings, details, assist quantities, surveys, levels, etc., houses, schools, works, sewage works, roads, etc. Salary £2 5s.—Box 4811, Builders' Journal Office.

SHOP-FITTING, advertiser (38), well up in all branches of air-tight work, seeks situation as foreman in shop-fitting or joinery works; 9 successive years' with present employer.—Apply, Box 4837, Builders' Journal Office.

SUN copies, tracings, and plans prepared.—Geo. Tune, Trevor, Llangollen, N. Wales. 4831

SHOP or general foreman, good draughtsman, good all-round experience, including reinforced concrete work; or as estate manager, preparing plans for same, etc.; country preferred. — "St. Osyth," Goldsworth Road, Woking, Surrey. 4829

TO Estate Owners, builder, experience, in all trades, desires position as manager (working or otherwise); plans prepared, quantities, setting out, accounts and supervision; abstainer; country preferred.—Box 4806, Builders' Journal Office.

VOLONTAIRE.—Foreign gentleman (21) desires position in builder's office, with opportunity of learning.—B. B., 43, Bolingbroke Grove, Wandsworth Common, S.W. 4789

Appointments Vacant.

ARTICLED Pupil, vacancy for same in an old-established architect's and quantity surveyor's office, on the South coast; trained under principals; moderate premium; part returned. A typewriter will receive greater consideration.—Apply Box 4822, Builders' Journal Office.

BUILDERS' Junior Assistant wanted, accustomed to tracing and general office routine.—Apply, T. S. Foster, Builder, Abergavenny, Mon. 4840

REPRESENTATIVE Wanted by City Firm of Heating Engineers; must have connection amongst architects and practical knowledge of the business. Permanent situation with good salary to fully qualified man; state age and experience, with all particulars, to Box 4821, Builders' Journal Office.

WANTED, Traveller, to offer article in great demand for schools, hospitals, dwellings, specified by all eminent architects throughout the United Kingdom; commission. — "Sanatorium Iron Air Brick Co.," 58, Denmark Road, Southport. 4818

WANTED immediately, Architectural Assistant in public office in North, for 6 months, where a variety of work is being carried out, to prepare sketch plans from instructions, working and detail drawings, specifications, etc., with thorough knowledge of quantities; he must be a quick and good constructional draughtsman; salary, £2 5s. per week.—Apply, with copies of 3 recent testimonials, to Box 4836, Builders' Journal Office.

February 17, 1909. Volume 29. No.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: The R.I.B.A. President at Home; A Council of Fine Arts; Cutting Prices, 137; A "Jolligists'" Jubilee; The L.G.B. Report; Pulex Irritans, 138.
Planning of Secondary Schools. By H. T. Buckland - 139
Blackpool Central Library Competition - .41
Notes on Competitions - 144
Enquiries Answered - 145
FIRE—RESISTING CONSTRUCTION.
The Danger of Fire in Earthquake Zones - 147
High-pressure Fire Protection - 147
A Big Business Building in Berlin - 148
Hard Woods and Fire Resistance - 149
"Mon'lithcrete": A New Method of Construction - 151
Extensions at the Borough Polytechnic - 151
Cutting Prices: Is there a Remedy? - 151
Proposed New Works - 153
Works in Progress and Completed - 153
Federation News - 154
Trade and Craft - 156
Coming Events - 156
Complete List of Contracts Open xxiii., xxiv., xxvii.
Tenders - vi., viii.
ILLUSTRATIONS.
House at Sutton, Surrey. J. Watson Jerdan and H. Carpenter Emery, Architects - 139, 141
Blackpool Central Library Competition. Design placed first. Alex. Cullen, Lochhead, and Brown, Architects - 142-144
Use of Centrolinead - 140
The Passage Kaufhaus, Berlin: An Arcade of Shops Constructed of Reinforced Concrete - 148, 149, 150, 151
Extensions at the Borough Polytechnic: Diagram of Girder Construction, 151; View of the Hall, 152.

The R.I.B.A. President at Home. A very enjoyable evening was spent at 9, Conduit Street, on Monday, February 8th, by the guests of the President of the Royal Institute of British Architects, when the works of the Travelling Students for the year 1907—1908 were exhibited, and attracted a considerable amount of attention from the large and representative gathering of the profession present on the occasion. Mr. George Drysdale (Soane medallist and Tite prizeman, 1908) exhibited many good works of a varied and interesting character, comprising pencil sketches from (1) Venice (including drawings of the church of S. Maria della Salute and the Doge's Palace), (2) Florence (a bay of the Pitti Palace), and (3) Rome (the Farnese Palace, Santa Maria Maggiore, and the Cloister of S. John Lateran). Mr. Drysdale's coloured sketch elevations of a holy-water stoup from Siena Cathedral were as much admired for their admirable rendering of detail as was his large drawing of the Loggia dei Lanzi for its well-executed groups of sculpture. The Pora Pilo, Genoa, was represented by a sketch, in elevation, exhibiting a delightful vista as seen through the central archway. Other drawings and sketches included some studies of iron gates from Siena Cathedral. The works of Mr. Arthur R. H. Jackson (the Owen Jones student of 1907), which show commendable restraint in the colouring, comprised a large number of subjects from Venice, among which we may mention an interior view of S. Mark's and some well-drawn details of mosaics from various portions of that building. The Paolo Veronese ceilings of the Doge's palace, in which the figure subjects are extremely well delineated, were much admired. Mr. Jackson's contributions also included a detail drawing of the Scarlatti Chamber; a sketch of the Cloisters, Monreale, Sicily; a fountain near Santa Sophia, Constantinople; an interior of the Mosque of the Sultan Ahmed; and a scheme for the colour decoration of the vaulting of S. Mildred's, Bread Street, E.C. Mr. G. Salway Nicol (Tite prizeman, 1907) exhibited a series of able pencil sketches (perspectives), of which the rendering, albeit strongly reminiscent of Mr. J. B. Fulton's style, is to be highly commended. The subjects of his work cover a large field of study, and include doorways from Genoa, an interior perspective from Pisa, a sketch of the Capitol at Rome, the tomb of Lorenzo de Medici, the Pantheon, the Trevi fountain, and the Church of San Pietro, at Rome, and exterior and interior views of the Church of S. Maria della Salute, Venice, and a sketch of the staircase from the Palazza Regia Universita, Genoa. Mr. Harold Cooper (Soane medallist, 1907) showed some beautiful works in colour, including a large perspective of the West front of Orveito Cathedral and a finely rendered drawing of the Porta della Carta from the Ducal Palace, Venice; but we thought his sketch of the interior of the Council Chamber of the Castello S. Angelo, Rome, was rather crude in treatment. Mr. Cooper's studies in decorative work include the well-known friezes from the Papal apartments of the Castello S. Angelo, at Rome, and examples of Pompeian decorations and drawings of the beautiful lantern from the Church of S. Maria de Loreto, Rome. A series of delightful water-colour drawings served to enhance the attraction of Mr. Cooper's exhibition. Mr. S. G. Follett (Pugin Student, 1908) has made a special study of open-timber roofs, and among the admirable sketches he exhibited were some measured drawings of Broughton Castle, Oxfordshire, the old (14th century) barn at Bradford-on-Avon, the Manor House, Woodlands (near Mere), Wiltshire, Martock Manor House, Somerset, and the Monastery House, Shutlanger, Northants. Other subjects included the open roofs of the halls of the Chantry Farm, Stoke-under-Hamdon, Somerset, of the old Vicarage at Muchelney, and the curious octagonal timber roof over the kitchen of the Manor House, Stanton Harcourt, Oxfordshire. The fine linen panelling to be found in the seating of the Abbott's room at Muchelney Abbey, Somerset, was represented in a sheet of beautifully drawn full-size details. Mr. Follett is to be congratulated upon the sympathetic and delicate rendering of his pen-and-ink sketches.

A Council of Fine Arts. We are pleased to learn, from the "New York Times" of January 21st, that President Roosevelt, following a suggestion made by the American Institute of Architects of Washington, has created a Council of Fine Arts, and directed that, for the future, "before any plans are formulated for public buildings or grounds, or for the location or erection of any statue," the heads of executive departments, bureaus, and commissions must submit the matter to the Fine Arts Council, and follow their advice, "unless for good and sufficient reasons the President directs otherwise." The supervising architect of the Treasury is to act as executive officer for carrying out the recommendations of the Council, which is constituted as follows: — Architects: Cass Gilbert, C. Grant La Farge, Walter Cook, William A. Boring, S. B. P. Trowbridge, John G. Howard, Glenn Brown, Thomas R. Kimball, John H. M. Donaldson, George B. Post, John L. Mauran, D. H. Burnham, Arnold W. Brunner, Robert S. Peabody, Charles F. McKim, William S. Kemes, James Rush Marshall, Abram Garfield, Frank Miles Day, William B. Mundie, and C. Howard Walker, Painters: John La Farge, F. D. Millet, E. H. Blashford, and Kenyon Cox. Sculptors: Daniel C. French, Herbert Adams, H. A. MacNiel, and K. I. Bitter. Landscape Architect: Frederic Law Olmsted, jun. Although all lovers of art must approve the action of the President, we are scarcely surprised to hear that Congress was indignant at the order, which it regarded as a further encroachment on its rights and privileges, and it was pointed out that Congress, in appropriating money for public buildings, had hitherto usually specified, in a general way, what these buildings should be, and in many instances had named commissions to report on the plans. For instance, when Congress last year appropriated 2,500,000 dollars for a site for the Departments of State, Justice, and Commerce and Labour, the Secretaries of the three departments most interested were named (in addition to the Secretary of the Treasury and the Superintendent of the Capitol), as a Commission to advise Congress as to the best plans for buildings. Whilst we, somewhat sadly, wonder why practical questions affecting the welfare of the community which abroad can be thus met and successfully solved appear destined to remain unsolved in England for many years to come, we can only suppose, having regard to the fact that the standard of architectural education in America is far higher than in this country, that the President's action is merely the logical outcome of an intelligent appreciation of the architect's art which seems to permeate all nations but our own.

Cutting Prices. Mr. A. G. White, the Secretary of the National Federation of Building Trades Employers, speaking at the dinner of the Leicester Association of Master Builders, dealt tentatively and cautiously with the thorny subject of "undercutting." We are not sure that the National Secretary used that term, or whether he would approve of its application to the circumstances upon which he based his observations; the word is here adopted as expressing with convenient brevity the practice that is prevalent among builders, as well as amongst most other traders, of underbidding each other to such a degree that the "deal" becomes unremunerative or worse. This vice was never more prevalent than it is at the present time. Work being so scarce, the competition for it is proportionately keen, and it is not surprising to hear that in many instances the figuring is so close as to leave absolutely no margin for profit, and, indeed, to render highly probable an actual loss. It is said that just now the substantial builder is the chief offender. He wants to keep together his efficient staff, to maintain his effective organisation, to preserve his plant and machinery from deterioration which is worse than wear and tear, and to keep up appearances in offices, workshops, and yards, where the "abomination of desolation" would be but a poor advertisement for the firm; and so he reduces his tenders to the lowest limit. He can afford to "mark time" until the forward movement is resumed; but the comparatively small man, who must earn a profit in order to meet his expenses, suffers acutely from this unfair competition, which, moreover, must have a tendency to lower the tone of the whole market. But unfair competition is not peculiar to this time or to this trade. It is a chronic and perhaps an incurable canker of commerce and industry. Though a radical cure may be in the nature of things impossible, however, doubtless a good deal can be done to mitigate the mischief and to prevent it from spreading. Mr. White, handling the subject in a broad and philosophic manner, suggested certain directions in which remedies might be sought. The builder should enjoy greater facilities for ascertaining the state of the market in which, at present, for want of more accurate information, he operates more or less blindly and at random. Competitive tendering is bad enough, and is likely to endure, but ignorant tendering is worse, and is apparently amenable to treatment. It may perhaps be possible to gather and distribute such information concerning the current condition of the market as may render unnecessary the haphazard tendering of which so much is seen; but any such movement would have to be organised with great delicacy and skill, in order to avoid the stigma that, justly or unjustly, attaches to trusts and rings. The federated builders would no doubt endeavour to evolve a scheme whose fairness to all parties could never be called in question. Possibly such a scheme may never be materialised. But the Federation could be made the means of attempting it. What is perhaps even more important than definite action in the matter, is the tone that must inevitably result from the mere existence of the Federation—its benefits are moral as well as material. It creates an atmosphere in which the price-cutter is braced up to a higher sense of self-respect and an increased regard for his duty towards his neighbours.

A "Jolligists'" Jubilee.

"Let us go jolligising!" Charles Kingsley was wont to exclaim to his friends and pupils. The Geologists' Association, which, having been founded in 1858, has just attained and celebrated its jubilee, seems to lay some stress on this breezy view of the science, for Mr. W. Watts, presiding the other night at the annual meeting of the Association, declared that field excursions had been the chief end and aim of its existence. "They were its most useful form of activity, the index of its success, the occupation of its chief members, and its most important educational function." It would not be surprising to learn that among the 661 members that this peripatetic association can now boast, there are many architects. It must be at once instructive, healthful, and altogether delightful, to track, in congenial company, the Portland screw to its lonely lair, and to discover the sea-lily in situ, the limestone in its natural bed. The architect who prefers to remain prone in his own natural bed rather than to sally forth with kindred spirits while yet the dew is glistening on the short and scanty grass of the rolling downs will probably find that the museum in Jermyn Street will but increase his somnolence. The architect ought to know a little of everything, and more than a little of some things, among which it seems legitimate to include a knowledge of the rocks whence, in one form or another (even brick earth being, geologically speaking, a "rock"), his buildings are hewn; and when the acquirement of such useful information is compatible with invigorating excursions afield, nothing further need be said in commendation of the "jolligising" methods of this fifty-year-old Association.

The L.G.B. Report.

The average Government report is studiously cynical. A drily sarcastic tone, and a frigidly severe, not to say mean and narrow, estimate of human motives, form the staple of the style in which such documents are usually drafted. The thirty-seventh annual report of the Local Government Board (for 1907-8) which was issued last week, is fairly true to type. One section of the report comments on "the difficulty of curbing the extravagance of boards of guardians in their building operations," as if that extravagance, which has been brought into perhaps undue prominence by one or two notorious cases, were not amply set off by innumerable instances of well nigh incredible parsimony and penny-wise economy. "An architect," we are coolly informed, "is paid by commission, and there is, therefore, every inducement to him to make his plans as elaborate as possible." This need not be regarded as a covert insult to the profession! It does not condemn the architect. It simply insinuates that the foolish guardians tempt him, and that, being human, he is likely to make the most of the opportunities thus thrown in his way. Some men might. Others—and we would fain hope the vast majority—certainly would not barter their honour and self-respect for any glittering temptation that any board of guardians could hold out to them. That boards of guardians or other local authorities are in this respect inveterate sinners is suggested by the statement that "it seems that after the Local Government Board have sanctioned a certain loan in respect of particular plans, it has been the custom to make all sorts of additions without any further authorisation, and in this way huge bills have been run up to the profit of the architect and the contractors." Is it not within the power of the Board to surcharge or "cockertonise" such excesses of naughtiness? Or, alternatively, is it not the fact that in most cases of this sort the extras have been found to be perfectly necessary and legitimate, so that the L.G.B. could not reasonably interfere? The fact is that the average architect is not the coldly calculating person that the L.G.B. would have us suppose him to be. He cannot estimate to a nicety either his own chances of personal emolument or the probable cost of a building which, as it grows under his hands, develops needs that could not possibly have been foreseen except by simply superhuman prescience. That builders "lose a little on the contract in order to gain a lot on the extras" is a vulgar error, to which the Local Government Board should not have subscribed even by obscure innuendo; and to insinuate that, as a body, architects are not above inflating the cost of a public building in order to swell their commission, is grossly to malign a profession that, on the whole, notoriously pays too little attention to the business side of the argument; and it is to credit them with a degree of influence and a power of persuasion that would suffice to move mountains. But if the Local Government Board could invent and establish some equitable basis of remuneration that would render the architect immune from sinister attacks in its own Blue Books, it might possibly be in a position to save a few extras on the printing bill. And while it is in the reforming mood, it might enquire what proportion of the money allotted to municipal building is absorbed in obtaining Parliamentary powers and meeting Local Government Board requirements, wise and otherwise.

Pulex Irritans.

After all, it would seem that there is some semblance of finality of liability under the Workmen's Compensation Act. The law draws the line at fleabites. At Cardiff, a carpenter sued his employers for compensation "in respect of a bite of a flea." The "accident" was thus reported to the employers:—"Independent Order of Rechabites.—I am sorry to inform you I am unable to follow my work to-day. The fleabite I received last week, and showed you on Friday, has resulted in the poisoning of my leg." It was suggested that the ferocious flea was allowed to be at large at a place in Cardiff where the carpenter was putting in a shop front; and being carelessly left unchained and unmuzzled, it flew at the unfortunate carpenter, probably without so much as a premonitory growl, and fastened its horrid fangs in his leg, inflicting on him a wound that one of the witnesses described as being "more like the bite of a bulldog." This finely developed flea must have been reared on Mr. H. G. Wells's "Food of the Gods," on which nourishment field-mice grew to the dimensions of kangaroos; or it must have been big enough to justify the description of the deathless distich "These fleas have other fleas to bite 'em. And so along, *ad infinitum*." The great question that the Court had to determine was the ownership of this colossal *pulex*. Upon this point the evidence was so unsatisfactory—the flea evidently not having worn a collar bearing its owner's name and address—that the judge had no alternative but to find for the respondents. Whether the flea is still running loose, or whether it has been shot in its tracks, is not reported. The decision is no doubt important to the trade, for, if the finding had been otherwise, the risks, especially in certain branches of the trade, must become absolutely paralysing. It is credibly reported, for instance, that "on, in, or about the premises" of the simple poor, this kind of vicious pet, in several varieties, and in assorted sizes, doth greatly abound, and the employer called upon to pay contingent damages every time they bite would need a pretty substantial reserve fund, for he would find it very difficult to persuade any insurance corporation to take over the appalling risk of such ferocious fleas as those that flourish Cardiff way.

PLANNING OF SECONDARY SCHOOLS.*

By H. T. Buckland.

In two blocks slightly better lighting and probably better disposition of playgrounds are possible, and one central hall may be side-lighted. In three blocks the same remarks apply, and side-lighted central halls become possible in all departments, and a natural system of ventilation is facilitated.

Secondary Schools.

Government aid for secondary education has only been available since the passing of the Act of 1902; until that time the higher grade school was the only continuation of State-aided general education, and the buildings provided for this higher-grade education were modelled upon those for elementary education; it is, therefore, not surprising to find that the earlier secondary schools erected after the passing of the Act of 1902 bear all the marked characteristics of the elementary school in their planning.

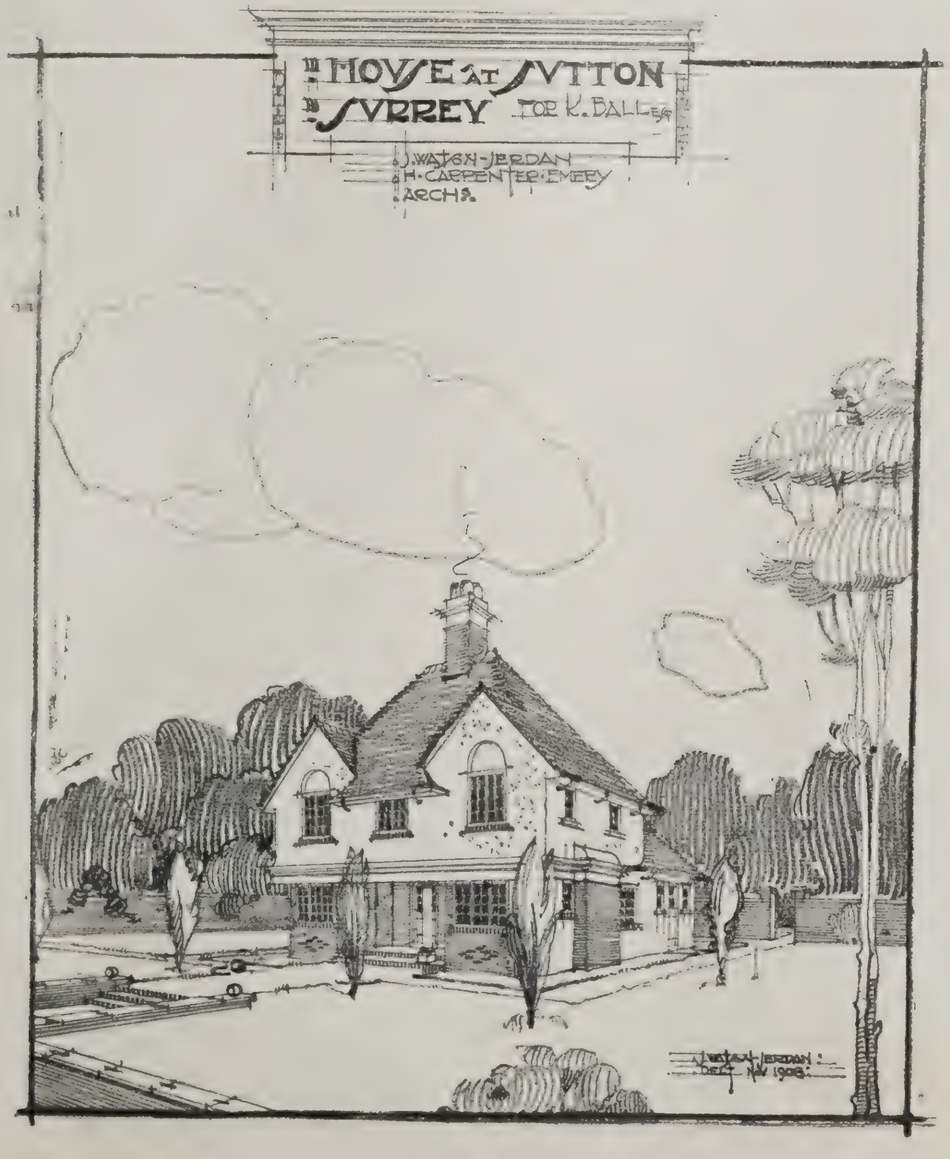
The *central* hall still holds its own, and the Board of Education appears to regard it as the best type of plan, as witness a general note in "Principles to be Observed in Designing and Fitting-up New Buildings for Use as Secondary Schools," which reads as follows:—"The rooms should be grouped compactly and conveniently in order to secure easy and effective supervision and economy in working and maintenance. Generally speaking, in the case of schools where the number of scholars is considerable, this result can most satisfactorily be secured by placing the class-rooms on three sides of and opening from a central hall."

Assembly Hall.

Differences of opinion upon secondary school planning will, I think, be found mainly on this question, and a marked tendency may be perceived to provide a hall which is not a passage-room to the various class-rooms, corridors, etc. Such an arrangement affords a room not only for general assembly, but one which may be also used (free from interruption) for various purposes, such as examinations, singing, drawing (if there is no art room), and any assembly of a portion of the school without disturbing the remainder, for any of which purposes a central hall is not so convenient. On the other hand, a central hall is, before all things, adapted for good supervision, but is this of extreme importance in a school with an adequate and thoroughly qualified staff? Expressions of opinion from head masters and mistresses certainly incline me to think not. If, then, a hall is required to be used for all or any of the purposes I have just mentioned, a *central* hall does not appear to be the best arrangement which could be adopted; if, on the other hand, supervision of teachers and students is of paramount importance, then the claims of the *central* hall plan cannot be disputed.

The Board of Education, as I have already pointed out, is very definite upon this question, and in addition to the clause I have already quoted, goes on to say: "Where more than one floor is necessary, the upper rooms can be entered from a gallery which should be in full view of the hall."

I know of elementary schools planned upon these lines which have been found noisy and inconvenient; possibly the better discipline of a secondary school would prevent the former; if so, might it not also ensure satisfactory behaviour without such elaborate provision for supervision? Fortunately, the Board of Education, while offering guidance, do not insist upon an abject submission to such guidance, and express their willingness to consider other suggestions in the following words:—"The Board recognise that, owing to the wide difference between the various grades and kinds of secondary schools, and pupil teachers' centres, it is undesirable to attempt to lay down any hard and fast rules as to the actual method of planning to be adopted except on points of fundamental importance."



As in the case of elementary schools, I will now proceed to discuss the points upon which an architect will need to be informed in planning a *secondary* school.

Points in Planning Secondary Schools.

1. With regard to the number of children to be accommodated, the Board of Education makes no suggestion on this point; personally, I know of no recent secondary school which accommodates more than 400 scholars in one department, and from 200 to 300 appears to be a very usual number.

2. In what number of departments is a school to be planned? As infants have no longer to be considered (except that a Kindergarten is sometimes provided in connection with a girls' school), only two remain. Curiously enough, the Board of Education offers no guidance as to whether a school shall be in two departments—a mixed school, or entirely separate schools for boys and girls. As both are being built, there seems no doubt either that differences of opinion exist, or that motives of economy have probably borne their share in a decision, as in the case of elementary schools.

An arrangement which appears to be a sensible one on both educational and economical grounds (at any rate, so far as the cost of buildings is concerned), is to plan a school for boys and girls with hall and class-rooms separate for each, but with certain rooms for special instruction—such as chemical laboratories, lecture rooms, art rooms, gymnasium, etc., in common. It will be found that a time-table can be arranged which will permit of these rooms being used in turn by boys and girls, and economy is effected by not having to provide them in duplicate.

The *merit* of "mixed" or "not mixed" education in secondary schools, I think, we may conveniently leave to educationists to settle.

3. Upon the question of the number to be accommodated in the various class-rooms, we find very clear instructions in the Board of Education Rules, and I will venture to quote the section which deals with it in full:—"In every school there must be class-rooms at the rate of four for every 100 scholars. There must be in the class-rooms, as distinct from the laboratories and other rooms, sufficient accommodation for the whole number of the scholars for whom the school is intended to provide. A lecture-room, however, if suitable for class teaching may be counted as a class-room for not more than thirty, or less than fifteen scholars. Class-rooms should be fitted with single desks, having a gangway of not less than 18in. between the rows and between the desks and wall on each side, 1ft. between the last row of desks and the wall, and a clear space extending the full width of the room of not less than 7ft. 6in. between the front row of desks and the wall, for the teacher. The desks may be reckoned as occupying a space of about 3ft. by 2ft. in order to provide the requisite distance between the front of one and the back of that next in front of it."

Floor Area.

To provide for this a floor area of from 17 sq. ft. to 18 sq. ft. per head will be required, according to the size of the class. In cases where it is found difficult to provide this amount, the Board will be prepared to accept a minimum allowance of 16 sq. ft. per head provided that the arrangement can be shown to be satisfactory. In this case the desks should be placed closer together in pairs, with a gangway of not less than 2ft. between the double rows of desks.

---

*Extracts from a paper read by Mr. Herbert T. Buckland, before the Architectural Association, on February 5th. The first portion of the paper, dealing mainly with elementary schools, was given in our issue of February 10th, p. 113.

Where fireplaces are provided they should be placed in the outer corner of the room in order to avoid interference with the master's platform and blackboard.

Stepped seating should not be used."

Intimately bearing upon this and the total acommodation of a school, is an introductory note, which reads as follows:—

"It is important to remember that as the actual numbers in a class can seldom be made to correspond closely with the various sizes of rooms provided, the nominal accommodation as shown by the plans should exceed the number for which the school is intended to provide."

Accommodation, Nominal and Actual.

This means, of course, that, as a general rule, a school which has nominal accommodation in class-rooms for, say, 225, will only be considered as providing accommodation for, say, 200 children.

The charming inconsistency of the promoters of schools' competitions is very noticeable with regard to this point; invariably the question goes to them as to whether the cost of the building is to be based upon the nominal accommodation shown upon the plans or upon the number for which the school is intended to provide. It is scarcely necessary for me to say that the invariable reply is the latter. Now, if the price allowed per head is £40 (which, by the way, it seldom is, and more often should be) the difference amounts to £1,000, and it is entirely absurd to ask for the extra accommodation without expecting to provide for it in the cost.

Number of Floors.

As to the number of floors, the rules offer no guidance except in so far as they assume that more than one floor may be necessary in a clause I have already quoted in connection with the question of a central hall. It reads as follows:—

"Where more than one floor is necessary, the upper rooms can be entered from a gallery, etc., etc." I think there is little doubt that a two-story building is the most convenient. I am not acquainted with one consisting of a ground floor only, but there are many of more than two stories. If the desirability of more than one floor is admitted, what, then, is the best apportionment of the various rooms to the separate floors? Personally I consider it important to have all class-rooms on the same floor as the hall, and this preferably the ground floor.

Laboratories, lecture rooms, art studio, etc., all rooms which are occupied by each class in turn for a portion of the day, can be placed conveniently on the upper floor.

The general class-room accommodation in a secondary school is so similar to that of an elementary school, that I need not spend time in discussing it, but the following comparative areas, as required by the Board of Education, may be of interest:—

In assembly rooms of *secondary schools* at least 6 sq. ft. per scholar, and if the school is for less than 150, 8 sq. ft.

In *elementary schools* not more than 4 sq. ft. per child is allowed, and 3½ sq. ft. is considered sufficient.

In class-rooms of secondary schools 17 sq. ft. or 18 sq. ft. per head is *required*; while a minimum of 16 sq. ft. may be accepted. In elementary schools 9 sq. ft. is required for infants, and 10 sq. ft. for other children. I admit I find these differences somewhat puzzling; the schools are both for the same children (in the one case when they have, some of them, grown older); and the question naturally presents itself: Is the one too large or the other too small? In a small elementary school with a department for only 200, I think the latter, as even on the 4 sq. ft. basis the hall will only be 800 ft. in area. Now the children in an elementary school have to use this hall for drill in wet weather, and a space of 40 ft. by 20 ft. to drill in is not found entirely satisfactory.

If a secondary school has a gymnasium, the assembly hall is not used for drilling; nevertheless, it has twice the area of that in the elementary school.

With a view of taking more than one class in a room for certain lessons, the provision of a lecture-room is desirable; this the Rules state should accommodate not less than thirty scholars, and may be large enough to hold more; it should be constructed, as far as possible, on the principle of a theatre, with rising seats. There must be a floor space of not less than 14 sq. ft. per scholar for the first thirty scholars, and 12 sq. ft. for each scholar above that number. This room, as previously stated in the clause relating to classrooms, "if suitable for class teaching, may be counted as a class-room for not more than thirty scholars."

Rooms for Special Instruction.

It is not within the scope of a paper like this to go into details with regard to the various rooms which are needed for what one might call special instruction. I shall, therefore, only attempt to touch upon points which seem to present matter for discussion. Upon the subject of laboratories the rules say: "A physical laboratory should be free from vibration, and for that purpose placed on the ground floor, where possible, and should be capable of being darkened." This instruction with reference to the position of the physical laboratory is fairly definite, and has severely exercised the mind of many a beginner in the planning of schools; but is it of vast importance? If so, why are so many physical laboratories placed on an upper floor; as a matter of fact, the teaching of physics in a secondary school is not of such an advanced character as to demand the extreme freedom from vibration which can only be secured on a ground floor. On the other hand, a point very lightly touched upon in the Rules is the balance-room; these are the words:—"If there is no balance-room a separate place in the laboratory should be assigned for balances." It is, I think, very generally agreed that a balance-room is essential, as it is important the balances should be kept free from the chemical fumes. One of the advantages to be gained by placing the various rooms for special instruction on the upper floor is the improved lighting which can usually be achieved; it is scarcely possible to get too much light in laboratories, and very frequently if these rooms are on an upper floor, light can be obtained from more than one side by judicious planning. If good light is essential in laboratories, it is more so in an art room. The chief function of an art room, if the rules of the board are to be interpreted literally, is to defeat the object of its own teaching by utterly spoiling the architectural design of the building in which it is placed. In speaking of the advanced art room, this is what will be found:—"This room should be lighted from the north side by a single large window, square at the top to give as much light as possible."

Concerning Windows.

If one is lucky in the matter of aspect, one may be able to get this single large window square at the top, facing an area, or concealed from view by roofs; but if the aspect is not favourable, and one of your important elevations faces north, you will need the skill of a Michael Angelo to make the type of window an art mistress sighs for harmonise with the scale of your building.

And is this north light in such abundance the one and only light which will enable the scholars in a secondary school to benefit by the teaching given for an average of eighty minutes per class per week? I put the following question to the headmaster of one of the first art schools in the Kingdom: "From which quarter would you prefer the light of an art room?" His reply was: "I don't much care from what quarter it comes so long as I can get plenty of it, and still have enough if I have to shut out some when the sun gets in. I prefer some sun, as I may need a class to study the effects of sunshine on various objects; flowers and foliage under sunshine have new revelations for us."

A north light for a studio painter of large pictures is, I believe a *sine qua non*, but a secondary school is not dealing with such, and I question whether sacrifices in the design of a building should be demanded where the need does not really exist. For all practical purposes, in my opinion, a well-lighted classroom with ordinary windows, possibly from one side and an end, or two sides, will serve admirably for the kind of art teaching which is given in a secondary school.

Dining Halls and Kitchen.

A point with regard to dining-halls and the kitchens in connection with them, which is, perhaps, worthy of note, is the desirability of providing a separate entrance for tradespeople; this will, generally, I think, be found a great convenience. A library in a secondary school, although not insisted upon by the board, is certainly a very desirable attribute. As far more time is spent by teachers in secondary schools in preparation work, correcting papers, etc., than is the case in elementary schools, larger and more comfortable rooms for their use will need to be provided, and the headmaster will require a really spacious room, as books and papers with which he has to deal will occupy a lot of room.

In cloak-rooms twice the length of hanging space is required as compared with elementary schools, and in neither should lavatory basins be placed in the cloak-room.

Area of Windows.

A point which will materially influence the architectural treatment of the elevations is the large area of window lighting required by the Rules, which state that "The area of window glass should approximate to one-fifth the area of the floor space in rooms used for teaching, and in other rooms not less than one-eighth." I doubt if so much is often given or really necessary. I need hardly mention that light is required to come to the left-hand side of the scholars. A point of importance is emphasised in the following clause:—"Unless the top of the windows be more than 12ft. above the floor, the plan should show no space more than 20ft. from the window wall in any room used for teaching."

Sanitary Accommodation.

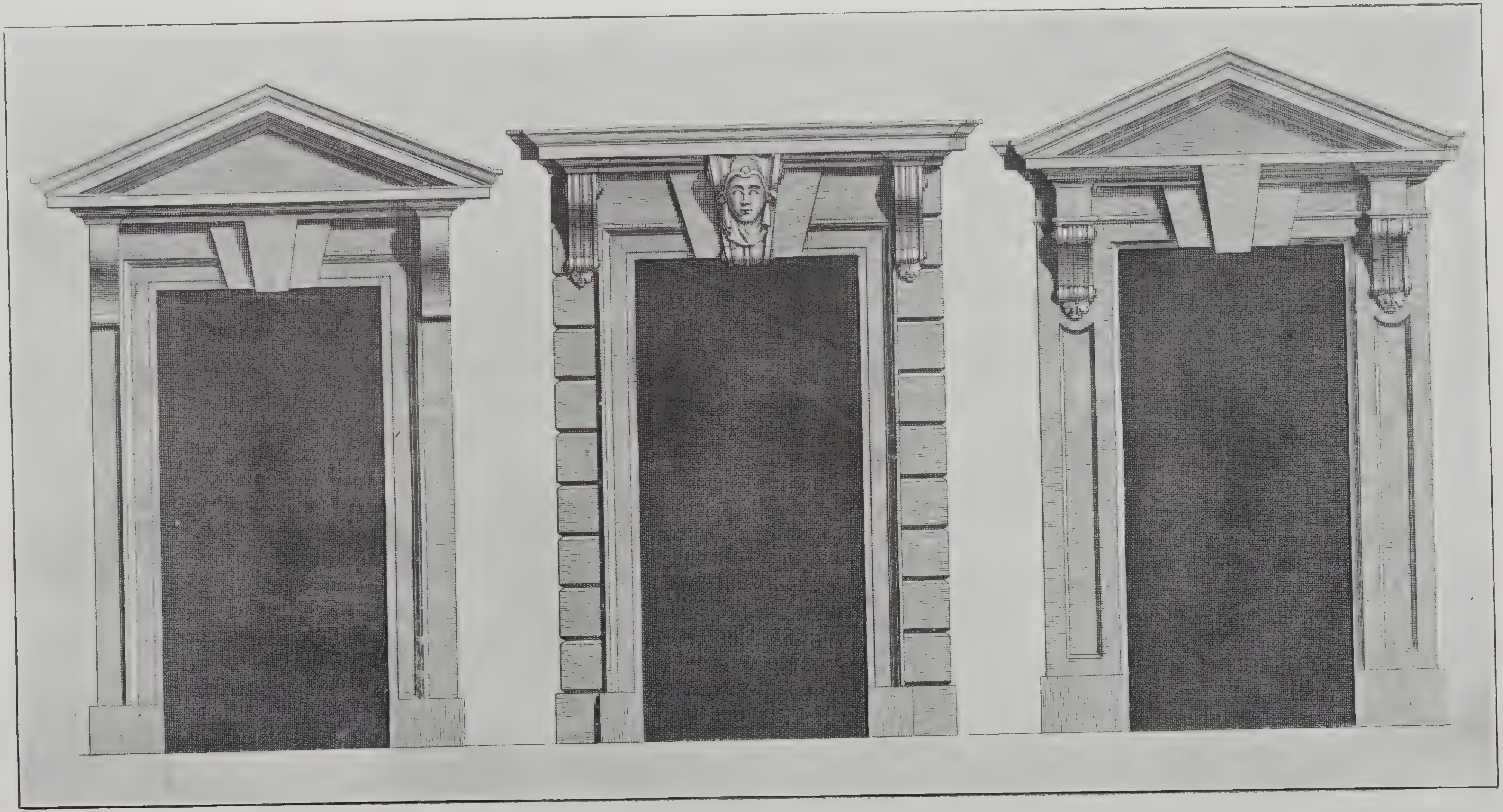
With regard to sanitary accommodation, it is suggested that the girls' offices should be in the main building, and those for boys completely disconnected and at a short distance from the school. In a girls' school some headmistresses advocate the distribution of a small number of water-closets on the various floors in addition to a main block of offices. Automatic flushing for closets is undesirable, and each closet should be fitted with its own apparatus. In elementary schools an automatic flushing system is almost universally, I think, adopted, although I understand that many educationists advocate the employment of an independent flushing apparatus, with a view of inculcating habits of decency from the earliest moment. In one case I know of where efforts in this direction were made in an elementary school, the result was not satisfactory, and an automatic system had ultimately to be installed.

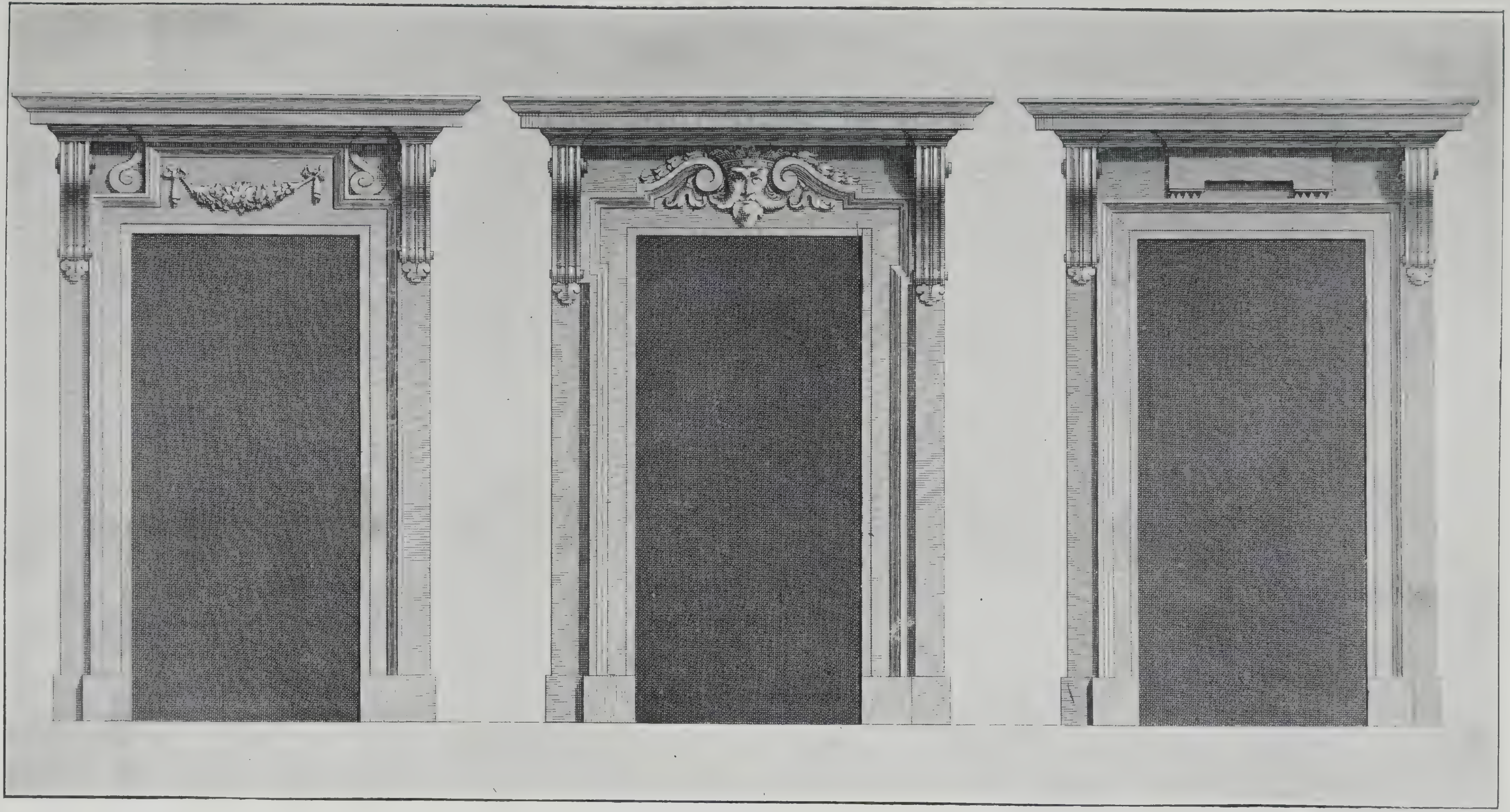
(*To be concluded.*)

Our Plate.

We give this week another plate, the last but one, of details by James Gibbs. The subject is doorways, and it is almost needless to say that the dignity and refinement to be expected from the architect of St. Mary-le-Strand, are here exemplified in a remarkable degree.

Supplement to THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER, *Wednesday, February 7th, 1900*





SOME DESIGNS FOR DOORS BY JAMES GIBBS.

BLACKPOOL CENTRAL LIBRARY COMPETITION.

All the designs submitted in the above competition—about 140—have been on exhibition at the Winter Gardens Pavilion, Blackpool.

Judging by the large number of people seen inspecting the drawings, this competition must have created unusual local interest. The majority of the designs show a high standard of work in plan, design, and draughtsmanship. It has, therefore, been a difficult task for the assessor, Mr. G. H. Willoughby, of Manchester, to select the premiated plans. The general opinion regarding the award is that it is quite satisfactory to all concerned.

The following is the assessor's report, which shows the points he has considered most in making his adjudication:—

ASSESSOR'S REPORT, NEW CARNEGIE LIBRARY.

"Gentlemen,—Acting on your instructions, I have made a most careful examination of the whole of the drawings submitted for the above important public buildings, and herewith have pleasure in laying before you my adjudication on same.

"Before doing so, I feel called upon to emphasise the remarkable response the architectural profession has shown to your invitation—many able and carefully thought out schemes having been sent in; consequently the difficulty of arriving at an equitable assessment has been greatly increased.

"Every design has received my most careful study and investigation, and as a result of my anxious deliberations, extending over many days, I have no hesitation in awarding the set of drawings numbered 41 the honourable position of first place.

"The author of this design has shown conspicuous ability in successfully dealing with the problem, both from the points of arrangement, construction, and design. The scheme is an excellent one, and admirably adapted to the several purposes of your intended structure as set forth in your 'Particulars, instructions, and conditions of competition.'

"For a practical working library of the character you contemplate erecting, and providing complete oversight and control to every department, with economy of administration by a limited staff, the general arrangements of the premier design would be exceedingly difficult to improve upon.

"The author has thoroughly mastered the essential points to be striven for in successfully planning a town library, and the strength and refinement shown in the internal as well as external treatment clearly indicate he is master of his craft.

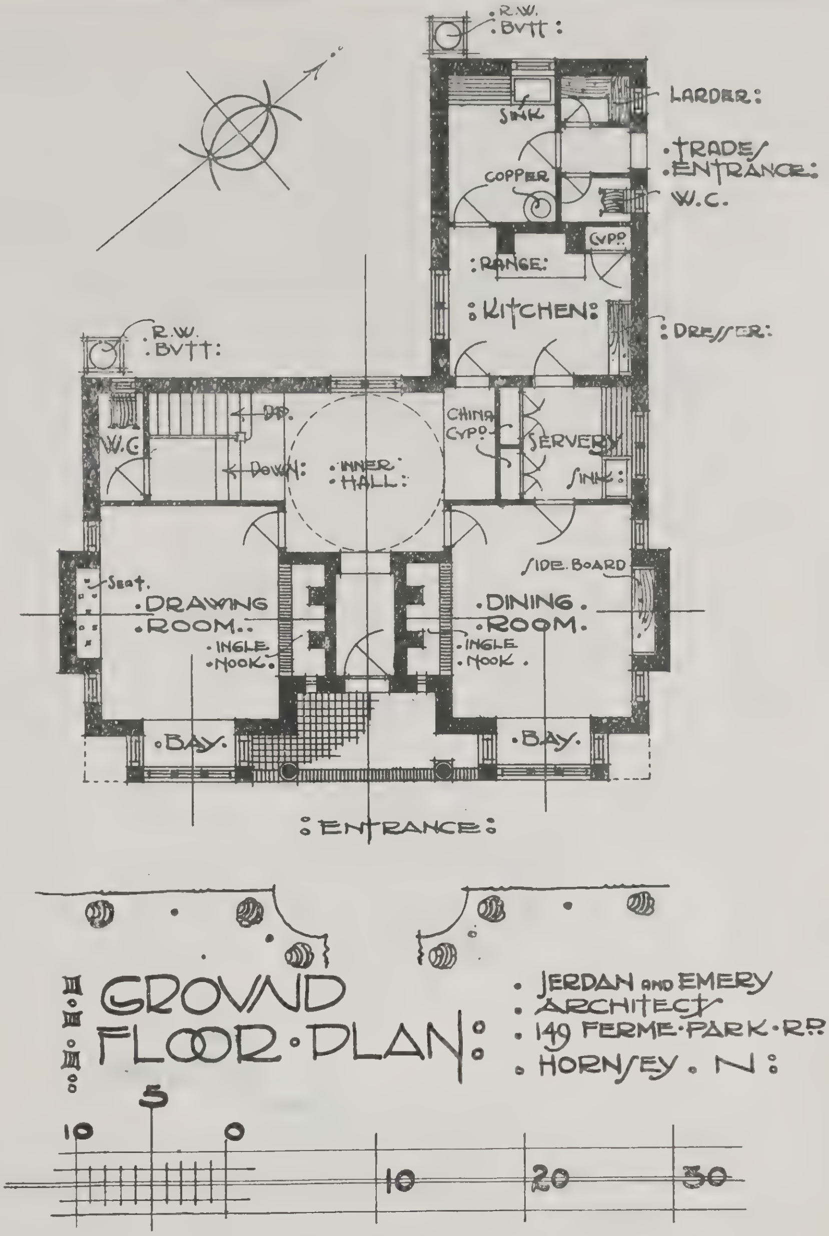
"The architectural conception of the elevations is scholarly, dignified, simple, and appropriate for execution in brick and stone. Monumental in character, a symmetrical facade is obtained to each street, flanking the main entrance doorway, which is wisely placed (as suggested by you) at the corner of same.

"The doorway is made the principal feature of the design, being marked by a low dome, surmounting a handsome colonnade of polished red Aberdeen granite.

"Ample provision for efficient light and ventilation has been carefully made—also the utilising of all roofing to its utmost capacity should be noted.

"Taken as a whole, the premier scheme (No. 41) is an economical one. The prices per foot upon which its author has moneyed out the cubical contents ought to be adequate to erect the building (as designed) in a satisfactory manner, and in accordance with your particulars and instructions, due care being exercised in the detailing generally.

"Respecting my decision as to the awarding of the second and third premiums, I experience a grave difficulty in advising you. Although many good designs, carefully conceived and conscientiously developed, have been sent in, yet in every scheme certain blemishes and points of weakness are to be found when compared with No. 41.



HOUSE AT SUTTON.

"There are, however, five designs which I have finally chosen, after a most exhaustive scrutiny, viz., Nos. 47, 38, 62, 10, and 104, each of which contains certain merit of its own, either in arrangement or design, or both, coupled with a sincere and earnest effort to solve the problem faithfully. To each of these I have felt called upon to award the commendable position of 'equal second.' Whilst doing so, there are several most able designs (including Nos. 133 and 117) I have been compelled to disregard consequent on their excessive cubical contents.

"With your definite instructions as to cost clearly before me, viz., Paragraph No 3, 'The total estimated cost of the building must not under any circumstances exceed the sum of £12,500, and all designs submitted must be prepared on this basis,' I had no alternative but reluctantly to pass over same.

"The profession's remarkable response to your invitation, 140 designs), which at the lowest estimate I compute have incurred an expenditure of £3,500 to produce, emboldens me, as your assessor, respectfully to suggest that, under such exceptional circumstances, your Council favourably consider disbursing the whole of the premium money, viz., 100 guineas, equally among the authors of the five designs next in order of merit to the premier one, whose author, I trust, will be appointed architect for the work.

"It would be a generous act on behalf of your Council, and some return to the competing architects for the enormous amount of labour and money fruitlessly expended by them. My adjudication, therefore, is:—

"First—No. 41, to be appointed architect for the work on the terms agreed.

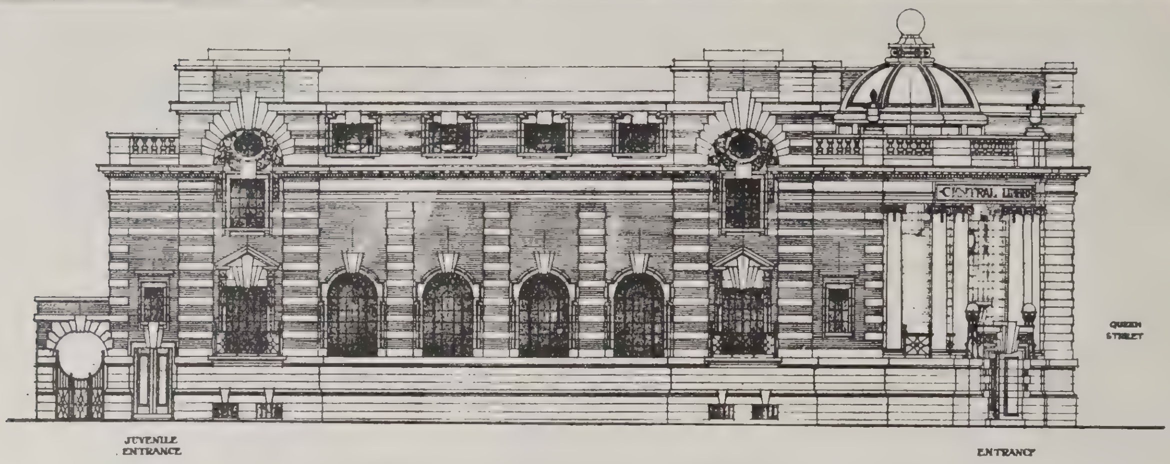
"Equal second—Nos. 47, 38, 62, 10, and 104, each to have a premium of 20 guineas.

"Nos. 60, 128, 103, 83, 18, 110, 21, 36, and 120, I consider are all worthy of 'honourable mention.'

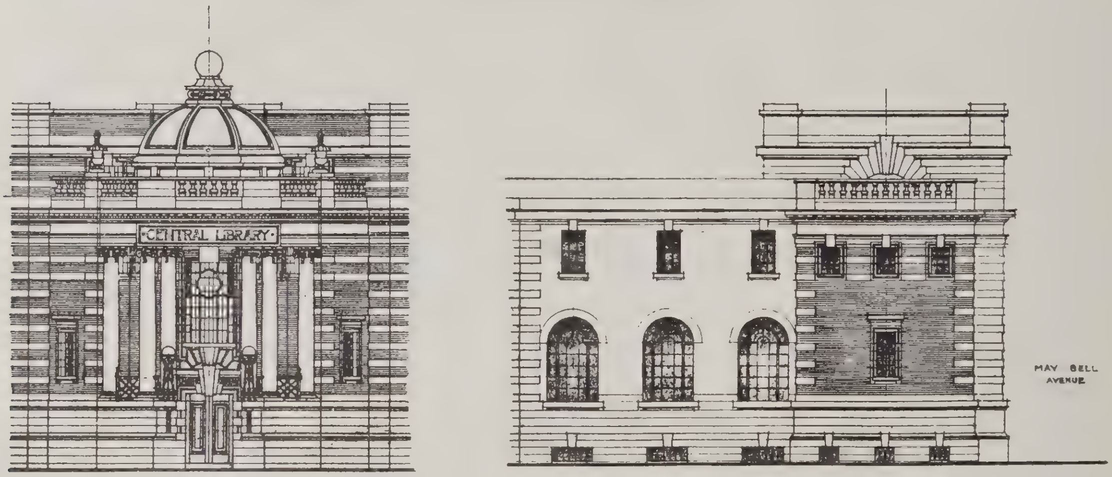
"I can only affirm that should you Council accept my awards and adopt scheme No. 41 for examination, in my judgment they will secure the best design submitted, and one that most fully and adequately embodies their requirements—taken as a whole.

"Remembering the importance of this competition to the profession generally, and that doubtless schemes have been prepared by architects practising in all parts of the Kingdom, I would earnestly ask the Council to arrange for the whole of the designs to be publicly exhibited for at least one full week. This would give every competitor the opportunity of personally inspecting same, as well as perusing also a copy of my report, upon which the adjudication has been made.

"In conclusion, I desire to express my sincere thanks to his Worship the Mayor, the Town Clerk, and the Borough Engineer, for the admirable arrangements made to assist me in fulfilling my difficult task, also for the absolute privacy and entire immunity from any interference or distraction I en-

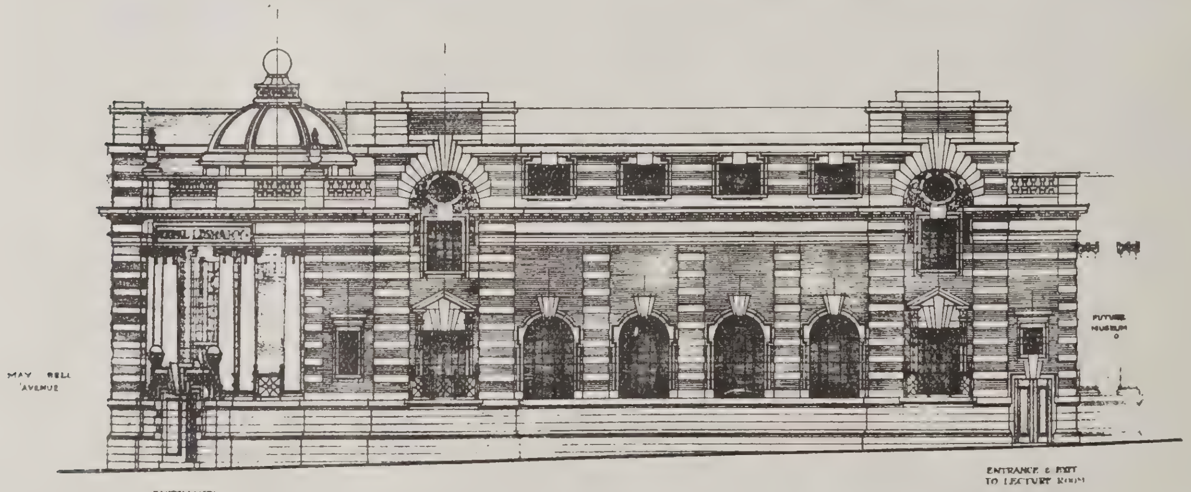


ELEVATION TO MAY BELL AVENUE



ELEVATION OF ENTRANCE

NORTH ELEVATION



ELEVATION TO QUEEN STREET

BLACKPOOL CENTRAL LIBRARY COMPETITION: DESIGN PLACED FIRST. ALEXANDER CULLEN, LOCHHEAD, AND BROWN, ARCHITECTS.

joyed throughout my somewhat lengthy examination.—Your obedient servant,

"GEO. H. WILLOUGHBY.

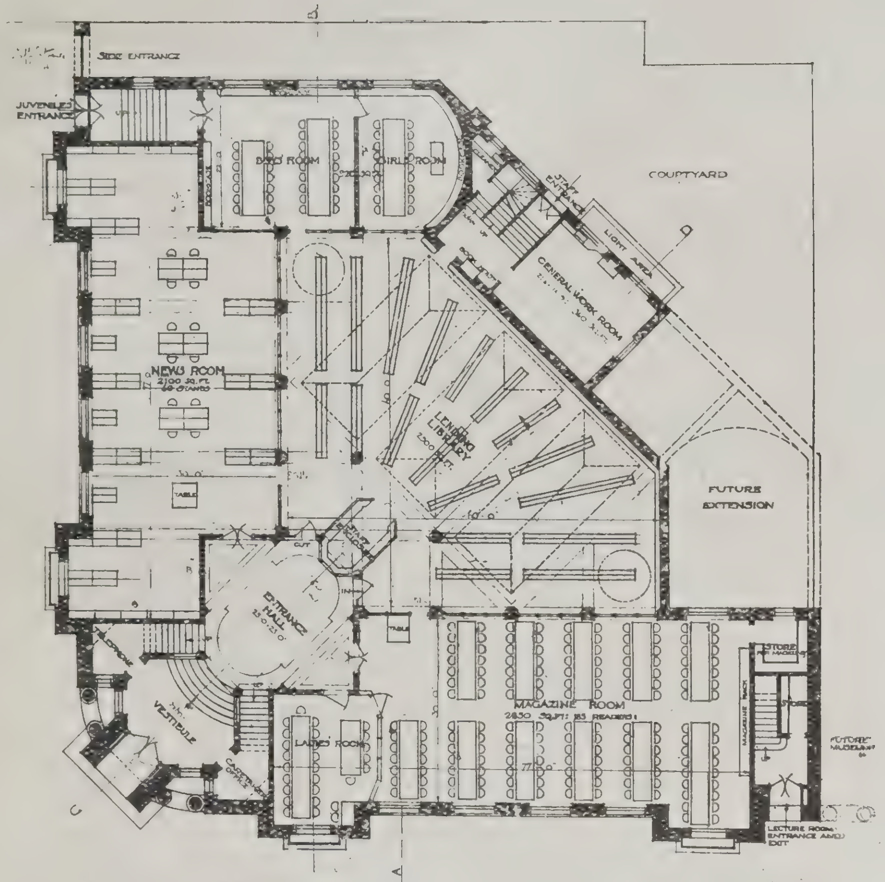
"Parr's Bank Chambers, Manchester,
"February 1st."

Design Placed First.

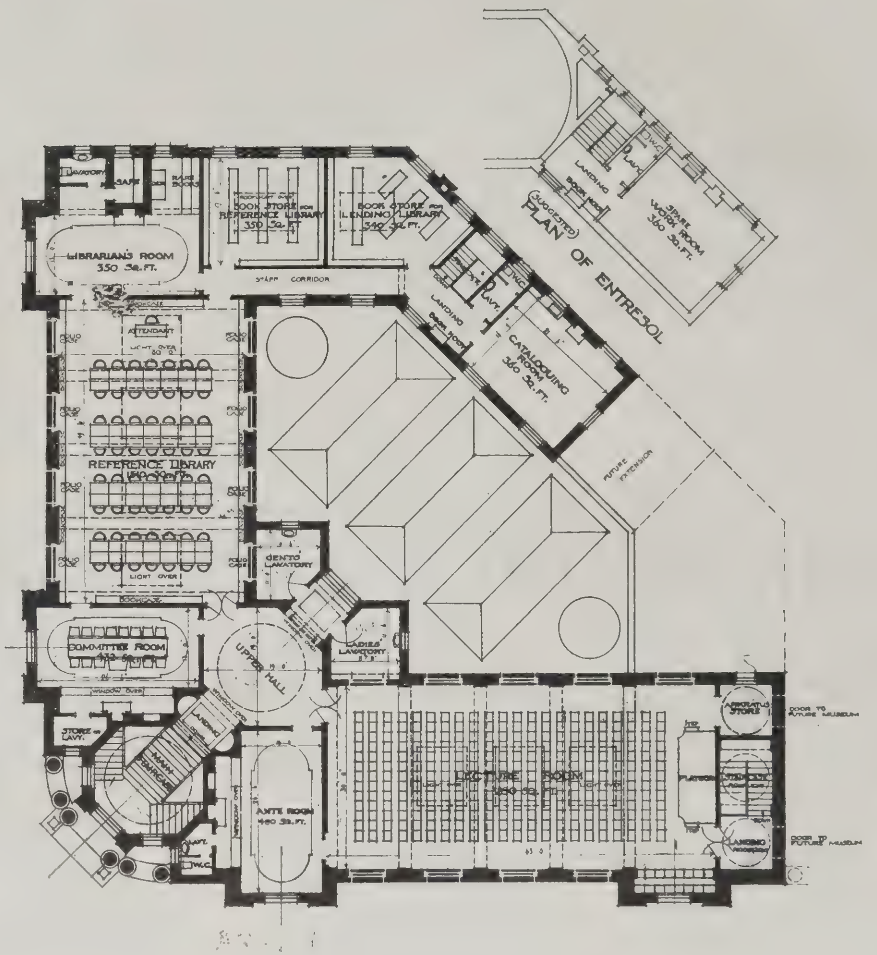
This position has been awarded to the scheme of Messrs. Alex. Cullen, Lochhead, and Brown, Brandon Chambers, Hamilton, near Glasgow. At a first glance this set of plans appears most successful, but on closer examination it appears to the writer that there are a few details which should receive further consideration before the working drawings are prepared.

Starting with the ground plan, it seems to the writer that, in following the main stairs from the lower to the upper floor, the head room, and the lighting might be improved. To light the entrance hall by means of glazed screens does not realise one's ideal. The news and magazine rooms are of peculiar shape, and there are other rooms of which the shape could be improved. No cross-ventilation is shown for the large public rooms. The back portions of the magazine, news, and juvenile rooms receive only borrowed light from the top lights of the lending library. Entrance to the girls' room can only be obtained by passing through the boys' portion of the juvenile reading room. Separate entrances were asked for. All the reading tables are away from the windows, and placed at the back, a low book-case and passage-way occupying the valuable window light. The traffic between these two rooms, and juveniles' examining books, would seriously interfere with the light and comfort of the readers. The book-lifts do not deliver directly into the lending library, being separated from the latter by a staff door. The arrangement and position given to the staff conveniences in the basement could easily be improved upon.

On the first floor the plan looks compact, but some of the smaller rooms are not happily placed. The ante-room is at the entrance end of the lecture room. The

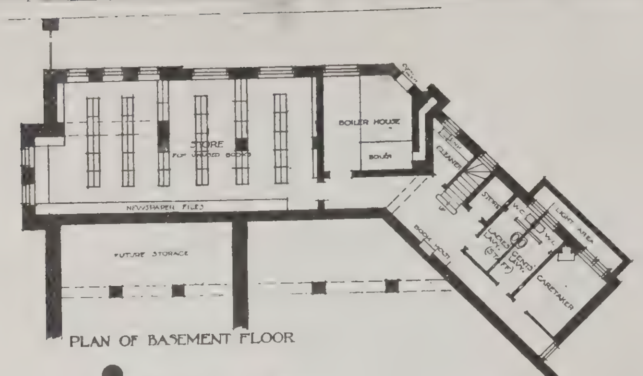


PLAN OF GROUND FLOOR

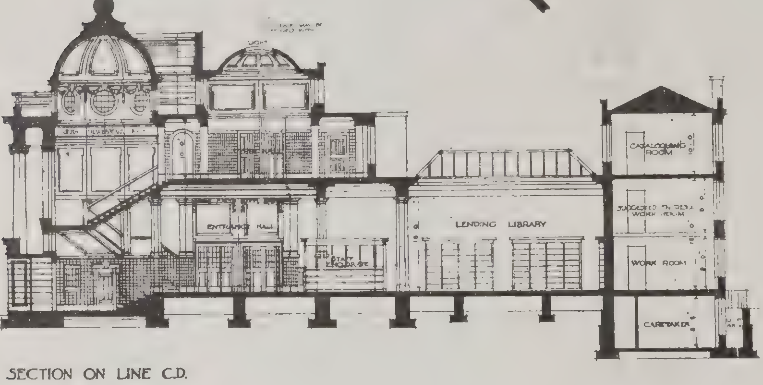


PLAN OF UPPER FLOOR

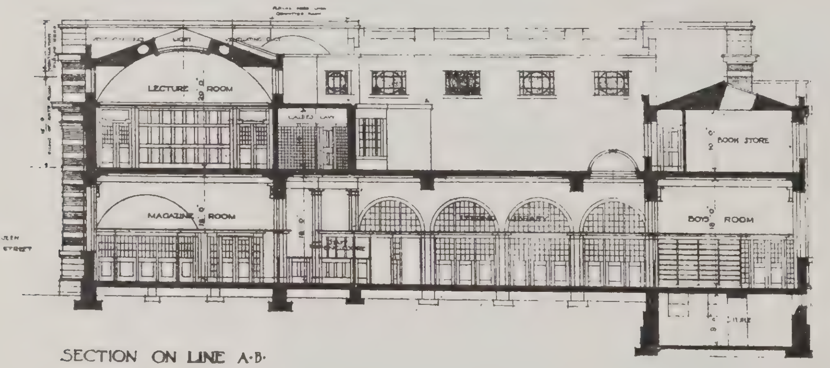
BLACKPOOL CENTRAL LIBRARY COMPETITION: DESIGN PLACED FIRST. ALEXANDER CULLEN, LOCHHEAD AND BROWN, ARCHITECTS.



PLAN OF BASEMENT FLOOR



SECTION ON LINE C.D.



SECTION ON LINE A-B-

BLACKPOOL CENTRAL LIBRARY COMPETITION: DESIGN PLACED FIRST.
ALEXANDER CULLEN, LOCHHEAD AND BROWN, ARCHITECTS.

upper floor crush hall is too small for 350 people to crowd out at the closing hour. Both the doors to men's and women's lavatories are on the opposite side of an anteroom, and face one another—this should be re-arranged. Why no w.c. or cloak-room space and counter, seeing these were asked for? The position of committee-room is too far from the librarian's room. Reference-book storage could have been near the reference library for the use of the public; as shown, it is entered off a private corridor, with two doors between the rooms. Again, the book lifts deliver at a distance from the store and reference library. We note four sets of conveniences for the use of the staff—this is lavish for a staff of eight persons—those in the basement are useless, and although stated in the conditions, ought never to have been placed there. The elevations form the best part of this design, and probably they have influenced the award to a considerable extent. An improvement could be made by emphasising the entrance doorway and treating it boldly. The stopping of the main cornice at the end features is not quite happy, and the wall pilasters end abruptly against the entablature. Owing to the adjoining gables and high end features, the corner dome appears squat, and could be raised higher with advantage. The columns supporting cornice will be in red granite, and the internal woodwork to the principal rooms in Austrian oak. Taking the great amount of stone-work in the elevations, also the height of the rooms, and the cubical contents—priced at 5d. and 7d.—we know from experience that the cost of recently-erected libraries is higher per cube foot than the foregoing, for plainer buildings and less expensive materials. The contents of this design amount to 418,369 cube feet, wi 18,369 taken at 5d. and the larger cube at 7d. per foot. The total cost of £12,499 includes the sum of £450 for parapet walls, gates, and railings.

Other Premiated Designs.

Five designs have been awarded second position, and receive equal premiums. The first scheme mentioned is that of Messrs. S. B. Russell and T. E. Cooper, 11, Gray's Inn Square, W.C. The plan of the lending library is a trifle original, but not good for supervision—seeing that the attendant is centrally placed in one room only. The second scheme mentioned was the work of Messrs. David Thomson and Christopher Bristow, 7, Cranwich Road, Stamford Hill, London. The writer does not care for this design. A more successful set was that of Messrs. Cooper and Slater, 13, Richmond Terrace, Blackburn, though the plans were open to improvement in detail, while the elevations were the least praiseworthy part of the design. Mr. Charles H. Potter, 20, Cross Street, Manchester, submitted a fine set of plans, coupled to interesting elevations, worth the position given this scheme. Another set that was well drawn, but was rather unsatisfactory as to the detail requirements of a library, was submitted by Mr. H. R. Gardner, Reigate Road, Leatherhead.

Other Designs.

"Honourable Mention" was awarded to a large number of designs, the following architects being specially mentioned:—Messrs. H. Norton, of London; Briggs, Wolstenhome and Thornley, of Blackburn; Edmund Cratney, of Wallsend-on-Tyne; Hatchard, Smith and Son, of London; Walter Hanstock and Son, of Batley; Myrtle Smith, of Chelsea; F. E. and A. Milne, Glasgow; H. Lord, Manchester.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Feb. 20	GUILDFORD. Footbridge over the River Wey. Designs are invited for a light footbridge in oak or other materials. Particulars from C. G. Mason, C.E., Tuns Gate, Guildford. Designs to be sent to W. Shawcross, Hon. Sec., 108, High Street, Guildford.
Feb. 20.	PENCLAWDD (WALES). Chapel. Plans are invited for a new chapel to contain 800 seatings. Approximate cost of chapel, including heating and acetylene lighting apparatus, £3,000. Premium—five guineas to the architect whose plan *the Committee may select*. Plans to be deposited with John Rees, Secretary, Penian, Penclawdd, S.O.
Mar. 1.	TORRINGTON (DEVON). Memorial Cross. The Committee of the Rolle Memorial invite designs for a memorial cross (preferably of granite), to be erected in the churchyard, Torrington. Cost, inclusive of erection, &c., not to exceed £100. Premium £2 2s. for the selected design, but no other charge or expense. Particulars from George M. Doe, Town Clerk, to whom designs are to be sent.
Mar. 8.	*PONTARDAWE (WALES). Offices for the Guardians, in Holly Street. Premium £10 10s. The premium is offered by the Guardians "for plans with abridged specification, *which in their judgment* are best suited." Particulars and conditions from C. B. Jenkins, Clerk, Herbert Chambers, Pontardawe, S.O., Glamorganshire.
Mar. 17	†NEW OFFICES FOR THE STANLEY U.D.C., DURHAM. Cost £3.500. Premiums £30, £20 and £10. Conditions, etc., to be obtained from J. G. Ridley, Clerk to the Council. Stanley S.O., Co. Durham.
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days.
No date.	BLACKBURN. The Blackburn Small Holdings and Allotments Committee have decided to invite architects and surveyors in the Borough to submit competitive plans for the laying-out of the estate at Oswaldtwistle, recently purchased for small holdings. Premiums of £25, £10, and £5 are offered.

*We are advised by Mr. Jenkins that the supply of particulars and sketch plans is exhausted and no further applications can be entertained.

† The Royal Institute advises members not to compete.

Secondary School, Elland. Yorkshire.

The Halifax Architectural Society have offered assistance in drawing up conditions for a competition in connection with the proposed new secondary school at Elland. This offer has been made in view of the unsatisfactory nature of several recent competitions for similar buildings.

Garden Suburb Cottages, Derby.

The National Housing Reform Council are proposing to institute a competition at Derby for the building of garden suburb cottages, and a local committee has been formed to carry out the preliminary arrangements. The prizes will consist of silver and bronze medals.

Palmer's Green Congregational Church.

The designs submitted by Messrs. George Baines and Son, 5, Clements Inn, Strand, London, W.C., in a recent competition for the above have been adopted, and the erection of the buildings is to be at once proceeded with.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

The querist's name and address must always be given, not necessarily for publication.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s., made payable to Technical Journals Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

Such answers will be forwarded to the querists promptly on receipt from the respective experts, but the Editor will not be responsible for any delay that may arise. The fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies. Every effort is made to ensure correctness, but Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

The Editor expressly declines to be held responsible for any mistakes or inaccuracies that may occur, nor does he undertake to satisfy in every instance the querist's demand. The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Silent W.C. Wanted.

KEITH.—D.J.C. writes: "Is there an absolutely silent water-closet on sale?"

There are three points from which objectionable noise may arise, viz., from the ball-cock during the filling of the flushing cistern, from the air in the flushing pipe during the termination of the flush, and from the water entering the w.c. pedestal with too great a force. There are many arrangements that are more or less silent—for example, Doulton's special compact closet, with 3-gallon flushing cistern just above the seat; and the querist might inspect this firm's patent pneumatic supply valve; or Twyford's "Convenient" combination basin and cistern.

HENRY ADAMS.

Steel Columns and Struts.

THORNTON HEATH.—P.C.E.B. writes: "Will you inform me as to the value of the constant 'F' and the variant 'Cant' in Gerdon's formula $\dfrac{F}{1+c\left(\dfrac{l}{d}\right)^2}$ for steel columns and struts applicable to the various cross sections. I am only able to find these for the more or less obsolete cast and wrought iron struts. In 'specification' I find certain information given for solid rectangular and circular steel columns regarding the 'variant,' but no information applicable to the 'constant' or to the now almost universal type of joist or built-up sections."

The principal reason why the figures for the constants in Gordon's formula are not given for mild steel columns in many of the constructional books is that Gordon's formula is rapidly going out of use in favour of Rankine's somewhat similar formula.

Gordon's formula is

$$\frac{P}{A}=\frac{F}{1+C\left(\dfrac{L}{d}\right)^2}$$

where d is the *least* breadth or diameter of the section. Rankine's formula is

$$\frac{P}{A}=\frac{F}{1+a\left(\dfrac{L}{k}\right)^2}$$

where k is the *least* radius of gyration of the section. The advantage of Rankine's formula is that the variant a is the same for all shapes of the same material, whereas c in Gordon's formula depends on the shape as well as on the material.

For mild steel built-up columns the following figures may be taken:—

$F=6$ tons per sq. in.

$c=\frac{1}{3\;\;0}$ for sections with only one I beam.

$=\frac{1}{430}$ " " " two or more I beams or channels.

$b=\frac{1}{6000}$.

The formula then gives the safe load per square inch on the column.

L is to be taken as the length of the *equivalent pin-jointed column*; if the ends are fixed, L = ½ length of the column.

The matter is somewhat fully shown in the question of column formulæ in the recent text-book on "Theory and Design of Structures," by Ewart S. Andrews (Chapman and Hall, Ltd., 9s. nett), and we would recommend the querist to consult such book if he requires further information.

A.

Height for Dwarf Wall.

IPSWICH.—C. R. writes: "Please let me know the height of a dwarf wall as described for boundary walls in agreements used when new estates are laid out?"

Unless a height is specially mentioned in the agreement of tenancy or in the contract of sale, there is no particular height implied, beyond the fact that "dwarf wall" must be reasonably sufficient for the purpose for which it is intended. I have known them to be of all heights from 2ft. 6in. to 6ft.

F.S.I.

Architects' Book on Stresses.

BIRMINGHAM.—PIER STRAIN writes: "Please give particulars of a book on the calculation of strain on roofs and piers."

There is no book at present known to the writer which sufficiently explains the determination of stresses in constructional work, but a series of lectures to teachers at South Kensington upon "The Mechanics of Building Construction," will, when published, cover the whole ground. In the meantime, perhaps, Vol. IV. of "Notes on Building Construction" (Longman 15s.) will be the most useful.

HENRY ADAMS.

Responsibility for House Drains.

HARROW.—SANITARY writes: "Will you kindly inform me whether the builder or the Urban District Council is liable to correct faulty laying of drain to house? The defect is apparently either at the interceptor in front garden, a few feet from connection with road pipe to sewer, or the pipes are not laid to proper fall, as toilet-paper lies at the well of the interceptor, and in a few weeks clogs and half fills the inspection chamber with soil. The builder contracted to complete the house to the satisfaction of the district surveyor. The surveyor tested on the first day of the house being occupied, seven months ago, and was satisfied."

Neither. The responsibility is now the owner's. On "Sanitary's" showing, the builder did what he contracted to do, satisfied the district surveyor. The latter tested, and cannot be held accountable if he passed the work in good faith. It is probably quite sound so far as he tested it, and so far as his employers, the council, have any right to call upon him to test. The fault is most likely to be found in the particular make of trap that has been used, which ought to be of a self-cleansing form, with quick drop at intake, contracted at bend, short in itself, and holding little water, though with a good seal, and its discharge at outgo should be quite an inch below intake level.

INSTITUTE.

Determination of Building Line.

LYNN.—D. H. B. writes: "What is really the building line? Several villas are all built level; but now a builder is putting up a house 6in. in front of me or of the main building, but says he will keep the bay windows level with mine; still 6in. poking in front does not look well."

I conclude from your inquiry that an estate has been cut up for building purposes, and that the original owner laid out the streets and prescribed "building lines" in his "conditions of sale." These building lines must, of course, be adhered to, and I imagine that a complaint made by you to the effect that your neighbour was not respecting the building line, would be dealt with properly by the said owner or his surveyor. I advise you to lay the case before them. If the original owner has no longer any interest in the property, there is no doubt, legally speaking, that any one of the purchasers of his property may take action against another one who does not carry out his contract; but the question does arise, in my mind at least, "Is six inches worth making a fuss about?"

F.S.I.

What are Main Timbers?

HEREFORD.—INQUIRER writes: "Tenant has entered into a lease whereby landlord keeps the main timbers in repair. A question has arisen in regard to the floor boards, and the landlord contends that floor boards are not main timbers. Are they?"

Floor boards are most decidedly not "main timbers," in reference to the terms of a lease, and the tenant is, therefore, liable for their maintenance "Main timbers" are such as are structurally necessary for the upholding of the fabric itself, such as roof timbers, beams, and so forth.

F.S.I.

Architects at Messina.

NETHERTON.—READER D. writes: "(1) Are there likely to be any opportunities in or around Messina for architects? (2) From whom can the R.I.B.A. form of contract be obtained? (3) Are worked answers to the City and Guilds' questions in Quantities published?"

As we understand engineers have already been appointed to prepare plans for the rebuilding of Messina, and that the excavation of the ruins is being carried on, we are exceedingly doubtful if any architectural draughtsmen will be required there. Furthermore, the Italians are by no means behindhand in matters of building construction, even to the extent of employing reinforced concrete in many of their modern buildings. Regarding your second question, these can be obtained from the Secretary of the Royal Institute of British Architects, No. 9, Conduit Street, London, W., price 1s. Replying to your third question, we do not know whether worked answers are issued to questions of quantities set at the London and Guilds' examinations, but we should suggest that you write to the secretary at the Institute, Exhibition Road, Kensington, W.

Pavement for Slaughterhouse.

LITTLEHAMPTON.—R. C. B. writes: "What do you consider the best material to use and the best form of construction, for a floor in a slaughter house. Blue Staffordshire bricks seem to get filled up with fat, greasy matter; and Portland cement trowelled smooth off steel trowel is too slippery."

To give a good foothold, blue Staffordshire bricks, granite setts, or any form of stable paving are desirable; but, as you say, these get clogged with greasy matter and are troublesome to keep clean. The best floor is mastic asphalt, or concrete in situ. It is a matter of compromise, but with the mastic asphalt or concrete in situ paving less rake is required on the floor. Full particulars as to abattoirs are given in "Municipal Engineers' Specification," No. 2, price 3s., post free from these offices, or there is a book on this subject by R. Stephen Ayling, F.R.I.B.A., published by Messrs. E. and F. N. Spon, 57, Haymarket, S.W.

Echo in Assembly Hall.

DERBY.—E. N. D. writes: "A hall like that shown in the plate given in 'The Builders' Journal' of December 23rd, 1908, has been erected, and it is found that there is an inconvenient echo of the speeches, etc., What will stop this? What are the eight hangers for, with angular boxes attached? Are they to stop the echo? If so, how are they connected? The hall in question is 50ft. by 35ft. floor space, with a curved ceiling rising from walls 7ft. in the centre."

The "hangers with angular boxes attached" are evidently electric lighting pendants with the lamps screened to minimise the tiring effect of glare in the faces of an audience whose gaze is necessarily directed towards the platform. It is, however, quite possible that these fittings may not be without some influence in breaking up sound waves, and thus preventing echo. Wires are often stretched across domes and curved ceilings, textile hangings, and other non-resonant substances around the walls often has a similar effect. Experiment upon these lines is practically all that can be recommended. As an instance of the backward condition of the science of acoustics in this country, it may be said that a well-known architectural body, desiring to arrange for a paper on the subject, failed to discover an author willing to treat it. The only way in which a satisfactory acoustical result can be assured appears to be by the repetition of a form of apartment which has been proved successful in execution. G.

Pointing in Chimney Shaft.

"The brickwork joints of a chimney shaft are to be raked out and pointed (weather joint) in mastic cement and oil. Can you tell me, please, what price per yard super you consider fair for this work (exclusive of scaffolding, a lump sum for which has been agreed to)? Have never heard of pointing being done in mastic until the present case."

In reply to the above letter, which you kindly forwarded me, I have never heard of a brick chimney shaft being pointed in mastic cement and oil, and should imagine it to be the novel idea of a young architect. Rea's "How to Estimate" (Batsford, 7s. 6d. net), a most useful book, makes no mention of pointing in mastic, but gives "Pointing new work, flat-struck joint in lime mortar per yd. super., 1s. 9½d.; ditto in coal, ash or blue lias, 1s. 11d.; ditto in cement mortar, 2s. 1d.," and says "Pointing is best given out as piecework, which urges the men to execute as much as possible. A bricklayer who makes pointing a speciality is called a 'wigger' in some parts, and will point, including raking out joints and providing his own stuff, but no scaffolding, at a contract rate of 7d. per yard super, with wages at 9d. per hour. This is about 1¼ yard per hour." Also, "Raking out old mortar joints, colouring, and flat-joint pointing has been sub-let in London at 8s. per 100ft. super, for material and labour equals 1d. per ft. super., equals 9d. per ft. super." In cement mortar a bricklayer and labourer will rake out and point about eight yards super per day." Brick for carving is sometimes set in a mastic composed of powdered brick, of the same kind as the brickwork, mixed with boiled linseed oil and litharge, but there would be no advantage in using this for pointing a chimney stack.

Henry Adams.

Lessee's Liabilities.

Ipswich.—C. B. S. writes: "A lady has let a house for £25 per annum to a tenant who runs it as a boarding-house and makes, I am informed, over £200 profit. The tenant who is a doctor, and mayor of the borough, has the house on lease (several years of which have run), and writes to say that in future he will not pay the rent as per agreement, but will make a deduction equal to the amount of his income tax on that house. Has the tenant any claim whatever, in this respect, on the owner? Ought the owner to write at once and say that she will not allow any deduction, or wait until the deduction is actually made?"

So long as the tenant fulfils the conditions of his lease, it is no business of the landlord as to the profit he makes by his use of the premises. The landlord is liable for income tax, Schedule A (commonly termed "Landlords' property tax"), upon the income he draws out of the property, and no doubt the inland revenue authorities collect this tax (as is usual) from the tenant. The tenant is then entitled to be reimbursed by the landlord, when he produces the tax receipt, and is indeed liable to a penalty of £50 if he does not so allow the amount of the tax out of the next payment of rent. The assessment upon which the landlord should pay in this case is £25 (if that be the true annual rental value of the premises), less the amounts payable for tithe rent charge and landlord tax (if any), and a statutory allowance of one-sixth (£4 3s. 4d.) for repairs (if he does them). You should purchase one of the small handbooks on these subjects—a very useful and recent one being "Rates, Taxes, and other outgoings," published by Effingham Wilson, at 3s. 6d. F.S.I.

Use of the "Centrolinead."

Kingston-on-Thames.—Perspective writes: "(1) What other advantage has a centrolinead beyond bringing a distant vanishing point upon the drawing board? (2) What is the orthodox method of using this instrument? How is the position of 'mounts' or 'studs' fixed?"

(1) There is no other advantage beyond that named in the use of a centrolinead. (2) The method usually adopted for setting the instrument is one of trial. Two lines converging to the distant vanishing point are first obtained as shown in Fig. 1, in which A B, a face of the building, touches the picture plane P P at A. The plan lines are vanished to the station point S P in the usual manner, and from their intersection with P P verticals are dropped as shown. The corner A being in contact with P P is set up at A′ A′ to scale. To obtain the height of B, take in P P any point M P, draw line from same to S P, and from point B on plan draw line parallel to same, cutting P P in D. Drop perpendicular from M P1 to horizontal line H L at M P2, and from D through D′. Set up on D′ the actual height at angle, and vanish to M P2, cutting the projection of the plan point B by the vertical dropped from C, in B, B′. Lines drawn through A′ and B′ will now converge to the distant vanishing point. Having obtained these lines, the centrolinead must be adjusted until its edge will be truly along the three convergent lines, when the arms are moved along the pins. To do this a vertical line is first ruled and the guiding pins A and B are fixed on this at equal distances above and below the horizontal line (for convenience about 15in. apart). The ruling edge is then laid along the horizontal line, and the arms adjusted and clamped by the set screws C and D, so that they lie in contact with the pins. By this procedure the arms will be fixed at equal angles. The ruling edge is next moved up and down, with the arms still against the pins, to test whether it coincides with the upper and lower lines. This it probably will not do at the first attempt. The instrument is, therefore, readjusted by slackening the thumbscrews and increasing or diminishing the angle of the arms until this result is attained, when the centrolinead is ready for use, and all lines ruled by its edge, with the arms lying against the pins will converge towards one point. The pins A and B should be fixed with their long axes approximately perpendicular to the arms when the ruling edge is along the horizontal line. G.

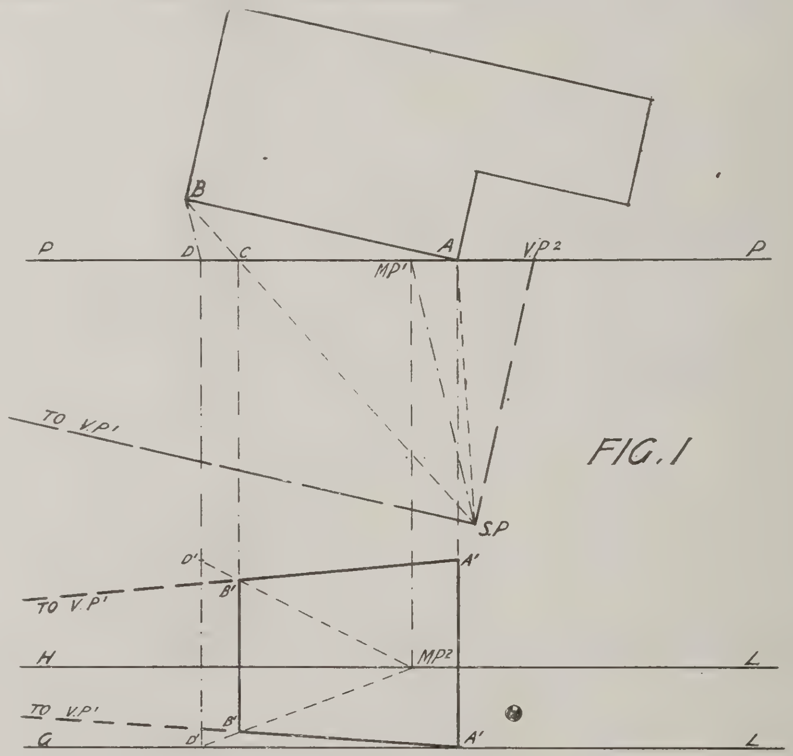


FIG. 1

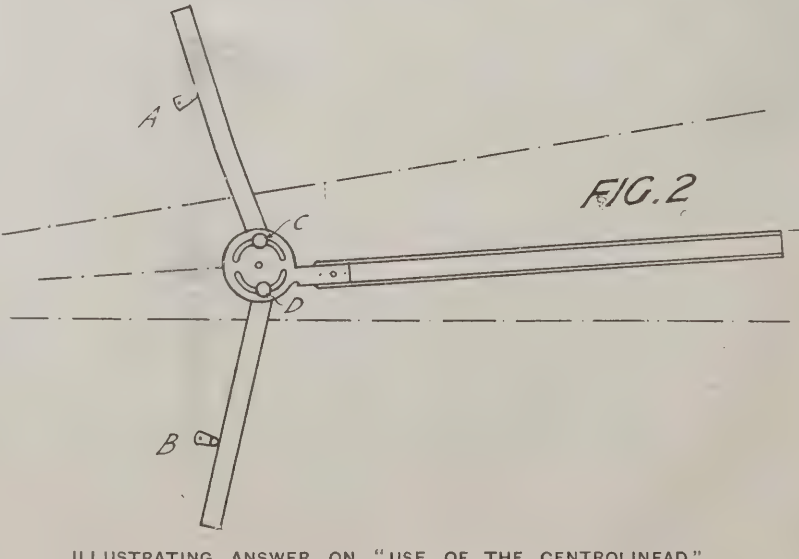


FIG. 2

ILLUSTRATING ANSWER ON "USE OF THE CENTROLINEAD."

FIRE-RESISTING CONSTRUCTION SECTION.

(MONTHLY.)

THE DANGER OF FIRE IN EARTHQUAKE ZONES.

It now seems certain that the dirge of the newspaper correspondents—"Messina is no more"; Messina is blotted out and will never rise again"—was a little premature; for the inhabitants and the Italian Government have other ideas, and despite the treacherous nature of the soil on which they live, are determined that Messina *shall* rise again. Already the task of excavating the ruins is begun, this work and the removal of the many bodies which, alas, are still lying under the debris, must occupy a considerable amount of time. Plans for the rebuilding of the city are being discussed; commissions are being appointed to consider the most suitable form of structure for the troubled area, and the experience of other countries subject to earthquake shocks, will doubtless be considered in formulating a decision. But in most of the discussions that have ensued, as a consequence of the recent terrible disaster in Calabria and Sicily, small attention appears to us to have been bestowed upon the important question of fire, which invariably follows in the track of severe and destructive earthquakes, and which, in the case of San Francisco, created greater havoc than the seismological disturbance.

Dangers of Civilisation.

Our present advanced state of civilisation affords so many opportunities for the outbreak of fires in such circumstances, that it appears, at first sight, impossible to provide for the needs of a population without incurring many grave risks. The fires burning in open grates may be thrown out on to floors or carpets by comparatively slight shocks, and by the fall of a building may come into contact with woodwork or other combustible material. Electric currents may, by the breaking of the cables, short circuit with similar effects; overturned oil lamps are a prolific source of fire; and in most cases such local beginnings of fires are turned into great conflagrations by the breaking of the gas mains and the escape of large volumes of coal gas. Indeed, the latter is pretty certain to be the predominating, if not the preliminary, cause of a great outbreak.

In the case of a town, lighted entirely by electricity, the danger of fire would seem to be considerably diminished, since in the case of great destruction the central station will probably share the fate of most of the other buildings, and the current would be at once extinguished at its source. Moreover, the use of electricity for motive power in factories and workshops, and for trams and trains, would eliminate the necessity for furnace fires, and its introduction for motive power, on a large scale, would establish that much desired dayload that lessens the production cost and gives opportunity for supplying current for lighting purposes at low rates. In towns on the seacoast, it should not be impossible to devise some means of water-power for the manufacture of current, which would obviate the danger of fire at the central station.

In a genial climate, such as that of Messina, the number of coal fires is very small, and such heating as is required could probably be effected by electricity also. This is not to overlook the fact that such a form of heating would probably prove more costly than by fires, but in earthquake zones it might be necessary to restrict the liberties of the inhabitants in some respects for their own safety, and the general well-being. The use of oil lamps would seem to us a risk that should altogether be eliminated, and similarly, coal gas is too dangerous an illuminant for towns on treacherous soil.

The new lighting medium, air-gas, would probably obviate the risks that attend the use of coal gas, since the gas on diffusion in the air, at once becomes harmless, there being only 1½ or 2 parts of petrol vapour to 98½ or 98 parts of air in its composition. The storage of the petrol required for its manufacture introduces a new and grave risk, however, and though largely used for lighting isolated dwellings, we are doubtful if it could, like coal gas, be manufactured in places well removed from the town and conveyed for any considerable distance in pipes.

Incombustible Buildings.

Apart, however, from risks inseparably connected with the supply of light and heat, there remains the momentous question of the combustibility of the buildings, and in this regard the grievous loss of life in the recent catastrophe has, unfortunately, obscured the issue in some directions. It is not sufficient that the buildings should be constructed in a manner to resist the earthquake shocks; they should also be able to resist fire. This fact gains point from the recommendation in a London daily paper, that the wooden earthquake-resisting houses of Japan should become the model for the rebuilding of Messina and Reggio. The wooden city is a city of the past, and, obviously, to build wooden cities is to invite at some future time a catastrophe more horrible and appalling than that which occurred last December. There is no case against modern building methods to be made out of the havoc on that occasion. Messina, as photographs of the ruins reveal, must have been one of the most flimsily built cities that ever existed. The fine stone fronts of its Palazzata concealed crumbling walls of rubble and 4½in. brick arches; and with the known possibility of earthquakes, it is more than likely this jerry-building was deliberately adopted to avoid expense in buildings that their owners felt might be suddenly destroyed. Cynicism could no farther go.

There has been a rather widespread advocacy of the steel frame building as the basis of future construction in the ruined cities, and so far as the frame is concerned, the lessons of San Francisco have proved its suitability for resisting shock. But if, as is usually the case, the walls of the steel-frame building are merely hung on to it, as it were, and if such structures are roughly shaken up, the probability is that the walls will shell off the frame and descend on to the passers-by, adding to the deal-roll and the panic. Indeed, the case of some of the 'Frisco buildings have already proved this.

Reinforced Concrete Monolith Structures.

Undoubtedly the type of building most fitted for earthquake zones is the monolith reinforced concrete structure, wherein the foundations, outer walls, partition walls, floors, staircases, and roofs, are firmly banded together by the reinforcement. At a conference in Paris, two or three weeks ago, this same conclusion was arrived at, and we believe the Italian authorities are not insensible to the merits of this form of building for the particular work in hand. It is said that there were three or four reinforced concrete houses in Messina and Calabria, which successfully stood the shock; but from some notes by "The Times" correspondent, we gather that they were steel-framed structures with reinforced concrete floors, and not of true monolithic construction. As an additional precaution, it would be desirable to widen the streets so that the collapse of a building does not block the street with debris and prevent the escape of the inhabitants or the approach of aid.

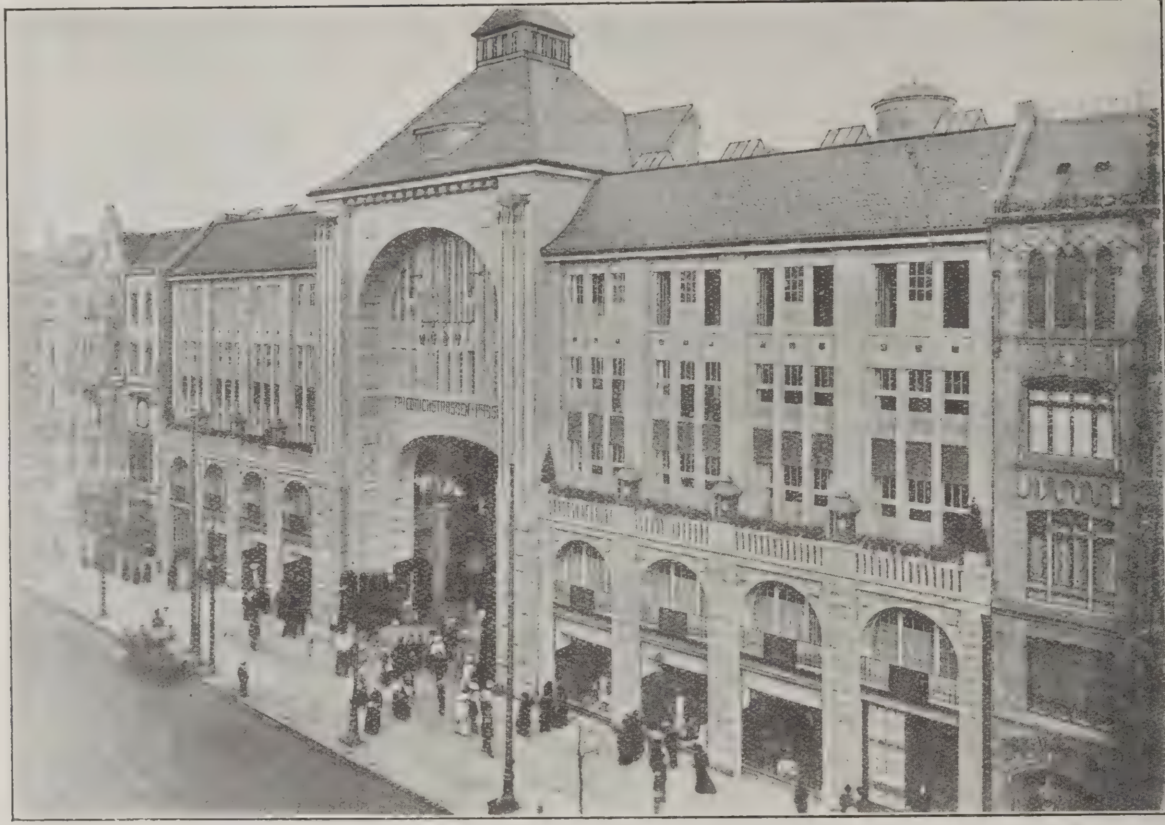
The lesson of San Francisco has borne fruit so far as the rebuilding of Kingston, our Jamaican capital, is concerned, for here the Government and other important buildings are being rebuilt in reinforced concrete; and we doubt not that in future this form of construction will be generally adopted in all earthquake zones, not merely as a safeguard for life and limb, but as an additional precaution against the horrors of possible conflagrations, of which earthquakes are so fruitful a cause.

HIGH-PRESSURE FIRE PROTECTION.

The high-pressure fire protection system observes an American correspondent of the "Times," may conveniently be divided into two parts: the system of distribution, and the pumping stations. The pumping stations pump the water from the mains, or in case of emergency from the river, or both, forcing it into the mains of the distributing system, where it circulates under pressure, and whence it is delivered from the hydrant nozzles for fire extinction. At the present time the distributing system of New York extends from Twenty-third Street to Chambers Street, and from the Hudson River to Fourth Avenue, the Bowery and Park Row. This entire district is covered, with the exception of a few blocks in the north-west section between Seventeenth and Twenty-second Streets. The district protected includes approximately 1,456 acres, and comprises about 297,000ft., or 56 miles of mains, with 1,274 hydrants, 2,191 valves, or four at every inter-section, for sending the course of the water in any direction where an excess of normal may be required. It is to be understood that this entire installation is independent of the ordinary city water supply, and has no connection therewith save through the pumping stations. Various sizes of pipes for mains were used, from 8in. to 24in. in diameter, according to requirements of distance from the pumping stations; that is, a complete belt line of 24in. main surrounds the district upon, or a short distance within, its marginal streets; from this artery, lines of 20in. main extend, and so on. This system was laid, tested, and repaired as shown necessary under test, and re-tested, in 17 working months, or at an average rate of 700ft. per day. The daily rate sometimes reached 1,400ft. per day.

In the near future the system will be extended to cover the territory between its eastern limits and the East River, and as far north as Houston Street. An appropriation amounting to £360,000 has recently been voted for this purpose by the Board of Aldermen. This will substantially cover the region regarded as embracing the greatest fire risks.

Both of the pumping station buildings are of brick and steel fireproof constructon, on concrete foundations. Each station at present contains five multi-stage centrifugal pumps driven by induction motors. These were furnished by the Allis-Chalmers Co., Milwaukee, Wis., and space is provided in each station for the installation of three more similar units. The present capacity of the combined stations is 30,000 gallons per minute, delivered at a pressure of 300lb. per square inch at the hose nozzle. Each station building is 64ft. by 97ft., and consists of one storey and basement. The pumps are located along the sides of the building on the main floor. Each is capable of delivering 3,000 gallons per minute against a discharge pressure of 300lb. per square inch when running at 750 revolutions per minute. All internal parts are of bronze composition. The pumps are kept primed for instantaneous service, and by means of regulators and relief valves the discharge can be maintained at any pressure between 100lb. and 300lb. per square inch.



THE PASSAGE KAUFHAUS, BERLIN: AN ARCADE OF SHOPS CONSTRUCTED OF REINFORCED CONCRETE.

A BIG BUSINESS BUILDING IN BERLIN.

The Passage Kaufhaus, Berlin, which has been recently completed, offers some points of novel interest to architects and builders, as it appears to inaugurate a new method of business organisation, requiring special arrangements in the building. The Passage Kaufhaus represents an organisation of about sixty retail traders, who, associated under one roof, enjoy all the advantages of the wholesale stores, and yet are entirely independent of each other as regards selling goods and making profit. A central office, maintained at the general expense, undertakes the free delivery of sold articles, the collection of money, advertising, and other matters that can be conveniently centralised. It is a novel form of co-operation and intertrading. The public also benefit in various ways, for they enjoy all the advantages to be found in a big store, including the use of parlours, restaurants, reading room, and other conveniences.

The building has been erected on a site of 8,700 square meters, and, in order to make room for it, no less than seven city houses had to be purchased and pulled down, requiring an outlay of eight million marks, while the new building has cost a further 8½ million marks.

The building is situated only a few minutes from the most frequented railway station in the city, and its two fronts run along crowded streets, which are now connected by an arcade running through the building. The arcade, affording a much appreciated means of getting from the one street to the other, is, of course, a valuable means of attracting buyers. Reinforced concrete has been mainly used in the construction. Foundations, pillars, floors, and all roofs, including the large cupola (having a diameter of 30 metres and being 45m. high), are constructed of this material. The Berlin building department requires a guarantee that the plastering shall not fall off. In this building all the ceilings are without plaster, and are simply painted.

Along the Friedrichstrasse, which is probably the most important business street in Berlin, this store has a frontage of 57 metres; the other front, on the Oranienburgerstrasse, being 67 metres long. These two streets are connected by the arcade within the passage store, a glass-covered walk 13 meters wide and nearly 150 metres long. Both entrances are immense portals two storeys high. The arcade is not in a continuous straight line, but its two approaches form an angle in the centre, which is surmounted by a large cupola. Limestone and marble are chiefly used in addition to the reinforced concrete. Statues and ornaments of stone or bronze are encountered at every turn, and the majolica works belonging to the Emperor have furnished much material. A unique feature is that the store contains a railway station. The city of Berlin has an underground line from north to south, cutting through the central portion of Berlin, and upon request a station was provided underneath this store.

The arcade is lined with about sixty windows, representing each of the sixty retailers. Several doors lead from the arcade to the salesrooms on the ground-floor, while spacious stairways lead to the second floor. To reach the others, one can use the numerous stairways contained in the house itself or one of the 23 elevators. At certain intervals the arcade is spanned by bridges, some of them as high as the fifth floor. The stairways are made of artificial stone, with iron railings and rich ornamentation. The stairways within the salerooms are of steel and polished marble. In the building, ten staircases go through all the storeys outside the salerooms, while nine are within them. In addition, eleven elevators help to carry the public up and down, while for freight ten special lifts, varying in size, are provided, as well as six spiral shutes for smaller articles. The largest elevator occupies a floorspace of 30 square metres, and can lift 2,500 kilograms. It will be used for pianos, safes, motor-cars, etc. The doors separating the shaft from the floors are constructed in accordance with the latest official regulations.

The long line of salerooms is here and there interrupted by a large hall, each of these halls representing a different style. For instance, one is built like a Turkish chapel, and here Oriental rugs, etc., are sold; while a "Blue Salon" has the lower part of the walls covered with blue velvet, the "Yellow Salon" has pillars of Siena marble, and in the "Red Salon" the walls are fitted with mahogany panels to a height of 7½ metres, and there is also a mahogany gallery. In the rooms in which provisions are sold, walls and floors are of white tiles, and a system of pipes from the ice-machines in the cellar go through this floor, so that meat, cheese, butter, etc., can be kept fresh for many days during the hottest summer. In the cellar have been installed a vacuum apparatus for cleaning the whole building, several exhausters for the pneumatic cash system, the above-mentioned ice-machine, and a remarkable carrying arrangement for parcels. When a customer has bought anything, the parcel is thrown on the spiral shute, which has openings on each floor. It slides down and falls upon a continuously moving endless band in the cellar, which carries it to the central room beneath the cupola. Here the parcel falls upon a rotating table, around which several attendants are sitting. At last it arrives in front of the man having charge of the delivery to the district to which the goods are addressed, and he puts the package into a wagon, which delivers four times a day.

The first military church on Salisbury Plain has been opened at Tidworth. It is to be named St. Andrew's Scottish Church, and has been built under the direction of a War Office Advisory Committee.

* * *

A useful Calendar has been issued by "Concrete and Constructional Engineering." It has a series of notes or hints upon what to avoid in order to prevent errors in the making of concrete, called "Dont's on Concrete." These hints, however, serve not only as preventives, but form instruction as to what is necessary to make a good strong concrete.

* * *

"English Church Architecture" is a new volume by Mr. G. A. T. Middleton, A.R.I.B.A., in the "Library of First Principles" series that is being published by Mr. Francis Griffiths.

THE PASSAGE KAUFHAUS, BERLIN: VIEW SHOWING BRIDGES OVER THE ARCADE.

HARD WOODS AND FIRE RESISTANCE.

The question of the relative value of different timbers from the fire point of view has become a matter of some importance; for the purchase of oak, teak, jarrah, and karri, as allowed under the Building Act, is a somewhat expensive matter, and the London County Council now have power to sanction, at their discretion, certain other timbers as being fire-resisting.

A systematic series of tests on a small scale has been conducted in Germany with beech, oak being used for purposes of comparison. This series of tests has given rise to a certain amount of controversy in Germany, and as the matter is of equal importance in this country, we are publishing the report in full.

Laboratory tests no doubt are most valuable, up to a certain point, for the results as demonstrated in full-sized tests are sometimes very different from those obtained from small test pieces in a laboratory. Thus, 1-in. square sections of wood under test give, say, a comparative, but not a definite result as to what baulks of timber or heavy timber flooring will do.

The nearest approach to what different timbers will actually do in fire can be gleaned from the report of the British Fire Prevention Committee on the series of door tests which they are undertaking, where numerous doors of 2in. thickness of different timber have been under test. Similarly, their tests with sections of heavy warehouse floors, measuring 20ft. by 10ft., and conducted with various timbers, should serve as a practical guide. We, nevertheless, congratulate the German authorities on their having taken the matter up from the laboratory point of view, for there is no doubt that the results of these laboratory tests when read with the results of the full-size tests conducted in Great Britain, must together give a very clear summary of the relative value of different timbers from a fire point of view.

It will certainly soon be necessary to increase the present list of hard woods, or of woods permissible as fire resisting woods, and further investigation on the subject will thus be welcome. The report below is, we think, one of the most interesting of its kind.

Fire-Resistance of Beech and Oak

(A report prepared by Professor Hornberger and Mr. Sellheim, surveyor of woods and forests, on tests that were conducted in accordance with instructions of the Prussian Board of Agriculture, with the object of ascertaining the feasibility of allowing the use of beech instead of oak in the construction of wood staircases. As the particulars of the tests are likely to be of general interest, they are here given.)

The specimens in each case were:—

(a) Pieces of boards, 1m. long, cut on the square, the cross section being 1 sq. cm.; (b) stair treads 1m. long, 4cm. thick, and 4.8cm. wide.

Both woods had about the same amount of dampness in them, the oak having 18.03, the beech 15.41. Three series of tests were made.

Tests: Series A.

Two gas burners were used, and were allowed to burn until about equal temperature was obtained from both jets. A piece of the beech and a piece of the oak were then heated simultaneously by these burners. These pieces were placed in a horizontal position, and fixed in a frame at one end, but were loose at the other, the fire being applied 20cm. from the loose end, and the time being recorded when they had burnt through and broken; and, secondly, measurements were taken to see how far down in length the pieces had charred at the time the wood broke. In order further to make good any inequality in the heating power of both burners, one and the same burner was applied alternately under the beech and under the oak. The result was as shown in table I.

The beech broke sooner than the oak in nine cases out of sixteen. In the remaining seven cases, the oak broke before the beech. In section, the beech broke after 2½ min., the oak after 3 min. Excepting in two cases, charring took place to a greater extent with beech than with oak. In the first place, it was to the extent of 135mm.; in the latter case, to the extent of 100mm. In the burning off, the section of the beech at the burning point was lessened considerably more than in the case of the oak, which left a thicker charred part.

TABLE I.

The numbers of tests applied to the same piece of oak and beech wood are enclosed in brackets.

No.	Wood used.	Breaking Point.		Extent of the Charring.			
		Oak.	Beech.	Oak.		Beech	
		—	—	On the Fixed Side.	On the Loose Side.	On the Fixed Side.	On the Loose Side.
		Min.	Min.	mm.	mm.	mm.	mm.
(1	Oak	3¼					
	Beech		2¾				
(2	Oak	5½					
	Beech		2				
(3	Oak	1¾		52	54		
	Beech		2½			61	58
(4	Oak	4		61	44		
	Beech		6			39	76
(5	Oak	1½		53	50		
	Beech		2			97	74
(6	Oak	1¾		52	47		
	Beech		2			88	50
(7	Oak	2¼		43	55		
	Beech		1¾			91	100
(8	Oak	4		50	40		
	Beech		2			77	44
(9	Oak	1¼		50	46		
	Beech		2			52	44
(10	Oak	3¼		41	65		
	Beech		2			32	66
(11	Oak	2		50	44		
	Beech		1¾			50	86
(12	Oak	6		50	44		
	Beech		2			71	60
(13	Oak	3		62	57		
	Beech		2			34	55
(14	Oak	2½		44	40		
	Beech		3			57	120
(15	Oak	3¼		49	55		
	Beech		3			47	80
(16	Oak	3		49	55		
	Beech		3¼			116	64
Together		48¾	40	706	696	912	977
				1902		1889.	
Average		3.0	2.5	100.14		134.93	

Tests: Series B.

It was equally important and difficult to find a method of obtaining data regarding the burning point of the two woods. After several preliminary trials, the following procedure was adopted. It was desired to ascertain how long it would take for beech and oak of equal form and equal section to catch fire, the same temperature being applied and the conditions of test being equal. The pieces of wood were laid in horizontal position, and in such a manner that the upper and under surface were also horizontal, and were fixed in the frame at one end, so that the pieces of wood to be compared (one beech and one oak), touched the burners at equal height. The burners were then fixed slantingly, by means of a solder, under the middle line of the beam, and just at the point to be heated, at least 15 to 20cm. from the end of the beam.

In order to obtain good times for testing purposes, a considerable distance would have had to be maintained between beam and burner, if the burner had been put on full flame—whereby some uncertainty would, however, have existed as to whether the intensity of heat applied to the two pieces of wood under test was absolutely the same in both cases. For this reason only a small flame was applied, which was constantly regulated and controlled by an inserted manometer, according to which the pressure was, as far as possible, the same all through the test.

As the results on the two objects under test (beech and oak) followed one another absolutely, and as each test only lasted a very short time, any difference of intensity could only have been very small. But any inequality might occasionally produce great differences in the single test, owing, perhaps, to differences in the construction of the wood at the particular point, or differences in the degree of dryness, or in the conductivity of the warmth of any inflammable gas in and around the wood, and so forth.

In Table II. will be found the times (given in minutes and seconds) which elapsed between the time when the gas-flame was applied to the woods and when the wood caught fire.

Although it will be observed that, at the commencement of the series, the oak caught fire first, this order was variable; and it will be found further down that sometimes it was the beech and sometimes the oak which started to burn first. Further, taken on the whole, the difference is but small, and the oak was at a slight disadvantage; for in 14 cases out of 26, the oak caught earlier than the beech in the earlier tests. Later, the oak caught in 10 cases out of 26; in 2 cases out of 26 both woods caught at the same time.

The mean time in which the beech caught fire was 2min. 26sec. The mean time in which the oak caught fire was 2min. 16sec.

TABLE II.

Time elapsed until the wood caught fire (Minutes and Seconds).

No. of Tests.	Beech.	Oak.	No. of Tests.	Beech.	Oak.
1	1′ 45″	0′ 50″	15	1′ 30″	2′ 0″
2	1′ 40″	1′ 20″	16	1′ 30″	0′ 50″
3	2′ 5″	1′ 25″	17	1′ 20″	1′ 30″
4	4′ 50″	2′ 50″	18	0′ 50″	1′ 5″
5	3′ 10″	3′ 10″	19	3′ 15″	2′ 40″
6	5′ 0″	3′ 30″	20	2′ 30″	1′ 30″
7	3′ 30″	4′ 10″	21	2′ 20″	1′ 45″
8	3′ 0″	3′ 25″	22	2′ 0″	1′ 55″
9	2′ 30″	3′ 50″	23	1′ 45″	1′ 50″
10	2′ 30″	3′ 25″	24	1′ 55″	1′ 35″
11	3′ 0″	2′ 50″	25	1′ 15″	2′ 30″
12	2′ 55″	2′ 35″	26	1′ 30″	1′ 30″
13	2′ 25″	1′ 40″			
14	3′ 10″	3′ 20″	Aver.	2′ 26″	2′ 16″

In the last 11 tests undertaken, it was endeavoured to ascertain how long it would take for the beam which had caught fire to continue to burn by itself if the flame of the burner were applied for 30secs. Furthermore, it was endeavoured to find out how far the charring (blacking, including browning at the edges) would extend along the length of the beam as a whole, after the wood flame had been extinguished.

The results of these tests are indicated in Table III. in two groups. Under *a* these tests are given where the oak commenced to burn earlier than the beech, and in *b* those tests were the oak commenced to burn later; or, at any rate, not earlier than the beech; whilst in Appendix *c* will be found the results of those tests undertaken on one and the same beam, results of tests which should be read together being put in brackets.

On the whole, the burning by itself took somewhat longer in the case of the beech than in that of the oak. In the beech it was 1min. 15secs.; in the oak it was 40secs. The greatest difference is found in the averages of the tests under *a*, where the beech caught later, and therefore had heat applied to it for a longer time than the oak. On the other hand, however, the number of cases where the beech continued to burn longer by itself than the oak is smaller than the number of cases where the reverse took place. The beech continued to burn longer by itself than the oak in four cases out of 11. Calculating the average length of time, it was found to be 140secs.

The beech burnt on for a shorter time than the oak in six cases out of 11, and the average of the shorter time was found to be 30secs. In one case they were equal, inasmuch as both woods continued to burn. Altogether the beech continued to burn by itself seven times in the 11 cases, the oak eight times.

The extent of charring after the extinction of the wood flame varied, on account of the difference of time in the application of heat and the time in which the woods burnt on by themselves, but taking the average, and also counting by cases, it was greater in the beech than in the oak.

The tests reported in table III. under *c* show that the results—continued at different points of the same beam—vary very little as compared with those taken on different beams. Taking an average, the following is what happened. On the first pair of beams (tests 20, 22, 24) the oak burnt sooner than the beech, but on an average the oak did not continue to burn by itself for as long a time as the beech, and the charring was less. In the case of the following pair of beams (tests 21, 23, 25), the average proved the reverse, and in the case of the third pair, the same took place as in the first.

We further found on examination of tests B and A:—(1) That in the wood employed here the oak proved more easily inflammable than the beech. (2) We find a greater number of cases where the oak continued to burn by itself and over a longer period than the beech. (3) We find that the average time where the oak continued to burn by itself is shorter in the case of the oak than in the beech. (4) On the average, the charring is less in the oak (B and A). (5) On the whole, it took longer for the flame to penetrate right through the oak than in the case of the beech (A).

TABLE III.

No. of Tests.	Time elapsed until firing. Min. & Sec.		Time occupied by the woods in continuing to burn by themselves. Min. & Sec.		Extent of Charring.	
	Beech.	Oak.	Beech.	Oak.	Beech.	Oak.
(a) Tests in which the oak commenced to burn sooner than the beech.						
16	1′ 30″	0′ 50″	1′ 30″	0′ 30″	70	70
19	3′ 15″	2′ 40″	2′ 25″	—	130	60
20	2′ 30″	1′ 30″	0′ 30″	1′ 0″	50	70
21	2′ 20″	1′ 45″	—	0′ 20″	50	75
22	2′ 0″	1′ 55″	—	—	75	55
24	1′ 55″	1′ 35″	1′ 45″	—	60	50
Aver.	2′ 15″	1′ 42″	1′ 2″	0′ 18″	72.5	63
(b) Tests in which the oak did not commence to burn sooner than the beech.						
17	1′ 20″	1′ 30″	5′ 50″	1′ 40″	180	65
18	0′ 50″	1′ 5″	0′ 20″	0′ 35″	60	55
23	1′ 45″	1′ 50″	1′ 25″	1′ 55″	75	60
25	1′ 15″	2′ 30″	—	0′ 40″	50	50
26	1′ 30″	1′ 30″	—	0′ 45″	70	60
Aver.	1′ 20″	1′ 41″	1′ 31″	1′ 7″	87	58
Average of (a) and (b)	1′ 50″	1′ 42″	1′ 15″	0′ 40″	79	61
(c) Tests on the same beams. (The number of tests applied on the same beech and oak beam are in brackets.)						
20	2′ 30″	1′ 30″	0′ 30″	1′ 0″	50	70
22	2′ 0″	1′ 55″	—	—	75	55
24	1′ 55″	1′ 35″	1′ 45″	—	60	50
Aver.	2′ 8″	1′ 40″	0′ 45″	0′ 20″	62	58
21	2′ 20″	1′ 45″	—	0′ 20″	50	75
23	1′ 45″	1′ 50″	1′ 25″	1′ 55″	75	60
25	1′ 15″	2′ 30″	—	0′ 40″	50	50
Aver.	1′ 47″	2′ 2″	0′ 28″	0′ 58″	58	62
16	1′ 30″	0′ 50″	1′ 30″	0′ 30″	70	70
18	0′ 50″	1′ 5″	0′ 20″	0′ 35″	60	55
Aver.	1′ 10″	0′ 57″	0′ 55″	0′ 32″	65	62

It should not be forgotten, however, that the differences are generally only small, and that any deductions should be taken from the average thickness, whereas the single tests often gave just the opposite results. The differences are, perhaps, best explained if one considers the powers of conductivity of the two woods in the first place. In the case of the oak, this power is, on the whole,

PASSAGE KAUFHAUS, BERLIN: THE LIFT ENCLOSURES.

PASSAGE KAUFHAUS, BERLIN, STORES FOR THE SALE OF FOODSTUFFS.

less than in the beech, which was proved in the three series of tests with stair treads, where the volume by weight of the oak was a lower one. The heat applied to the beam by means of the burner would, in the case of the wood with the least conductivity (the oak), remain concentrated at the point where it was applied, and would thus, under equal circumstances, lead to an earlier lighting of the developed wood gases than in the case of the wood possessing the higher conductivity, where the heat applied would distribute itself over a greater volume of wood, and so the temperature at which inflammability is reached would only be attained after a longer period of time. This would mean that, once the point of inflammability is reached, and the application of heat is continued for a sufficiently long time (the half-minute allowed in the tests was, perhaps, not always sufficient), the formation of a greater fire surface in the case of the wood possessing the higher conductivity, and in consequence (putting aside the original heating point) had a longer and more extended burning by itself after the flame had been withdrawn.

The tests undertaken do not seem to show that any particular preference should be given to one wood over the other on account of danger from fire.

(To be Concluded.)

"MON'LITHCRETE": A NEW METHOD OF CONSTRUCTION.

Mr. Mark Fawcett, of the Fawcett Construction Co., Ltd., 50, Queen Anne's Gate, Westminster, has been for many years experimenting with a view to the better adaptation of girders for use in combination with concrete. The first idea that suggested itself was that used in this combination, some portions of the girder was superfluous. Mr. Fawcett therefore began by reducing the 3in. top flange to 2ins., thus reducing the original weight of 12lb. per foot to 10lb. per foot without loss of strength, the concrete taking one-third of the longitudinal compression. In testing these girders to breaking, it was found that in each case failure was caused, not by elongation of the bottom flange, but by the web buckling. These results suggested the idea of ascertaining what metal was superfluous in the web, and what could be done to prevent the buckling. Ultimately he decided to make large rhomboidal openings in the web, leaving tension bars pitched to the right and left of the centre at an angle of 45 degrees. The girder thus treated may be compared to a lattice girder with the compression bars removed; the concrete taking the vertical compression, while buckling is prevented when there is only tension metal in the web. The openings are continued not quite to each end, the web being kept solid at the bearing. In this way the weight is reduced to 7.3 lbs. per ft. as compared with the 12lbs. of the unmodified girder, but the strength is maintained and probably stability is increased by the provision against the expansion of concrete, which, passing through the openings in the webs, is held by the tension bars, and through them by the flanges. Small twisted bars can be passed through the web openings of paired girders. These bars, imbedded in the concrete about two-thirds down in the thickness, or below the axis, become tension bars longitudinally and vertically. This form of construction was tested, in the presence of a large number of architects and others, at the firm's works, Tunnel Avenue, East Greenwich, on Saturday last, as well as on Saturday week, the first test having left the slab intact, although it was loaded beyond the breaking weight (16.8 tons) of two 6in. by 3in. by 3in. by 12lbs. ordinary rolled steel joists. The subject of this test was a slab of 16ft. clear span, 2ft. 6ins. wide and 7½ins. thick, containing two 6in. by 3in. by 2in. mon'lithcrete girders, each weighing 7.3 lbs. per foot. At the point which had been reached when the test was adjourned, the deflection was not more than an inch, and only slight cracks had appeared on the lower surface of the concrete for which only five weeks had been allowed for setting. Destruction had not occurred with a load of 25 tons." The merits claimed for this system are: absolute safety, high fire-resistance, rapid construction, and low cost, and the experiments will be the subject of a further report.

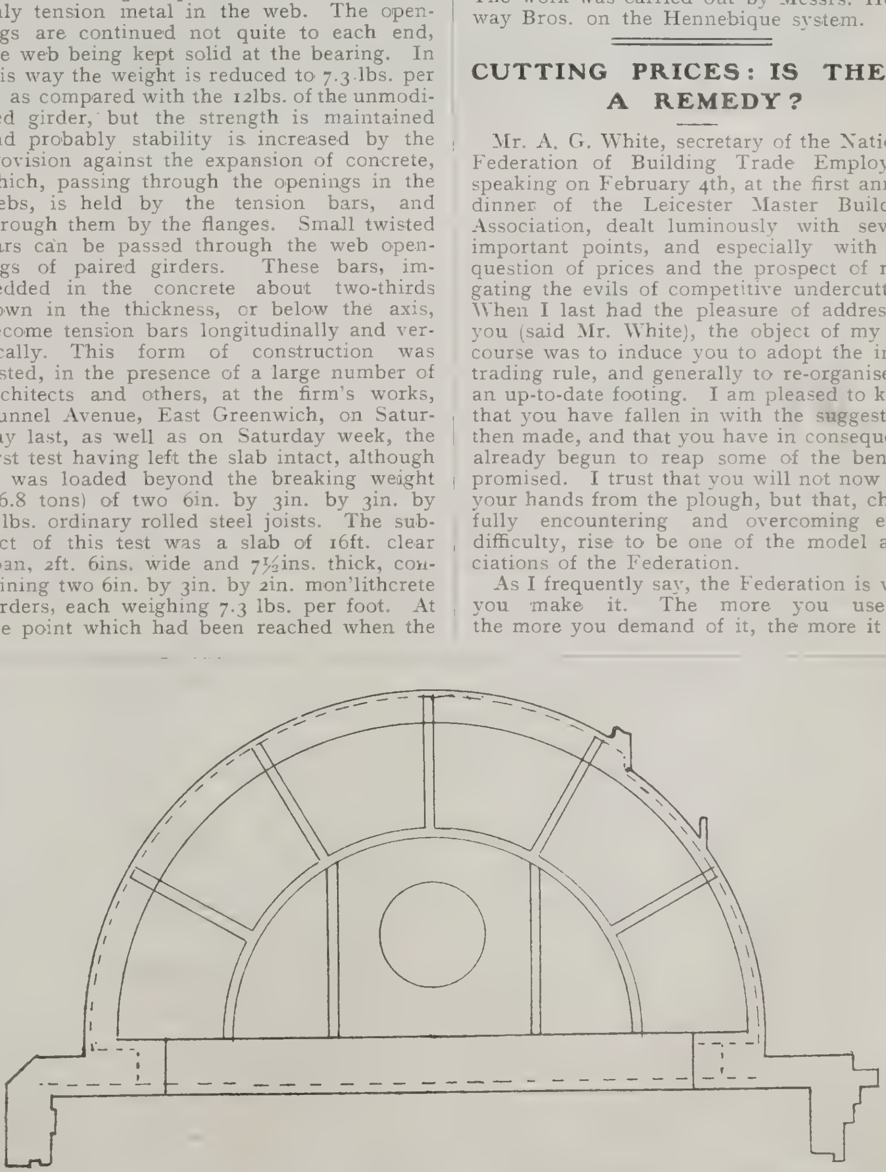
EXTENSIONS AT THE BOROUGH POLYTECHNIC.

The floors, columns, staircase, and roof of this building were constructed entirely in ferro-concrete, the chief feature being the roof, which is flat and of a span of 40ft., in the clear, and 32ft. above the floor immediately below same, the main beams being only 20ins. deep over all, including the 4ins. thickness of ferro-concrete roof. The roof is panelled, as is seen in the illustration, by means of secondary beams of the same depth as the main beams. The stage, which is semi-circular in plan, is also constructed in ferro-concrete, and has a roof over, which is conical in elevation. A special arrangement of girders was therefore necessitated, and a straight horizontal girder was provided to take the ends of a semi-circular horizontal girder, the latter being supported at intermediate points on three arched ribs as shown, two of these ribs being carried through the semi-circular girder to the straight one. Owing to the height of the roof, special scaffolding was necessitated. The work was carried out by Messrs. Holloway Bros. on the Hennebique system.

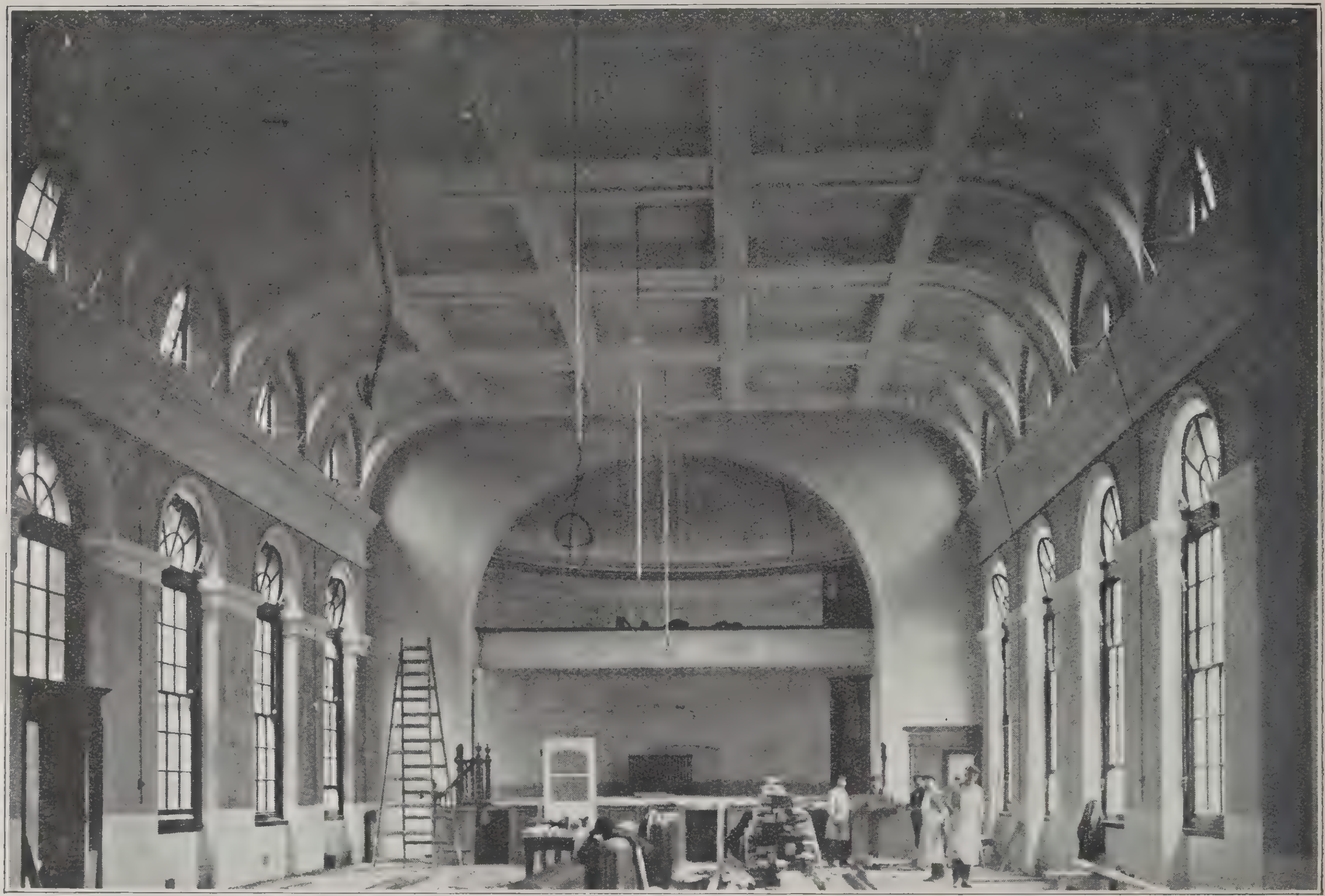
CUTTING PRICES: IS THERE A REMEDY?

Mr. A. G. White, secretary of the National Federation of Building Trade Employers, speaking on February 4th, at the first annual dinner of the Leicester Master Builders' Association, dealt luminously with several important points, and especially with the question of prices and the prospect of mitigating the evils of competitive undercutting. When I last had the pleasure of addressing you (said Mr. White), the object of my discourse was to induce you to adopt the inter-trading rule, and generally to re-organise on an up-to-date footing. I am pleased to know that you have fallen in with the suggestions then made, and that you have in consequence already begun to reap some of the benefits promised. I trust that you will not now take your hands from the plough, but that, cheerfully encountering and overcoming every difficulty, rise to be one of the model associations of the Federation.

As I frequently say, the Federation is what you make it. The more you use it, the more you demand of it, the more it will



EXTENSIONS AT THE BOROUGH POLYTECHNIC. DIAGRAM OF GIRDER ARRANGEMENT.



HALL IN THE BOROUGH POLYTECHNIC INSTITUTE. ROWLAND PLUMBE, ARCHITECT.
Reinforced Concrete. Holloway Bros. (London), Ltd.

respond to your desires. But please understand that the motive force must, broadly speaking, come from yourselves; the Federation is merely the instrument. It is your wishes, your support, your individual sacrifices in the cause of combination, which must direct that instrument.

I saw a quotation in a daily paper this morning which struck me as applicable to builders, although it was used in a national sense, because the greater includes the less, and what is true of the nation is true of the industries and individuals of a nation. The quotation ran: "For peoples, the right to live is measured by the sum of the individual sacrifices to which each nation is willing to consent." I think you will agree with me that a similar statement would be true of an industry such as ours. There was a time when this land of ours was the haunt of wild beasts and savages; it is now the home of a mighty nation. That progress has been due to combination, co-operation, and to the individual sacrifices to which our forefathers have been willing to consent to secure that co-operation.

It is in this spirit that we must continue if our industry is to be maintained and to flourish. In the main, competition is a good thing and a law of life; but since there is nothing perfect, it brings with it severities and oppressions which at times seem to stultify its benefits. This is Nature's way of improving her children—by putting pressure upon them to improve their methods, to extend and perfect their combinations so as to rectify the evils while retaining the good.

At the present time, these evils, I fear, rather tend to predominate, and many are seeking a remedy. This feeling came out rather unexpectedly at our annual meeting the other day, when Mr. Lever wanted to know whether something could not be done to put a stop to the excessive cutting of prices which prevails, and said he thought something might be done if we would but try. Mr. Lever was somewhat ironically invited to propound a scheme, while some said it was impossible, and some said: "Get all the builders to join first," and so on. Mr. Lever did not, however, make known to the meeting his full thoughts. I think he was a little disconcerted by the mood of the meeting; but in conversation later, I found that there was some sound sense in what he had in mind. He did not mean to suggest, as probably many thought, a trust or combine, to raise prices after the American style, but rather he wished to bring about a body of opinion or conviction as to what was and what was not a reasonable price for work in any given state of trade. He wished to create a general opinion throughout the trade that the cutting of prices is mostly unnecessary, and he thinks that, once such an opinion is general and strong, the trade will itself take action. He thinks that builders who hold aloof from us do so mainly because they do not see any tangible advantage to be gained by coming into an organisation which allows its members to cut one another's throats, as it were, in competing for work; also, that a good deal of the cutting is due to sheer ignorance of what is a fair price.

Now, I think that an illustration of what appears to take place in another industry may show us that Mr. Lever has some grounds for his belief. Take the coal trade, for example. At certain changes of season, or during severe climatic conditions, or other circumstances affecting the consumption or supply of coal, an announcement is made in various large centres that it has been decided to advance or reduce the price of coal so much per ton. What is the effect of such an announcement? Well! the consumer looks to his stock and estimates the probability of a further rise or fall, and decides on his judgment whether to buy at once or wait and chance it. The merchant presumably does the same, but in addition, he posts up the announced prices, or something very near them, because he knows that the public mind has been prepared by the announcement to pay such prices. In a word, a price has been, or prices have been, suggested to the public.

Sometimes the public judges that the rise is going to be followed by further rises, due to scarcity or other causes, and promptly rushes in to cover its shortage. Sometimes the public judges that prices have reached so low a level that it is wise to buy largely for stock. Whichever way it is, the point to note is the effect that a suggestion, authoritatively announced, has upon both the buyer and seller.

What, I take it, Mr. Lever wants to bring about, is something like that. I don't see any impossibility about achieving such a result—it is a matter of ingenuity and individual sacrifice. For example, suppose an investor is looking for a remunerative and safe investment. He can find out easily enough what are the prices of Consols, Bonds, railway, and other industrial stocks and shares; but what can he find out about land buildings? Very little, I imagine, and that with difficulty; and yet there is no more stable kind of investment. How is he to have advertised daily, or at short intervals, information as to what certain kinds of buildings can be built for, and what revenue they may be expected to yield? I know of no ready means of ascertaining this.

And yet there would be no difficulty for committees of experts, composed of builders, architects, and surveyors, to produce and publish information of this kind—information which would show that the price of buildings of a given class was so and so, and that the price as compared with previous reports was rising or falling, and that the rental values of such classes of buildings was about so and so, and rising or falling. Such information, it seems to me, would act and react on the minds of the public, and all the producers too in a somewhat similar way to what announced changes of price do in the coal trade.

I understand that Mr. Lever intends to have this matter further considered by his local association, and it will be interesting to hear the result. Perhaps you, too, will give this most important question your careful consideration.

Proposed New Works.

ABERDEEN.—The directors of the Royal Infirmary propose to spend Lord Mountstephen's gift of £26,758, received last May, in various alterations and extensions. These works comprise:—The erection of three operating theatres, with surgeon's room, anæsthetic and sterilising rooms to each; a new out-patients' department on Sim's Square; a reconstruction of the surgical block to provide an electrical department in the basement; improvements to the gynæcological and ophthalmic departments; and increased accommodation for the medical and nursing staffs.

BOURNEMOUTH.—The Town Council has passed plans for the following works:—Three houses and shops, corner Gervis Place and Westover Road, Messrs. Aldridge and Haydon; new exit, Boscombe Hippodrome, Messrs. Mouillott and De Frece; shop, corner Gervis Place and Westover Road, Messrs. Aldridge and Haydon; pair houses, Firbank Road, Mr. J. Flower; house, site 146, Grand Avenue, Mr. F. Cole; three houses, Castlemain Road, Mr. T. Cole; houses, 23, St. Anthony Road, Capt. MacDonald; house, 70, Fenton Road, Mr. W. H. Haysom; house, Belle Vue Road, Mr. W. Shave; house, 70, Muccleshell Road, Mr. W. Light; house, 5, St. Augustine's Road, Messrs. Jenkins and Sons; three houses, 47, 48, and 49, Madison Avenue, Messrs. Wallace Jones and Sons; house, 148, St. John's Road, Mr. R. B. Parkes; house, 71p, Easter Road, Mr. W. Warr; two houses, Lowther Road, Messrs. Davis and Lambert; two houses, Edge Hill Road, Mr. S. Harris; pair houses, corner Amesbury and Beaufort Roads, Mr. J. Francis; house, 8, Green Road, Mr. T. Cole; two houses, 330, and 331, Green Road, Mr. H. Snook; two houses, King's Park Avenue, Mr. G. Dolman; house, 28, Kimberley Road, Mr. F. Tilbury; house, 133, King's Park Avenue, Mr. G. W. Meadus; house, 20, Queen's Park South Drive, Mr. J. Flower; house, site, Lowther Road, Messrs. Miller and Sons; house, Stourcliff Avenue, Mr. A. Cook; house, 17, Foxholes Road, Mr. W. Bullen; two houses, Maxwell Road, Mr. A. T. Montague; two houses, The Avenue, Stourwood Estate, Mr. R. Holly; house, Muccleshell Road, Mr. J. Wilson; alterations, The Central Hotel, Richmond Hill, The Royal London Mutual Insurance Society, Ltd.; house, 31, Heathwood Road, Mr. F. Brewer; two houses, 48 and 49, Guildhill Road, Mr. S. Harris.

BRIDGE-OF-WEIR, SCOTLAND. — The parish church is to be extended at a cost of £1,100. About £820 of this is in hand.

COVENTRY.—The City Council has passed plans for the following:—Four houses, Oliver Street, for Mr. C. A. Newbold; rebuilding of factory, Lower Ford Street, for Mr. T. F. Jackson; eight houses, Marlborough Road, for Mr. C. Blockley; 27 houses, Chandos Street and Clements Street, for Mr. W. Wincott; one house, Chapel Lane, for Mr. E. Kelley; ten houses, Adderley Street, for Mr. T. Rogers; twelve houses, Northfield Road, for Mr. J. Cranston; two houses, Broomfield Road, for Mr. E. Twigg; hardening shop, Mile Lane, for the Swift Motor Co., Ltd.; 28 houses, Broomfield Road, for Mr. E. Twigg; seventeen houses, Carmelite Road, for Mr. J. Gardner; thirteen houses, Walsgrave Road, for Messrs. Brookfield and Stratton's factory, White Friars Street, for Mr. D. Payne

DUNDEE.—The Dundee Library Management Committee are considering the plans prepared by Mr. Thomson for the proposed central reading-room at the corner of Barrack Street and Ward Road.

EASTLEIGH, HANTS.—The Hants County Council have agreed to erect a new school at Derby Road, Eastleigh, to cost £11,169.

ELLAND, YORKSHIRE.—It is proposed to erect a new secondary school here, and the County Council are applying to the L.G. Board for a loan for this purpose. The Halifax Architectural Society have offered assistance in drawing up conditions for a competition.

GIRVAN, SCOTLAND.—Mr. John M'Master, of Canterbury, has offered to erect a new Town Hall here, his native town. Plans have been prepared by Mr. W. J. Jennings, of Canterbury, for a building of three floors, the basement containing cloakrooms, kitchen, etc., on the ground floor a police court, committee rooms, and a small hall to seat 246 people, while on the first floor will be the council chamber and principal hall, the latter accommodating between 750 and 1,000 people. The building will be of stone in Early Renaissance style. Mr. M'Masters' offer has been accepted by the ratepayers and the Council has provided the site.

GRIMSBY.—The Finance Committee of the Corporation have approved a Town Hall extension scheme to cost about £30,000. The plans provide for the erection of police, admiralty, arbitration, county, and coroner's courts, and new suites of offices for all the corporate departments, as well as an art gallery and an assembly hall, capable of holding nearly 3,000 people.

HALIFAX.—The new church of St. Paul, King Cross, will cost £14,000 or £15,000. Towards this there is a sum of £4,500 in hand, but other donations or bequests already promised will bring the fund up to £10,000.

HASTINGS.—The Town Council has passed plans for the following works:—New store at the Tramway Power Station, Parker Road, The Hastings Tramway Company; new slaughter-house at Brickyard, near Sedlescombe Road North, Mr. John Whatman, owner, per Mr. Henry Ransom; two dwelling houses, Hurrell Road, Mr. A. H. Cramp, owner and builder; additions at "Harold Laundry," 309, Harold Road, Mr. A. E. King, owner, Mr. A. Midmer, builder.

HERNE BAY—The U.D. Council have passed plans for the following:—Motor garage, King's Road, for Mr. Victor Roi; house, Western Esplanade, on plots 1045 and 1046, for Mr. A. Mann Hawkes; and a house on King's Road for Mr. Joseph Rowden.

INVERARY.—The Town Council are considering the repair and extension of the stone pier at a cost of over £6,000. A structural engineer is to be consulted as to the preparation of plans and specification.

NICE.—A monument to the late Queen Victoria is to be erected on the Boulevard de Cimiez. Mdme. Raynaud, the owner of the villa at which the late Queen used to reside, has given the ground; the Municipality have voted £800, and public subscription has furnished a further sum of £1,000.

OSWALDTHISTLE, YORKSHIRE.—New Primitive Methodist schools are to be built here, and funds are being collected for the purpose.

PERTH.—The directors of the infirmary have secured a site for the new buildings at Tullylumb. It is proposed to spend £40,000 on the new infirmary, which is to contain 100 beds, and of this sum about £10,400 is still required.

POOLE.—The Town Council has passed plans for the following works:—C. Goater, for C. R. Welch, house, Spur Hill Avenue; W. E. Greenham, pair of semi-detached houses, Sunnyside Road; Blachford Bros., for Mrs. Reeves, house in Birchwood Road, Parkstone; Jones and Seward, two detached houses, Princess Road; W. T. Cross, house, Sandbanks Road; W. Southgate, dwelling house, The Avenue, Branksome Park; H. F. T. Barnes, for Burt and Vick, three shops, High Street, Longfleet; Charles T. Miles, for Miss Rudd, house, Canford Cliffs.

PORTSLADE, SUSSEX.—The local authority is considering the question of erecting a town hall and fire brigade headquarters.

RICHMOND.—The L.G. Board has held an inquiry into the application of the Richmond Corporation for leave to borrow £7,300 for the extension of the municipal buildings.

SANDRINGHAM.—The royal residence here is to be enlarged by the addition of a storey to one of the wings, the increased number of guests whom their majesties command to Sandringham having led to increased requirements for sleeping accommodation.

SHEFFIELD: WOODSEATS.—A new Baptist church is to be erected here, of which the school buildings are to be erected first. The latter will contain a lecture hall to seat 450 people, and the estimated cost is £1,500.

SUNDERLAND.—The Corporation Building Committee has approved of plans for the following work:—Hugh Hedley for Stephen Stonley, three houses, Markham Street and Balmoral Terrace; Joseph Potts and Sons for W. H. Swan, four houses, Cooper Street; Joseph Carter, house, Beechwood Street; Geo. T. Brown, additions to the Infirmary by enlarging the outpatients' building.

SWANSEA.—The L.G. Board have sanctioned the building of ten houses in Llangyfelach Road, and have advised the Corporation to invite tenders for their construction with concrete blocks, with alternative prices for brickwork. Since the Board's sanction of the concrete block cottages, a new regulation has been issued requiring 10in. blocks, and under these circumstances it is possible that brick walls would be as cheap as the concrete blocks.

TENTERDEN, KENT.—The Town Council are considering the erection of a new town hall at a cost of about £1,500.

TIBSHELF, DERBYSHIRE. — The parish church is to be extended at an estimated cost of £2,500. Mr. H. P. Currey, of Derby, is the architect entrusted with the plans.

TYSELEY, NEAR BIRMINGHAM.—A new Primitive Methodist church, Sunday schools, and institute, are to be built here at a cost of £8,000.

WIGAN.—Public notice has been given of the intention of the educational authority to erect a school on the site in Scot Lane, Newtown.

WINCHESTER.—The Hants County Council are about to erect new additional offices on the site of No. 2, St. James's Street, at a cost not exceeding £18,000.

WREXHAM.—The Vicar of Wrexham, the Rev. D. Davies, announces that a generous churchman, who does not wish his name to be divulged, has offered to build a new church at Hightown, one of the populous suburbs of the borough, at his own expense. The vicar appeals to the general body of the church people of Wrexham for £3,000 for other church purposes, including the erection of a school church in the Smithfield district, another populous part of the borough, during the present year.

Works in Progress and Completed.

ABERYSTWYTH.—Eighteen workmen's cottages are being erected by the corporation in Skinner Street and Poplar Row at a cost of £2,300.

AYR.—The reparation of the Auld Brig is proceeding gradually. Mr. W. S. Wilson, the engineer, states that the work has been retarded by floods, but no damage has resulted to the structure. The north and south abutments are being underpinned, and three of the arches have been grouted up. Mr. James A. Morris, the architect, states that the reparation of the surface stonework is proceeding satisfactorily. The expenditure to date is £6,500.

BEAFORD, DEVON.—A new tower for the Parish Church is being erected at a cost of £550, and a new vestry is also being added at the east end. Mr. Harbottle Reed, of Exeter, is the architect, and the builders are Messrs. Squires and Son, of Roborough.

BLACKWELL, DARLINGTON.—A new United Methodist Church is being erected here at a cost of £4,500.

DUMBRECK, SCOTLAND.—The new Steven Memorial Church, to seat 750, has been erected at a cost of £6,000. Mr. W. F. M'Gibbon, F.R.I.B.A., of Glasgow, is the architect.

LONDON, E.C.—The memorial to the late Sir W. H. Russell, the famous war correspondent, in the crypt of St. Paul's Cathedral, was unveiled on the 9th inst. The memorial, which consists of bust in bronze surmounting a tablet with inscription, is the work of Mr. Bertram Mackennal, A.R.A.

LUTON.—The opening ceremony of Wellington Street Baptist Schools and Institute took place on Wednesday, the 10th inst. The contract has been carried out by Messrs. T. and E. Neville, of 30, Castle Street, Luton, and amounted to £5,000. The architects are Messrs. George Baines and Son, 5, Clements Inn, Strand, London, W.C.

MACCLESFIELD.—A new high school for girls has been erected here by the Cheshire County Council. The building, which will accommodate 250 scholars, has cost more than £14,000.

MALLAIG, SCOTLAND.—A new Carnegie reading room and library is being erected here. Tenders were accepted from Mr. D. MacColl, Fort William (mason), Mr. A. Maclean, Mallaig (joiner, carpenter, glazier, and painter work), Mr. Frazer, Fort William (slater work).

MANCHESTER.—A new branch mission-room (to be known as the Joynson Memorial), is being erected in connection with St. Phillip's Church, Bradford Road. The church, which will seat about 400 people, will cost about £1,650. Messrs. Potts, Son and Hennings, of Manchester, are the architects.

MOSELEY, BIRMINGHAM.—The reparation of the Parish Church, under the supervision of Messrs. J. Chatwin and Sons, is to be commenced immediately. The tender of Messrs. Godfrey and Collins, amounting to £6,782, has been accepted.

NEWPORT, MON.—A start has been made upon the borough technical schools in Clarence Place. Mr. W. E. Blake is the contractor. The Great Western Railway extensions and improvements are proceeding. The blasting operations in connection with the new tunnel works now resemble a daily bombardment. The company has in contemplation the erection of a large new bridge over the River Usk in connection with the projected new station, which is badly needed. Many hundreds of new houses are being erected in the western valleys of Monmouthshire in anticipation of the demand for houses occasioned by the sinking of new collieries in this district. The new Savoy Hotel and Restaurant at Newport is approaching completion, and is regarded, locally, as equal to anything in London. The keynote is stated to be durability, both inside and outside. Mr. William Gardner is the architect, and Councillor W. A. Linton is the contractor.

OLDHAM.—A triptych with paintings upon oak panels in the sanctuary of St. Mary's Church, Oldham, was dedicated last week. The subject of the paintings is taken from the 1st chapter Revelations, and represents "Our Lord seated upon a throne of gold, in the midst of seven golden candlesticks, and having seven stars in his right hand." On either side are kneeling figures of the Virgin Mary and St. John Baptist; the four archangels, with a host of angels playing musical instruments surround the Throne. Below are groups of figures representative of the church's history, from the Old Testament prophets down to more recent times, and include many authentic portraits, among whom are Archbishop Laud, Bishop Andrews, Lightfoot, and Patterson, with Doctors Pusey and Keble. The paintings, which contain upwards of seventy figures, are by Mr. E. Stanley Watkins, of Ealing.

ROSYTH, SCOTLAND.—Messrs. Gibb, Easton, and Co., who have secured the contract for the new naval base, will commence work immediately. The contract amounts to about £3,250,000, and will occupy about seven years.

SCARBOROUGH.—It is proposed to convert the Salisbury Hotel into a music hall to seat 2,077. The new place of amusement, which is to be on a palatial scale, is to be ready for opening about the first week in August.

SOUTHGATE, MIDDLESEX. — The County Council has accepted a tender for £13,493, for the erection of a county school here.

SOUTHPORT.—The ratepayers and the Town Council are discussing the proposed erection of a public hall to seat 4,000 people. Various schemes embodying a market, concert hall, roof garden, shops, and other attractions have been mooted.

STANLEY, WAKEFIELD.—A new elementary school has been opened here. It provides accommodation for 420 children, has cost £4,336, inclusive of £327 for the site; and has been erected from the designs of Mr. J. Lane Fox, of Leeds and Dewsbury.

SUMMERTON, IBROX.—A new public school has been opened here. The buildings of red sandstone, include ten classrooms, two central halls (one for mentally and one for physically defective scholars), a dining hall, kitchen, rooms for teaching household management, and rooms for teachers, the doctor, and a nurse. A committee room for ladies, and a laundry in the basement are also provided. Mr. Preston, master of works to the Govan School Board, was the architect; Mr. John Baird the measurer; and Mr. John Rodie the clerk of the works. The cost of the buildings was £11,600.

SWANSEA.—Extensive works for Messrs. Baldwin and Co., Ltd., tinplate steel workers, etc., will be commenced immediately. The cost of the new works and blast furnaces is estimated to be about £200,000.

WAKEFIELD.—A new provided school has been opened at Stanley Grove. The buildings have cost £4,440, and comprise a central hall 62ft. 6in. by 26ft., with four classrooms, giving accommodation for 240 children. Space is allowed for three further classrooms, bringing up the accommodation to 420; the central hall, cloakrooms, etc., having been built on a scale commensurate with the complete scheme.

TESTS WITH FIRE-RESISTING DOORS.

Since our previous issue of the fire section the British Fire Prevention Committee has been undertaking two tests with doors to large 7ft. openings, one test being with an "armoured" wood door, and the other with a roller shutter door of American origin. Both tests were for a duration of 2½ hours, at temperatures reaching above 1,800 degrees Fahr., and were followed by the application of water from a steam fire engine. Official reports will be shortly issued in respect to these tests. We are informed that a number of doors will be before the committee for investigation this month, amongst them being two further "armoured" doors, two metal doors, two composite doors, and some rolling shutter doors; in fact, the number of doors and shutters put forward for investigation at the moment is quite considerable, the subject being of immediate practical interest, having regard to the necessity of having reliable data in respect to doors intended to close large openings in buildings of great cubical extent. The tests with doors have been heretofore conducted in one of the committee's testing chambers only, but since November two chambers have been in operation, and we now understand that a third testing chamber is to be adapted for door tests to meet with the pressing requirements regarding this class of investigation.

It is understood that a table, giving the precise facts summarised from the official reports, is to be issued; and as the investigations already include about forty doors, this summary of the work should be a valuable guide to this class of work.

Federation News.

SOUTH SHIELDS ASSOCIATION.

Secretary: J. G. Robertson.

The South Shields branch followed up most energetically the remarks of the Official Receiver (Mr. T. Gourlay), with respect to forms of contract that he made in the Newcastle Bankruptcy Court. (See "Builders' Journal," p. 48, January 20th.) Special attention has been given to the matter in the local Press. The difficulties that contractors have had to contend with have, as a result of the publicity given to the matter, been brought home to the public as never before.

BIRMINGHAM ASSOCIATION.

Secretary: E. J. Bigwood, J.P.

A meeting of the committee of the Birmingham Building Trades Employers' Association was held at 17 and 19, Colmore Row, Birmingham, on Monday, January 18th, at 2.45 p.m., Mr. F. G. Whittall (president) being in the chair. There were thirteen other members present.

The proposed new rules of the association, as drafted by the sub-committee, were considered, and with a few alterations were approved for presentation to a general meeting.

The attention of the committee was drawn to the terms of an advertisement now appearing with reference to tenders for the erection of the Rednal reading-room by the King's Norton District Council. The advertisement required a deposit of one guinea, which would be returned on receipt of a bona-fide tender, and all documents issued to the contractor. The secretary was instructed to write to the surveyor to the council pointing out that this requirement was unusual, and that the committee of this association took the strongest objection to it, and hoped that the council would see their way to omit it.

The conciliation boards were appointed to meet the various branches of the operatives to discuss the proposed alterations to the working rules.

A report from Mr. A. G. White (the secretary of the National Federation) on the second annual return of members was read and received.

The president and Mr. J. B. Whitehouse were asked to represent this association at the annual meeting of the National Federation.

Two new members were elected, viz., Mr. F. H. Smith, 418-420, Moseley Road, and Messrs. Richard S. Moore and Co., Green Street.

The general meeting of members was held at the Building Trades' Exchange, Cannon Street, on Thursday, January 28th, Mr. F. G. Whittall presiding. There was a good attendance. The new rules were approved and ordered to be printed and circulated among the members. These rules include the inter-trading rule, which was adopted at the annual meeting in November last. The business closed with a vote of thanks to the Building Trades' Exchange for the use of the room for the meeting.

BROMSGROVE AND DISTRICT ASSOCIATION.

Secretary: Sydney J. Brazier.

The annual meeting of the Bromsgrove and District Association was held on Saturday, January 16th, Mr. Wm. Weaver presiding, with Mr. D. Edwards in the vice-chair.

The secretary read a report of the work of the association during the past year, and presented a statement of accounts; both were unanimously adopted. The report showed a membership of 18, as against 17 at the corresponding period of last year. The statement of account showed a satisfactory financial condition. It was decided to hold the annual dinner, the arrangements for which were left in the hands of a committee.

Mr. D. Edwards was elected president, and Mr. W. J. Tilt vice-president. Votes of thanks were passed to the retiring president and vice-president, and were acknowledged in suitable terms. The treasurer and secretary were re-elected, and votes of thanks accorded them for their services in the past. Two new members were elected. Six orders for the "Builders' Journal" were received.

The first meeting of the recently formed local conciliation board was held on the same evening.

LEICESTER ASSOCIATION.

Secretary: S. A. Dove.

The annual report on the work of the Leicester association records that the stonemasons, plasterers, and plumbers have merged their own associations into that of the master builders to form one powerful organisation. The committee regret they were not successful in carrying their appeal against the operatives' definition of the working rules in respect of the five-mile radius. They persevered at the local conciliation board and the Midland centre, but the verdict was against them at the National conciliation meeting. At the termination of the five years' agreement affecting the boundaries, namely, twelve months hence, the whole question must be effectively dealt with.

New rules governing this association will be taken in hand and completed by the new committee. They are in an advanced state, but have been kept back to wait for the meeting of the National Association.

The attention of the members is called to the advantages of the collective insurance scheme which the Midland Federation has been at considerable trouble in formulating.

The annual general meeting of the Leicester Association was held at the Saracen's Head Hotel, Leicester, on February 4th, when a large number of members attended. All the officers were re-elected as follows:—President, Mr. W. Yates; vice-presidents, Messrs. F Beck and G. Rimmington; hon treasurer, Mr. A. Chambers; secretary, Mr. S. A. Dove, F.C.R.A., Spencer Chambers, Market Place, Leicester; and six representatives, each of bricklayers, carpenters, plumbers, stonemasons, slaters, and plasterers, forming the general council.

The annual report draws attention to the changes in the constitution of the association since the last annual meeting of the Leicester Master Builders' Association. At that time a hope was expressed of a closer connection with the allied trades by means of an affiliation scheme. This hope has now been realised, but in a somewhat different manner from what was foreshadowed. The stonemasons, plasterers, and plumbers have merged their own associations into that of the master builders, to form one powerful organisation. This, conducted with wisdom and care by the officers and committee, and loyally and faithfully supported by the members themselves, should be of great benefit to the trade, and generally tend towards establishing that position and prestige to which such an important industry is entitled.

After the annual report and accounts had been passed, the secretary called the attention of the members present to a minute that was passed on November 11th referring to the question of honorary members, and the preparation of a telephone card on similar lines to other large associations.

Mr. A. G. White, secretary to the National Federation, who was present at the meeting, also emphasised the importance of this, and after a short discussion, it was unanimously resolved that the association do elect honorary members; and a small committee was appointed to publish the telephone card (which is similar to that of Liverpool Association), as early as possible. Votes of thanks to the president and officers concluded the meeting.

The first annual dinner was then held. It proved highly successful, upwards of sixty members attending. Mr. Hassell, president of the Leicester Master Painters Association, Mr. A. G. White (National Federation), Councillor H. Smith, and Mr. F. W. Amphlet (Midland Centre), and Mr. Elder-Duncan (editor "Builders' Journal"), were also present. After the loyal toast had been honoured by the chairman, the toast of the National Federation was replied to by the secretary, Mr. A. G. White, whose important speech appears in another part of the present issue. Mr. Elder-Duncan, in replying to the toast of the "Builders' Journal," thanked all those members who were supporting the Journal. It had been a big undertaking, and had involved a large amount of hard work. The more the members supported it, the better it would become. He referred to complaints of the monthly reports being in small type, and said it was proposed to change the type immediately to that used for the rest of the paper. It was also decided to devote special attention to all departments of the building trade, so as to make it thoroughly a "Builders' Journal." Councillor H. Smith, president to the Midland Centre, replied to the toast of "The Midland Centre." Mr. Amphlet, secretary to the Midland Centre, proposed the toast of the evening, "The Leicester and District Building Trades Employers' Association," and expressed his pleasure at seeing this association progressing so favourably and under such good management. "The Visitors" was replied to by Mr. Hassell, president of the Leicester Master Painters' Association.

BRISTOL ASSOCIATION.

Secretary: A. J. Pitt.

The annual meeting of the Bristol Association was held at the offices, Guildhall, Small Street, on Thursday, January 28th, when Mr. F. Chown, vice-president (in the absence of the president, Mr. Frank N. Cowlin, who is at present in Jamaica) presided.

The anual report, of which the following is an abstract, was presented, and, upon the motion of the chairman, seconded by Mr. W. Foster, was approved and ordered to be printed and circulated amongst the members:—

In the case of the contracts which have been let, it is a matter for regret that, in consequence of the very keen competition, prices have been far from remunerative. Indeed, it may be said in more than one instance that it has only meant that the contractor has been able to keep his machinery and plant employed.

Representations having been made by the Plasterers' Society asking that the fixing of substitutes for plastering might be recognised as plasterers' work, seeing that it was taking the place, to a great extent, of lath and plaster, a conference was held between the committee of the association and representatives of the society, when, after hearing the opinion of the men, the masters upheld their views, and it was resolved to add to the plasterers' schedule of work:—"Plastering in any material or any substitute for plastering, including lathing and all works in connection therewith."

The fair-wages clause in the corporation form of contract was the subject of negotiations between the association and the corporation, and the matter was settled as reported on p. 468 of our issue of December 9th, 1908.

The efforts made by the educational authorities of this city to secure a university for Bristol, will, it is to be hoped, in the near future be crowned with success, and, with a view to rendering all the support possible, the committee passed a resolution strongly endorsing the scheme, and this has been lodged with the authorities in whose hands the granting of the charter rests.

The question of floor and wall tiles was raised early in the year by the bricklayers' society, who desired that this work might be recognised as bricklayers' work, but to this the association took exception, as this had always been done either by plasterers or bricklayers, whichever happened to be most convenient to the builder. Eventually it was agreed between all parties to allow the fixing of wall and floor tiles to remain optional.

It is noted that arrangements have been made during the year by the National Federation with the proprietors of the "Builders' Journal," whereby that publication has become the official organ of the Federation, and the committee express the hope that every member of the association will support this movement and assist in making the journal a complete success, and of benefit to the Federation.

The association deplore the loss by death of three members during the year, viz., Mr. H. A. Forse, Mr. William Church, and Mr. T. Broad, all of whom, during their lifetime took an active interest in the work of the association.

Mr. George Humphreys, hon. treasurer, submitted his accounts for the past year, which were approved and adopted, upon the proposition of Mr. E. I. Neale, seconded by Mr. G. L. Poole, the former remarking that, in his opinion, the financial position of the association was most satisfactory, considering the exceptional depression through which the building trade was then passing.

Mr. Frank N. Cowlin was re-elected president, Mr. F. Chown vice-president, and Mr. George Humphreys hon. treasurer.

Upon a ballot being taken, the following were declared to constitute the committee for the coming year:—Messrs. E. I. Neale, J. Lovell, W. Foster, E. Walters, R. F. Ridd, A. Dowling, A. Perkins, and F. A. R. Woodward.

It was decided to defer the annual banquet of the association until March, in order that the president might be with them, and to leave the various arrangements in the hands of the committee.

A discussion upon general matters appertaining to the trade, closed the meeting.

BATH ASSOCIATION.

Secretary: E. J. B. Mercer.

The last general meeting, in November last, was adjourned until December 16th, in the hope that the president, Mr. J. W. Knight, J.P., Mayor of Bath (who has been laid up with a severe illness), might be able to attend. Although he is happily much better, he was not well enough to attend the adjourned meeting, at which Mr. Councillor A. W. Wills was voted to the chair. A letter from the Town Clerk was read to the effect that the various Corporation Committees had adopted the recommendation of this Association for the shortening of working hours during the winter months.

Names of representative delegates from the bricklayers', masons' and carpenters' and joiners union to serve on the local conciliation board were received. A small dispute in the painting trade was reported as being amicably settled.

A slight alteration of rules, to enable meetings to be held prior to the meetings of the Federation, was agreed to.

This concluded the business of the adjourned meeting.

The annual general meeting of the Bath Association was held at the conclusion of the business transacted at the adjourned meeting. In the absence of the president, Mr. Councillor Wills was voted to the chair. The minutes of the last annual meeting were read and confiermed.

The five retiring members to serve on the Executive Committee of the South Wales Federation, viz., Messrs. Ambrose, Blackmore, Erwood, G. J. Long, and Geo. Hayward, were re-elected.

The hon. treasurer presented a rough statement of accounts previous to auditing, which were considered satisfactory.

By the unanimous vote of those present, Mr. Frank B. Parsons (of Howard, Sons, and Parsons, Ltd), vice-president, was elected president for this year, upon which he was inducted in the chair and invested with the gold badge of his office.

Mr. George Hayward (Hayward and Wooster), president of the South-Western

Federation, was then elected vice-president. Mr. Councillor Sydenham and Mr. Edw. J. B. Mercer were then re-elected as hon. treasurer and secretary respectively, the latter for the 20th time.

A hearty vote of thanks was accorded to the retiring president for his services during the past year, with best wishes for his speedy restoration to health.

On a ballot for the committee, Messrs. F. Chancellor, S. Ambrose, W. Morris, and H. Knight were elected.

The auditors were re-elected.

The question of the annual dinner, which has been held for seventeen years, was then considered, and it was resolved that, in consequence of the depression in the building trade and the general distress amongst the working classes, this function should remain in abeyance for the present year.

MIDDLESBROUGH ASSOCIATION.

Secretary: Walter Rigby.

The monthly general meeting of the Middlesbrough Association was held in the Grand Hotel, on Wednesday evening, January 20th. The president (Mr. W. Masters) presided over a record attendance.

It was unanimously decided that the president attend the National Federation meetings as representing this association.

The motion to rescind a previous resolution of the Federation, prohibiting the sale of the National form of contract agreement to non-federated builders, was heartily approved. It was strongly expressed that an increased use of this agreement by all builders, whether federated or not, would be of great benefit to the Federation and the building trade generally. A very interesting report from the National secretary in reference to the annual return of members, and the very small proportion of apprentices to the number of men employed in the building trades, was read. It was felt that this return of members had served a very useful purpose in calling the attention of builders generally to the position of the trades in reference to apprentices.

The Vice-President (Mr. W. S. Davison) called attention to the special terms to subscribers to the journal through an association, and spoke highly of the value of the paper—educationally and generally—to builders. Other members followed, and several new subscribers were obtained. It was also decided that the secretary be provided with a weekly copy at the expense of the association.

In connection with this association, a smoking concert was held at the close of the general meeting, the president occupying the chair.

SUNDERLAND AND DISTRICT CONCILIATION BOARD FOR THE BUILDING TRADES.

A meeting of the Sunderland and District Conciliation Board for the Building Trades was held at Sunderland on Wednesday, January 20th, at eight o'clock in the evening.

Arising out of the minutes of the annual meeting, held on July 16th, 1908, was a matter with respect to bringing in the trades who were not represented upon the Board. It was explained that this had received the attention of the National Board quite recently, and efforts had been made to get the other trades to join. With the exception of the labourers' organisation, which was too complicated to be admitted, they were unwilling to join. The local Conciliation Board was therefore powerless to move in the matter.

The chairman (Councillor George Swan) called upon the operative stonemasons to state the complaint which had caused the Conciliation Board to be called together. Mr. W. Williams (London), the assistant general secretary of the Operative Stonemasons' Society, stated that two members of the employers' association had been importing dressed stone into the district governed by the working rules, in direct violation of Rule 5, which reads as follows:—"That no worked stone be allowed to come into the town or vicinity except tooled paving, landings, and steps, imported stone sawn on two sides, water tabling sawn on four sides, balusters and finial not exceeding seven inches in diameter be allowed." He said that if the employers desired an alteration of the rule, proper notice should be given.

In reply, Mr. J. W. White stated that at the present time very keen competition existed between the local master stonemasons and the quarries. Local contractors, in order to secure contracts, had in these instances accepted the quarry prices, which had resulted in the breach of rule complained of. There was no desire on the part of the employers to have the rule altered, as they wished to keep the work in the town as much as possible. The Conciliation Board should say definitely that all the trades, in a case of a violation of the working rules, should co-operate in securing that the rule be carried out. Owing to the fact that no local stonemasons were on the jobs referred to, the stonemasons were not in a position to force observance of the rule.

Mr. R. Baxter stated that they had no wish to penalise the employers, who had been led into a breach of the rule by force of circumstances, but they required a definite assurance that the rules would be observed, and that the trades represented were prepared to give the employers every assistance possible to carry them out.

After considerable discussion, in which many of the members present took part, on the proposition of Mr. W. Williams, seconded by Mr. F. W. Ranken, it was resolved and carried unanimously:—"That in view of the recent breach of Rule 5 of the stonemasons' working rules, and the joint request of the employers and operative stonemasons for an assurance of the trades represented on the Conciliation Board, in the desirable course of maintaining the working rules of the various trades, undertake to obtain from their respective societies such assurance of support of all trades in enforcing observance of the trade working rules, and the employers also give the same pledge to the various trades to enforce them."

Arising out of the resolution, a discussion took place on the fair wages clause in public contracts, which should include the observance of the working rules of the various trades in the district. After further discussion, on the proposition of Mr. J. W. White, seconded by Mr. R. Johnson, it was resolved:—"That joint representation should be made to the public authorities, by both the employers and the operatives, to have a clause inserted in the contract for the due observance of the working rules in force within the district."

Trade and Craft.

The "Cable" System of Heating.

The system of low-pressure hot-water heating invented by Mr. A. H. Barker, B.A., B.Sc., etc., is fully described in a booklet that has been issued by J. F. Phillips and Son, heating engineers, Richmond Buildings, Brighton, and 21, Old Queen Street, Westminster. The apparatus required for this system is known as the "thermo-syphoniser," which automatically heats the water, and powerfully circulates it in any required direction, independently of levels or gradients. As the pipes can be fixed at any level, and bent in any direction, it is obvious that no excavation is required either for pipes or for boiler. There is the same disregard of levels as in fixing electrical cables. "In a six-storey building," for instance, "the boiler, the apparatus, and the whole of the horizontal mains, flow and return, can be fixed on the sixth floor or the roof above it. No horizontal pipes whatever need run through any room, nor need any pipe be fixed in channels nor below the floor." Hence the system is peculiarly applicable to hospital work, for example, where it is specially necessary not to provide the "ideal breeding place for disease-germs" represented by a damp, dirty, warm, and dark pipe channel beneath a hospital floor. The pipes required in this system are, it is claimed, less than half the diameter of those for an ordinary circulating system, and less than those in a low pressure steam system. This use of small and inconspicuous pipes is of both economical and artistic advantage; they not only cost the less, but can, if necessary, be concealed behind skirtings and dado-boards; or, even if they are not hidden, they are unobtrusive. The temperature of the water is under perfect control, and can be regulated from lukewarm to boiling, and it circulates equally well at any temperature, and the apparatus absolutely prevents boiling over of the water. It is fed by a single steam pipe, and may be worked with exhaust steam only. The position of the boiler is immaterial; it may be quite away from the building heated. The apparatus has been successfully installed at a large number of important buildings, including the Brighton Aquarium, asylums at Cardiff, Newport, and Bodmin, many churches, chapels, and schools, at the universities of Leeds and Johannesburg, at several country houses (including Hardwick Hall, the residence of the Duke of Devonshire), and at hotels at home and abroad.

* * *

Messrs. Bassant Bros., parquet flooring makers, etc., 87, Charlotte Street, Fitzroy Square, announce that they have converted their business into a private limited company, which will in future be called Bassant Bros., Ltd. There will be no change in the conduct and management of their business, as the directors of the new company are the present partners, namely, Mr. C. W. Bassant, Mr. B. Bassant, and Mr. L. B. Hills.

Coming Events.

Thursday, February 18.

CONCRETE INSTITUTE.—General meeting. Mr. L. Serraillier, on "Certain Aspects of Reinforced Concrete," 8 p.m.

L.C.C. CENTRAL SCHOOL OF ARTS AND CRAFTS.—Mr. Noel Heaton, B.Sc., F.G.S., on "The Materials of Construction and Decoration," 8.30.

Friday, February 19.

BIRMINGHAM ARCHITECTURAL ASSOCIATION. — Mr. Frank T. Baggalay, F.R.I.B.A., on "Roman Architecture."

INSTITUTION OF MECHANICAL ENGINEERS.—Annual General Meeting, 8 p.m.

ARCHITECTURAL ASSOCIATION.—Mr. A. Needham Wilson, A.R.I.B.A., on "The Press and Architecture," 7.30 p.m.

Monday, February 22.

REGENT'S STREET POLYTECHNIC.—M. A. G. H. Thatcher, on "English Methods of Scaffolding." 8 p.m.

Tuesday, February 23.

SURVEYORS' INSTITUTION.—Annual Dinner Whitehall Rooms, Hotel Metropole, 6.30.

Wednesday, February 24.

GLASGOW INSTITUTE OF ARCHITECTS.—Business Meeting.

Monday, March 1.

LIVERPOOL ARCHITECTURAL SOCIETY.—Mr. E. Guy Dawber, F.R.I.B.A., on "Materials, and their Value in Relation to Domestic Architecture."

Wedneday, March 3.

EDINBURGH ARCHITECTURAL ASSOCIATION.—M. J. B. Dunn, F.R.I.B.A., on "Useful Hints on Gardening," 8 p.m.

Friday, March 5.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—Mr. C. H. Holden, A.R.I.B.A., on "Aboriginality in Architecture."

Wednesday, March 10.

NORTHERN ARCHITECTURAL ASSOCIATION.—Ordinary meeting of Council, 7 p.m.; ordinary meeting and Exhibition of Drawings, 7.30.

Monday, March 15.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.—Mr. Francis S. Swales, on "American Architecture," 8 p.m.

Friday, March 12.

SOUTH-WESTERN POLYTECHNIC INSTITUTE, CHELSEA.—Preentation of Prizes and Certificates by Prof. H. A. Miers, D.Sc., F.R.S., Principal of the University of London, 8 p.m.

PRACTICAL NOTES

FOR

ARCHITECTURAL DRAUGHTSMEN

BY

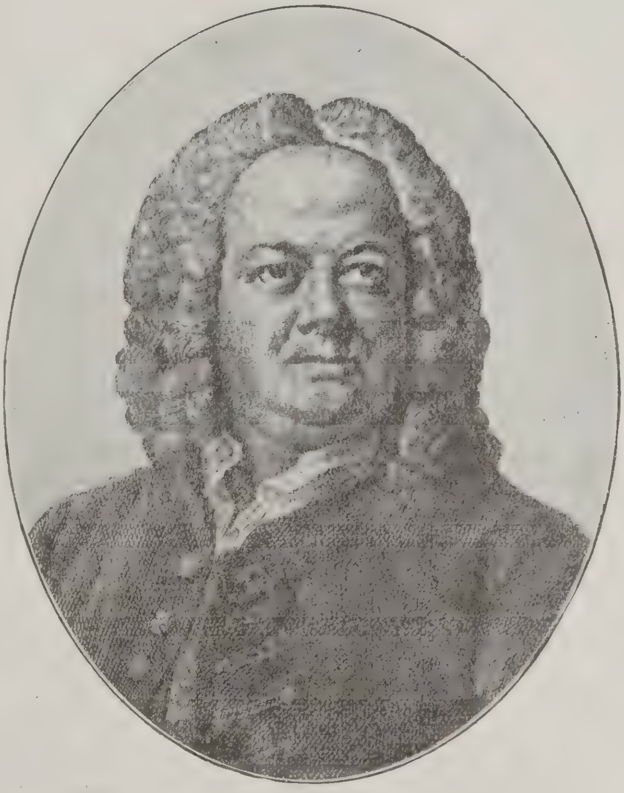
A. W. S. CROSS, M.A., F.R.I.B.A. and A. E. MUNBY, M.A., A.R.I.B.A.

Part 1. The Orders and their Application.

Plate 1. Introduction.
" 2. The Four Orders.
" 3. The Tuscan and Doric Orders in detail.
" 4. The Ionic and Corinthian Orders in detail.
" 5. Details of Imposts and Arch Moulds.
" 6. Order upon Order and Intercolumniation.
" 7. Doorways and Pediments.
" 8. Windows and Entablatures.
" 9. Windows, rusticated treatment.
" 10. Venetian and other Windows.
" 11. Niches and their Treatment.
" 12. Block Cornices, Balusters, Entablatures and Entasis.

Part II. Details of the Orders.

Plate 13. Rules for Setting out the Volutes of the Ionic Capital by (1) Gibbs, and (2) Vignola and Palladio.
Plate 14. Details of Ionic and Corinthian Capitals.
" 15. Examples of Arcading (Ionic and Doric).
" 16. Examples of Arcading (Tuscan and Corinthian).


JAMES GIBBS.

Part III. Constructional Details.

Plate 17. Domes.
" 18. Pendentives, Circular Staircases and Wreathed Columns.
" 19. Gothic Tracery and Vaulting.

Part IV. Perspective.

Plate 20. Notes on Architectural Perspective.
" 21. Setting up a Perspective.

Part V. Shadows.

Plate 22. Explanatory matter regarding the projection of Shadows.
" 23 to 27. Examples illustrating Shadows on various architectural details.

"PRACTICAL NOTES" contains a mass of valuable information which it is essential that the Architect should know to enable him to give that harmony, grace and proportion which exemplified the works of Ancient Greek and Roman Artists, many of which are still the admiration of the whole world. It is invaluable to students preparing for the examinations of the R.I.B.A., showing how to draw The Orders correctly with the smallest possible amount of work and study.

Price for Complete Work, 12/-, including Portfolio.

We shall be pleased to forward a copy of this work on approval to any of our subscribers.

PUBLISHED BY . . .

TECHNICAL JOURNALS, LTD.,
Caxton House, Westminster, London, S.W.

Descriptive Leaflet sent Post Free upon application.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, **BUILDERS' JOURNAL,** *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberporth, Cardiganshire.—For the erection of a pair of houses, for Messrs. Owen and Thomas. James Jones, architect, Dolwen, Rhydlewis:—

R. and B. Jones, L'angranog	£840	0	0
Thomas and Lewis, Newcastle Emlyn	720	0	0
J. Griffith and Co., Rhydlewis	682	0	0
B. Elias, Ponthirwen	656	6	0
J. D. Lloyd, Aberporth	610	0	0
D. K. Davies,* Beulah	599	0	0

*Accepted.

Aberystwyth.—For erection of 18 dwelling-houses, four on the western side of Skinner Street, seven on the eastern side of Skinner Street, seven in Poplar Row and Pound Place, for the Corporation. Mr. Rees Jones, borough surveyor:—

W. R. Jones	£2,928
Evans and Jenkins	2,800
Jones and Lewis	2,520
Owens Bros.	2,502
E. M. Evans and Sons	2,481
J. Owen	2,475
L. Bearne,* Terrace Road, Aberystwyth	2,300
T. Jenkins and Sons†	680
J. Humphreys†	608

† For four houses only on the west side of Skinner Street.

*Accepted.

Belfast.—Accepted for extension of Municipal Technical Institute, Belfast:—
R. Corry, Ltd., University Street, Belfast, £7,990.

Cambridge.—For the extension of Cambridge Post Office. for H.M. Office of Works, etc.:—

W. Bell and Sons	£3,997
H. Smith	3,080
A. Negus and Sons	3,399
Carter and Wright	3,742
W. J. Fryer and Co.*	2,788

*Accepted.

Hucknall Torkard, Notts.—For erection of four shops, High Street, Hucknall, Notts, for Mr. Thos. Metcalf, J.P. Mr. Harry Spencer, architect, Hucknall, Nottingham. Quantities by architect:—

J. Dove	£1,630	0	0
T. Cuthbert	1,540	0	0
Birkin and Rowland	1,425	0	0
D. S. Webster	1,419	0	0
J. A. Munks and Son	1,412	0	0
J. Lewin,* Carlton, Notts	1,378	10	0

*Accepted.

London, N.—For making alterations at 71, High Street, North Finchley, N., for the London and Provincial Bank, Ltd. Mr. V. Vagnolini, architect and surveyor, 33, Stirling Road, Clapham Rise, S.W.:—

H. Groves	£2,185
Rice and Son	2,098
J. Parsons	2,066
A. Fairhead and Son*	2,048

*Accepted.

London, N.W.—For extension and alteration of the Kilburn Grammar School, for the Middlesex County Council. Mr. H. G. Crothall, architect:—

Holloway Bros.	£6,300
F. G. Minter	6,199
Dove Bros.	6,198
J. Dorey and Co., Ltd.	6,169
A. Porter	6,146
Ford and Walton	6,135
G. Neal	5,995
E. Lawrance and Son	5,963
Holliday and Greenwood, Ltd.	5,898
F. and H. Higgs	5,879
Treasure and Son, Ltd.	5,869
H. Knight and Son	5,771
Mattock Bros.	5,739
A. Fairhead and Son	5,698
W. Lawrence and Son*	5,644

*Recommended for acceptance.

London, W.C.—Recommended for acceptance for alterations and additions to St. Clement Danes Vestry Hall, for the Westminster City Council:—
J. R. Sims, 58, 60, Horseferry Road, £1,212.

Portsmouth.—For Infirmary extension, for the Guardians:—

H. Jones	£6,590
Sperring	6,570
A. E. Porter	6,455
Dowdell	6,154
E. W. G. Payne	6,125
Light and Son	5,992
J. Cockerell	5,921
J. Tanner	5,900
M. Coltherup	5,750
F. Corke	5,689
F. J. Privett*	5,267

*Accepted.

Sutton, near Southend-on-Sea.—For erection and completion of new elementary schools for 160 children, for the Rochford District Sub-Committee of the Essex Education Committee. Mr. F. Whitmore, architect, Chelmsford:—

Main Building.

Paren and Son, Erith	£2,000	0	0
Moss, Rayleigh	1,819	6	3
Brown Bros., Grays	1,805	4	3
Davidson, Leigh-on-Sea	1,797	16	7
Jarvis, Brentwood	1,697	0	0
Beaumont, Lexden	1,682	0	0
Ramsbottom and Co., Ilford	1,670	0	0
Dowsing and Davis, Romford	1,650	0	0
Bennett, Ipswich	1,650	0	0
F. and E. Davey, Southend	1,637	0	0
Johnson and Hawkes, Chelmsford	1,633	0	0
Willmott, Ilford	1,632	0	0
E. and B. H. Davey, Southend	1,621	0	0
Pavitt and Son, Aveley	1,587	16	0
Woodhams, Southend	1,570	0	0
Hyde and Co., Norwood	1,562	0	0
Norden, Rochford*	1,482	10	0

Latrines, Drainage, Fencing, etc.

Davidson	£746	17	9
Dowsing and Davis	660	0	0
Moss	652	10	4
Hyde and Co.	610	0	0
Brown Bros.	600	12	4
Jarvis	599	0	0
Beaumont	558	0	0
Willmott	558	0	0
Ramsbottom and Co.	551	0	0
Bennett	550	0	0
E. and B. H. Davey	546	0	0
Pavitt and Son	539	11	6
Parren and Son	500	0	0
F. and E. Davey	500	0	0
Johnson and Hawkes	497	0	0
Woodhams	480	0	0
Norden*	435	10	0

Architect's estimate, £1,570 and £430.

*Recommended for acceptance.

(*Tenders continued on page viii.*)

ROOFING SLATES.
Velinhelt, Penrhyn and Westmorland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

(EST. 1887).
CITY OF LONDON
AND
FINSBURY DRAWING OFFICES
(LEWIS PITCHPINE, Manager),
Working Drawings,
Perspectives,
Designs,
Tracings,
Prints,
Quantities,
Telephone - 1099 Central.
Telegrams—"PITCHPINE, LONDON."
63, FINSBURY PAVEMENT, LONDON, E.C.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs,
Premier Ironworks,
DEPTFORD, S.E.

WRITE TO THE MANUFACTURERS.
BAYLISS, JONES & BAYLISS, LTD.
FENCING GATES, ETC.
WOLVERHAMPTON & LONDON.
LOW PRICES. CATALOGUES FREE. (NAME THIS JOURNAL.)

NOSTELL BRICK AND TILE WORKS,
MANUFACTURERS OF NR. WAKEFIELD.
TERRA COTTA in BUFF, RED, &c.
ROOFING AND FLOORING TILES.
Tel. Address: "WINN NOSTELL"
Tel. No. 66, WAKEFIELD.
Representative: FRANK TALBOT, West Leigh, Walton, near Wakefield.

X PLASTER
CLARK & CO., 32a, Westminster Palace Gardens, S.W.
The Most Perfect Substitute for Keene's at almost the price of Lime
ONE material only required for both render and finish
A Perfectly Sanitary Fireproof Cement
Telegrams: "CLARCOLITE, LONDON." Telephone: 5321 WESTMINSTER.
Works: Newark-on-Trent, G.N.R.

FOLDING PARTITIONS. 2/- ft. Super.
REVOLVING SHUTTERS. 1/- ft. Super.
Hartley Bros., GORTON, MANCHESTER.

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork.

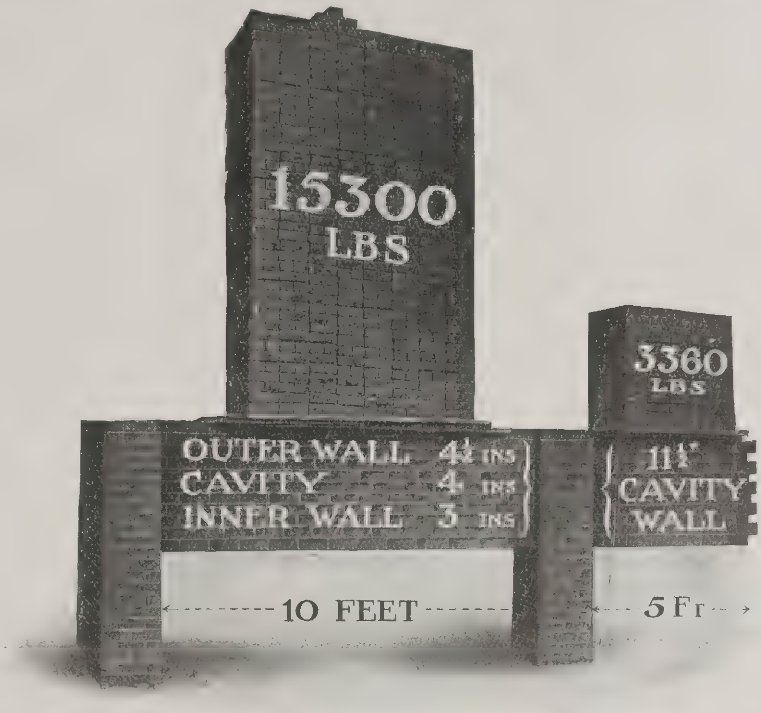
H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

RD. JOHNSON CLAPHAM, & MORRIS, Ltd.,



Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered Soundproof, Fireproof Dampproof,

Architects, Builders, and Contractors *Write for Descriptive Catalogue.*

Engineering Department,
24, Lever Street,
MANCHESTER.

Telegrams; "Metallicus, Manchester."

Hollow Wall and Cantilever constructed of 4½ in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

Telephone: 6437 Manchester.

J. G. HAMMOND & CO., LTD.

PRINTING CONTRACTORS.

LONDON WORKS: 32 to 36, Fleet Lane, Ludgate Circus, E.C.
MIDLAND WORKS: Scotland Passage, High Street, and Moor Street, Birmingham.

SPECIALITY:

CATALOGUES of all kinds,
PUBLICATIONS of all kinds,
BOOKS of all kinds.

LARGE INSTALLATION OF LINOTYPE AND MONOTYPE COMPOSING MACHINERY. ENGLISH, AMERICAN AND FAST ROTARY PRINTING AND FOLDING MACHINERY.

☛ IMITATION TYPEWRITTEN CIRCULARS supplied with names and addresses typed in separately to match the body or alternatively so printed as to enable you to type in the names and addresses on your own typewriter.

SEND FOR ESTIMATES AND UNIQUE TESTIMONIALS.

(Tenders continued from page vi.)

Milton, Portsmouth.—For erection of quarters for assistant medical officers, medical officer's residence, and extension of Nurses' Home at the Workhouse Infirmary, for Portsmouth Guardians. Messrs. Rake and Cogswell, architects, Prudential Buildings, Commercial Road, Portsmouth:—

H. Jones	£6,590
A. E. Porter	6,455
Sperring	6,370
Dowdell and Co.	6,154
E. and W. G. Payne	6,125
Light and Son	5,992
J. Crockerell	5,921
J. Tanner	5,900
M. Coltherup	5,750
F. Corke	5,689
F. J. Privett,* Cottage Grove, Southsea.	5,267

*Accepted.

Southgate, Middlesex.—For erection of a new secondary school, for the Middlesex County Council. Mr. H. G. Crothall, architect:—

Dove Bros.	£17,320
E. Lawrance and Son	16,574
Holloway Bros	16,000
F. G. Minter	15,675
Holliday and Greenwood, Ltd. ...	15,555
G. Neal	15,545
F. and H. Higgs	15,139
A. Porter	14,398
J. Dorey and Co., Ltd.	14,347
Treasure and Son, Ltd.	14,025
A. Fairhead and Son	13,959
H. Knight and Son	13,748
W. Lawrence and Son	13,670
Mattock Bros.*	13,493

*Recommended for acceptance.

Sutton, Surrey.—For the erection of a house in the Worcester Road, for Gerald Pilditch, Esq. Messrs. Frank Chown and Sheffield, architects, 2, Princes Street, Hanover Square, W. Quantities by Messrs. Andrews and Read, 13, Basinghall Street, E.C.:—

Gathercole Bros., Norbury	£1,960
G. Parker and Son, Peckham	1,937
E. J. Saunders, Croydon	1,924
J. Smith and Sons, South Norwood...	1,897
Cropley Bros., Ltd., Epsom	1,887
B. E. Nightingale,* London	1,755

*Accepted.

Taunton, Somerset.—For erecting a covered playground, changing-room, bath-room, box-room, etc., for the Council of Taunton School. Mr. F. W. Roberts, F.R.I.B.A., architect, 2, Hammet Street, Taunton. Quantities by the architect:—

T. Manning and Son	£2,065	0	0
H. Pollard and Son	2,047	11	3
W. G. Potter	2,047	10	0
Gleed Bros.	1,977	12	1
E. G. Coles	1,955	0	0
G. Pollard and Co.	1,920	12	0
H. G. Smith	1,632	7	9
H. J. Spiller and Son	1,616	0	0
T. H. Moggridge and Son ...	1,576	18	10
F. Small	1,564	12	3
A. J. Spiller,* Taunton	1,547	8	9

*Accepted

Walthamstow.—For erection of a higher elementary school on the Greenleaf Road site, for the Education Committee. Quantities by Mr. G. T. G. Wright, F.S.I., 3, Great Winchester Street, E.C.:—

Spencer, Santo and Co.	£13,325
F. and G. Foster	13,224
F. J. Coxhead	13,178
F. and A. Willmott	13,143
J. Cracknell	13,018
J. and J. Dean	12,966
Appleby and Sons	12,720
Lowe and Co.	12,681
H. J. Carter	12,598
F. and E. Davey	12,555
Kilby and Gayford	12,531
Rowley Bros.	12,468
R. and E. Evans	12,439
W. J. Maddison	12,429
B. E. Nightingale	12,265
Hammond and Son	12,264
Brand, Pettit and Co.	11,835
Knight and Son	11,744
G. J. Fisher	11,557

Westcombe Hill, S.E.—For the erection of bakery and stables, Westcombe Hill, Greenwich, S.E., for Messrs. Price and Company. Mr. M. W. Hudson, surveyor, 49, Western Road, Plaistow, E.:—

Freeman and Barber	£3,495
G. J. Hosking	2,295
E. Mills	2,289
F. Western	2,269
W. Nash	2,189
G. Parker and Sons,* Peckham ...	2,097

*Accepted.

York.—Accepted for the construction of a temporary timber grand stand (to seat about 5,000 persons) in the Gardens of the Yorkshire Philosophical Society at York, for the Executive Committee of the York Historic Pageant. Mr. F. W. Spurr, city engineer:—

W. Bellerby, Hungate Saw Mills, York, £1,607.

Notes and News.

The firm of Swinburne, O'Gorman and Baillie has been formed by the amalgamation of Messrs. Swinburne, Cooper, and Baillie, with Messrs. O'Gorman and Cozens-Hardy. Messrs. Swinburne, O'Gorman and Baillie will continue to practise as consulting engineers in electrical, automobile, and general work, at 82, Victoria Street, Westminster, S.W. The partners are:—J. Swinburne, M. O'Gorman, and G. H. Baillie. Mr. W. R. Cooper has severed his connection with Messrs. Swinburne, Cooper and Baillie, and will continue to practise as consulting engineer in electrical and experimental work at 82, Victoria Street, S.W.

* * *

At the meeting of the Architectural Association on February 5th, the president (Mr. Walter Cave), announced that Mr. Phené Spiers had presented the association with an original drawing by Professor Cockerell, of a proposed library at Cambridge. The drawing is an exceptionally beautiful piece of work.

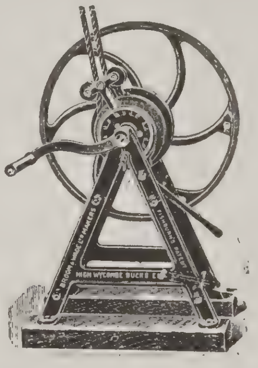
* * *

New elementary schools for the Lancashire County Council are now being erected at Failsworth, and also at Great Crosb-, under Mr. Henry Littler, County Architect. The constructional steelwork, concrete floors, and asphalte flat roofs, are being carried out by Messrs. Homan and Rodgers, Manchester.

* * *

In a recently-issued novel, one of the characters makes some observations reflecting on the water supply of Cheltenham. The author, it seems, was really thinking of some other town. He accordingly writes to the papers to offer his sincere apologies to the town of Cheltenham, the purity of whose water supply "has never been questioned."

LIFTS, CRANES, CRABS
REVOLVING SHUTTERS,
COLLAPSIBLE GATES,
SLIDING PARTITIONS.
DENNISON, KETT & Co., Ltd.,
11, Queen Victoria Street, LONDON, E.C.
Iron Staircases, Doors and Sashes.
CATALOGUE FREE ON APPLICATION.
Telegrams: "Hoisters, London." Telephone, Bank 8356. A B C Code.



Reduce your Wages by using
BROOM & WADE'S
PATENT HOIST.
This is the most Efficient Hoist on the market for hoisting barrows of bricks, concrete, &c., without Gearing.
BROOM & WADE, LTD.,
Engineers, HIGH WYCOMBE.

FIREPROOF
A Word to conjure with
TUTAPORT
TUTAPORT
REGISTERED TRADE MARK
Tr. Mk. No 303049 | Patent No 14117.
TUTAPORT DOOR
Unique in Every detail.
Thoroughly Reliable.
Answers its purpose.
Protects against Fire.
On scientific principles.
Right in price.
There you are.
The CHECKFIRE DOOR Co.,
2, Lonsdale Road,
Kilburn, N.W.

The "Centenary" Petrol Gas Turbine Generator,
For Supply to a City or a Cottage.
THE CENTENARY GAS CO. (Dept. E), 11, QUEEN VICTORIA ST., LONDON, E.C., & 109, Hope St., Glasgow.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Feb. 18. BRIDLINGTON.—Erection of new entrance and staircase at the Primitive Methodist Chapel, for the trustees. Apply, J. Earnshaw, architect, Carlton House, Bridlington, to whom submit tenders by 10 a.m., on Feb. 18.

Feb. 18. CONSETT.—Conversion of Consett British schools into reading and conversation rooms, for the Consett Iron Company. Apply to the company's architect at the general offices, Consett. Tenders by noon, on Feb. 18.

Feb. 19. HEADINGLEY, LEEDS.—Construction of brickwork culvert for the Corporation. Apply waterworks engineer, Municipal Buildings, Leeds. Tenders to Chairman of the waterworks commitee, Town Hall, Leeds, by 10 a.m. on Feb. 19.

Feb. 19. TAUNTON.—Erection of detached residence for head-master for the Council of Taunton school. Apply, architect's office. Tenders by first post Feb. 19, to F. W. Roberts, F.R.I.B.A., architect, 2, Hammet Street, Taunton.

Feb. 19. WOORE.—Execution of various works at Woore council school, including alterations and additions, for the Shropshire education committee. Plans, etc., may be seen, and forms of tender obtained, at the school house, Woore. Tenders by Feb. 19.

Feb. 19. PONTARDAWE.—Extension of Alltwen Congregational Chapel, and addition of organ chamber. Apply, secretary, R. E. Thomas, Paris House, Pontardawe. Tenders to the secretary, W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff, by Feb. 19; £3 3s. deposit.

February 19. DUBLIN.—Erection of dispensary buildings for governors of Jervis Street hospital. Apply, D. W. Morris and Co., surveyors, 68, Harcourt Street, Dublin, and to William H. Byrne and Son, architects, 20, Suffolk Street, Dublin. Estimates to the secretary, by February 19. £2 2s. deposit.

Feb. 19. WAKEFIELD.—Heating apparatus and chamber, Normanton Woodhouse Provided School; alterations and additions, Stainton Temporary Provided School; alterations and additions, Adwick-le-Street Temporary Provided School, for the West Riding Education Committee. Tenders by 10.30 a.m. on Feb. 19, to Francis Alvey Darwin, clerk of the C.C., County Hall, Wakefield, to whom apply. £1 deposit in each case, to the West Riding Treasurer, County Hall, Wakefield.

Feb. 20. CWM.—Erection of a new institute at Cwm, Mon., for the committee. Apply at office of Stanley H. Hutchins, architect, Risca, Mon. £2 2s. deposit.

Feb. 20. SHEFFIELD.—Erection of new ward blocks and kitchens at Royal Infirmary. Names to Gibbs and Flockton, architects, 15, St. James's Row, Sheffield, by Feb. 20.

Feb. 20. TREDEGAR.—Erection of a chapel for the Bethania Congregational Church. Apply, W. S. Williams, architect, Elmwood House, Tredegar, to whom submit tenders by Feb. 20.

Feb. 20. BELFAST.—Erection of two semi-detached villas at Fruit Hill Park, Falls Road. Apply to Young and Mackenzie, Scottish Provident Buildings, Belfast, to whom submit tenders by Feb. 20.

Feb. 20. DONCASTER.—Reconstruction of Golden Lion Hotel, Cleveland Street. Apply, James Heseltine, architect and surveyor, Old Castle Drawing Office, Pontefract, to whom submit tenders by Feb. 20.

Feb. 20. WINSFORD.—Erection of classrooms, lecture room, etc., at United Methodist Free Church School, High Street, Winsford. Tenders to F. Plumbley, 217, High Street, Winsford, by noon on Feb. 20. Apply Alfred Price and Son, architects and surveyors, Sandbach.

Feb. 22. NORTHENDEN.—Erection of school for the Cheshire C.C. Names and addresses to the clerk by Feb. 10. Tenders by 11.30 on Feb. 22, to Walter Taylor, clerk to the sub-committee, Technical School, Sale; £2 deposit.

Feb. 22. COVENTRY.—Erection of buildings at Foleshill Works, for the Corporation. Apply Fletcher W. Stevenson, engineer and general manager, Gas Works, Coventry, to whom submit tenders by 9 a.m. on Feb. 22; £1 1s. deposit.

Feb. 22. BURY ST. EDMUNDS.—Converting large room at town hall into public offices, etc., for the corporation. Apply borough surveyor's office. Tenders by noon on Feb. 22, to Walter D. Harding, Assoc.M.Inst.C.E., borough surveyor, town hall, Bury St. Edmunds; £2 2s. deposit.

February 22. TODMORDEN.—Erection of new secondary school for the Corporation. Apply architect, Jesse Horsfall, F.R.I.B.A., 4, Chapel Walks, Manchester, and Burnley Road, Todmorden, on and after February 15. Tenders, addressed Chairman of Education Committee, to James Whitehead, clerk to committee, education offices, Roomfield, Todmorden, by February 22.

Feb. 23. DONCASTER.—Erection of a school. Names and trades, with £1 1s. deposit, by Feb. 23, to Empsall and Clarkson, architects and surveyors, 7, Exchange, Bradford.

Feb. 23. CARRON.—Erection of a public hall at Carron, Morayshire. Mason, carpenter, slater, plasterer, painter, and glazier work required. Apply at the post-office, Carron. Tenders by Feb. 23.

Feb. 23. SEDGLEY.—Erection and completion of combined cookery, laundry work, and handicraft centres, for the Staffordshire education committee. Apply to Graham Balfour, director of education, county education offices, Stafford, by February 23. £1 1s. deposit.

Feb. 23. LEEDS.—Construction of a new boiler-house at the Town Hall, for the Corporation. Apply to W. T. Lancashire, city engineer, Municipal Buildings, Leeds. Tenders by 10 a.m. on Feb. 23, to the town clerk, town hall, Leeds.

Feb. 23.—NORTH SHIELDS.—Erection of a cement concrete retaining wall about 150ft. in length and 20ft. in height, for the corporation of Tynemouth. Apply, John F. Smillie, borough surveyor, Tynemouth, to whom submit tenders by 10 a.m., on Feb. 23. £2 2s. deposit.

Feb. 23. WHITCHURCH (near CARDIFF).—Erection of farm buildings in connection with the mental hospital, for the corporation. Apply, at the City Hall, Cardiff. Tenders by noon on Feb. 23, to J. L. Wheatley, town clerk, City Hall, Cardiff. £2 2s. deposit.

Feb. 24. DORCHESTER.—Erection of pavilion, and laying water supply, for the Doncaster Cricket Club. Apply to P. B. J. Harding (hon. secretary), Cambridge Road, Victoria Park, Dorchester. Tenders by Feb. 24.

Feb. 24. LOSTWITHIEL.—Erection of three or five houses at Lostwithiel, for the Lostwithiel Building Company, Ltd. Apply at the office of secretary, J. Venning, auctioneer, etc., Lostwithiel, to whom submit tenders by Feb. 24.

Feb. 24.—LIVERPOOL.—Construction of additional buildings to the Mansfield Street open-air bath, for the corporation. Apply to the engineer and chief superintendent, W. R. Court, Municipal offices, Liverpool. Tenders by letter post to the town clerk's office, by Feb. 24.

Feb 24. PONTYPOOL.—Erection of additions to hospital, Pontypool. Apply Sidney Williams, M.S.A., architect, Borough Chambers, Wharton Street, Cardiff. Tenders to B. Nicholas, J.P., Osborne House, Pontypool, by noon on Feb. 24; £1 1s. deposit.

February 24. CANTERBURY.—Erection of cottage at lunatic asylum, for the corporation. Apply, Jennings and Gray, architects, 4, St. Margaret's Street, Canterbury. Tenders to chairman at asylum, by 10 a.m., on February 24. £3 deposit.

February 24. LIVERPOOL.—Construction of additional buildings to open-air bath, for the corporation. Apply, engineer and chief superintendent (W. R. Court), municipal offices, Liverpool. Tenders by February 24, to Edward R. Pickmere, town clerk, Liverpool.

Feb. 24. HAMPSTEAD.—Alteration and enlargement of conveniences at Golder's Hill Park, for the L.C.C. Apply to the Parks Department, 11, Regent Street, S.W. Tenders by 11 a.m., on Feb. 24, to G. L. Gomme, clerk of the L.C.C., County Hall, Spring Gardens, S.W. Fair wages clause.

Feb. 24. GORGIE (EDINBURGH).—Building works for the corporation, as follows:—Excavator, mason, and brick works, iron and steel work, plumber work, slater work, cement and plaster works, glazier work, tile layer's work, ferro concrete work and asphalt. Apply to James A. Williamson, A.R.I.B.A., city superintendent of works, public works' office, City Chambers. Tenders by February 24, to Thomas Hunter, W.S., town clerk, City Chambers, Edinburgh. £3 3s. deposit.

February 25. MORLEY.—Alterations to engine house and new engine bed at Gillroyd Mills. Apply, on or after February 16, to T. A. Buttery, F.I.A.S., architect, Queen Street, Morley, and 1, Basinghall Square, Leeds. Tenders to the company's offices, by February 25

Feb. 25. HODDESDON.—Erection and completion of school for the Hertfordshire C.C. Apply County Surveyor's Office, Hatfield, on and after Feb. 12. Tenders by 5 p.m. on Feb. 25, to Urban A. Smith, county surveyor, county surveyor's office, Hatfield; £2 2s. deposit.

Feb. 26. LUTON.—Erection of school buildings on Beech Hill, Dunstable Road. Apply to J. R. Brown and Sons, architects, Castle Street, Luton. Tenders to Bruce Penny, town clerk, town hall, Luton, by noon, on Feb. 26. £1 1s. deposit (cheque crossed Barclay and Co., Ltd., Luton Bank.)

Feb. 27. YNYSYBWL.—Additions and alterations to the Ynysybwl mixed school for the Mountain Ash education committee. Apply to the architect, W. H. Williams, town hall, Mountain Ash. Tenders by February 27, to A. Morgan, director of education, town hall, Mountain Ash.

Feb. 27. COLCHESTER.—Erection and completion of superstructure of main building at Mile End, for the visiting committee. Apply, architect's office, on site at Colchester. Tenders by 10 a.m. on Feb. 27, to W. P. Gepp, clerk to the visiting committee, New Street, Chelmsford; £100 Bank of England note deposit.

March 1. MITCHELSTOWN (Ireland).—Erection of Convent National Schools in Mitchelstown. Apply Coroner Rice's offices, Fermoy. Tenders, by 10 a.m. on March 1, to W. Canon Rice.

March 1. SHEPTON MALLET.—Erection of five pairs of cottages, in Whitstone Road, Shepton Mallet, for Wainwrights and Heard, on behalf of E. Jardine. Tenders by noon on March 1, to architects' offices, West Shepton, to which apply.

March 1. SOUTHAMPTON.—Erection of an additional classroom for 60 children and two cloakrooms at Butlock's Heath council school, for the C.C. Apply at the office of W. J. Taylor, county surveyor, the Castle, Winchester. Tenders, by 10 a.m., on March 1, to H. Barber, clerk to the C.C., the Castle, Winchester.

March 2. STORNOWAY.—Erection of spire for church, for Deacons' Court of United Free English Church, Stornoway. Apply to Neil Maccallum, clerk to Deacons' Court, Stornoway, to whom submit tenders by March 2.

March 2. BRAY.—Erection of public library at junction of Florence Road and Eglinton Road, for the U.D.C. Apply, J. Charles Wilmot, C.E., 3, Lower Merrion Street, Dublin. Tenders at the meeting of the library committee, at 10 a.m., on March 2. £2 2s. deposit. Fair wages clause.

March 3. BATLEY, YORKS.—Erection of new church of St. Andrew, Purlwell, Batley, for the building committee. Apply to architects, Hoare and Wheeler, 11a, Orchard Street, London, W., also at the office of C. H. Marriott, Son, and Shaw, Church Street Chambers, Dewsbury. Tenders by noon, on March 3, to the honorary secretary, 77, Dark Lane, Batley, Yorks. £2 deposit.

March 12. WAKEFIELD.—Erection of schools at Wombwell, and at Aston-with-Aughton, for the West Riding Education Committee. Tenders by 10.30 a.m., on March 12, to Francis Alvey Darwin, clerk of the C.C., County Hall, Wakefield, to whom apply. £1 deposit in each case, to West Riding treasurer, county hall, Wakefield.

March 15. BIRKENHEAD.—Erection and completion of twenty-two double tenement corporation dwellings. Apply to Chas. Brownridge, M.I.C.E., borough engineer and surveyor, town hall, Birkenhead, to whom submit tenders by March 15.

March 16. ENFIELD.—Erection of a block of schools at Lavender Road, for the education committee. Apply to the architect, G. E. T. Laurence, 22, Buckingham Street, Adelphi, W.C., before Feb. 27. Tenders by noon, on March 16, to N. Hepworth, clerk, public offices, Enfield. £3 3s. deposit. Fair wages clause.

No date. SWANSEA.—Erection of a new block of offices in York Street, Swansea, for T. T. Pascoe. Apply to Margrave and Peacock, architects, Metal Exchange, Swansea. £5 5s. deposit (cheque).

ENGINEERING.

Feb. 19. LHANBRYD.—Introduction of a water supply to the special water supply district of Lhanbryd, for the Elginshire C.C. Apply, Charles C. Doig, C.E., 149, High Street, Elgin, to whom submit tenders by Feb. 19.

Feb. 22. TIPTON.—Providing and fixing a low-pressure heating apparatus at the public offices, for the U.D.C. Apply to Wm. H. Jukes, engineer and surveyor, surveyor's offices, public offices, Tipton, to whom submit tenders by Feb. 22. £1 1s. deposit.

Feb. 22. PONTYPRIDD.—(1) Supply and erection of a bridge in steel or ferro-concrete, and (2), masonry abutments and other works in connection, for the U.D.C. Apply, P. R. A. Willoughby, A.M.Inst.C.E., engineer and surveyor. Tenders by Feb. 22, to J. Colenso Jones, clerk to the council, municipal buildings, Pontypridd. £1 1s. deposit each contract.

Feb. 24. EDMONTON.—Engineer's work, cold and hot water supplies, atmospheric steam heating, gas supply, and fire hydrant, etc., at the new infirmary, for the guardians. Apply Alexander Drew, C.E., 64, Victoria Street, Westminster, S.W. Tenders, by 9 a.m. on Feb. 24 to F. Shelton, solicitor and clerk, White Hart Lane, Lower Tottenham.

Feb. 25. MANCHESTER. — Supplying half-inch high-pressure water meters to withstand a test of 3,000lb. per square inch, for the corporation. Apply to the secretary, waterworks offices, town hall, Manchester. Tenders by Feb. 25, to Wm. Henry Talbot, town clerk, town hall, Manchester.

Feb. 26. NETTESWELL.—Widening bridge in parish of Netteswell, for Essex C.C. Apply, chief surveyor's office, Chelmsford. Tenders by Feb. 26, to Percy J. Sheldon, M.Inst.C.E., chief surveyor, office of chief surveyor, Chelmsford.

March 1. BURY (LANCS.).—Hot-water supply in copper piping at the baths for the corporation. Apply at the borough engineer's office. Tenders to the town clerk, Bury, by 9 a.m., on March 1.

March 3. ASHTON-UNDER-LYNE. — Supplying (a) one water-tube boiler, and (b) one engine-driven induced draught fan, for the corporation. Apply to the borough electrical engineer, Wellington Road, Ashton-under-Lyne. Tenders by noon on March 3, to John Neal, borough comptroller, town hall, Ashton-under-Lyne. £1 1s. deposit.

March 4. ACKERGILL, CAITHNESS-SHIRE, N.B.—Construction of a reinforced concrete slipway and execution of other works for the Committee of Management of the Royal National Lifeboat Institution. Apply to G. Jamieson, at Wick, or at the office of the engineer and architect, W. T. Douglass, M.Inst.C.E., 15, Victoria Street, Westminster, London, S.W. Tenders before noon on March 4, to Charles Dibdin, secretary, 22, Charing Cross Road, London, W.C. £1 deposit, also 3s. 6d. not returnable.

IRON AND STEEL.

Feb. 18. OAKENSHAW.—Supply and erection of about 190 lineal yards of wrought-iron palisading at Victoria Park, Oakenshaw, for the Bradford corporation. Apply to the city engineer and surveyor, town hall, Bradford. Tenders by Feb. 18, to Frederick Stevens, town clerk, town hall, Bradford. Fair wages clause.

Feb. 23. LONDON (for India).—Supplying metals for the directors of the Bombay, Baroda, and Central India Railway. Apply to C. Crommelin, secretary, offices, Gloucester House, 2, 3, and 4, Bishopsgate Street Without, E.C., to whom submit tenders by Feb. 23. £1 1s. not returnable.

March 1. METHLEY.—2, Supplying and delivering 817 yards of 6in. cast-iron socketed pipes at the station, for the U.D.C. Apply to John S. Richardson, East Parade Chambers, Leeds. Tenders by noon on March 1, to R. S. Wigin, clerk, 83, Albion Street, Leeds; (see also "Plumbing and Sanitary").

PAINTING.

March 3. LEEDS.—Cleaning down, painting, etc., various police stations for the Corporation. Apply to W. T. Lancashire, city engineer, Municipal Buildings, Leeds. Tenders by 10 a.m. on March 3, to the town clerk, town hall, Leeds.

PLUMBING & SANITARY

Feb. 18. MERTHYR.—Construction of about 1,000 lineal yds. of 12in. sewer at Parknewydd Farm, for the Merthyr and Aberdare farm's management committee. Apply at the engineer's office, town hall, Aberdare. Tenders by Feb. 18.

Feb. 18. WALTON-ON-THE-NAZE.—Construction of public conveniences for the U.D.C. Apply, H. W. Gladwell, surveyor, town hall buildings, Walton-on-the-Naze. Tenders to clerk to the council, T. W. Wilson, town hall buildings, Walton-on-the-Naze, by 5 p.m., on Feb. 18. £2 2s. deposit.

Feb. 19. BACUP.—Construction of sewage conduit for the Corporation. Apply, borough engineer, Bacup. Tenders, by Feb. 19, to Joseph Entwistle, town clerk, Bacup; 10s. 6d. deposit.

Feb. 22. GRANGE-OVER-SANDS.—(a) Erection and fitting of public conveniences, (b) making-up Charney Road, for the U.D.C. Tenders by noon on Feb. 22, to Thos. Huddleston, engineer and surveyor to the council, council offices, Grange-over-Sands, to whom apply.

Feb. 22. WOOTTON BASSETT.—Providing and fixing a new pump, laying water pipes, erecting pump house, etc., for the Cricklade and Wootton Bassett Union. Apply, master of the workhouse, at Purton. Tenders by noon on Feb. 22, to H. Bevir, clerk to the guardians, union offices, Wootton Bassett.

Feb. 25. IPSLEY.—Construction of liquefying tanks, screening chambers, and bacterial filters, at Ipsley, for the Redditch U.D.C. Apply, Arthur J. Dickinson, engineer and surveyor, council offices, Redditch. Tenders by 5 p.m. on Feb. 25, to Browning and Hobson, solicitors, joint clerks to council; £1 1s. deposit.

March 1. METHLEY.—Laying 1,250 yards 15in. and 12in. stoneware pipe sewers and 817 yards 6in. cast-iron rising main; construction of engine house, circular tank, percolating filters, etc., for the U.D.C. Apply to John S. Richardson, East Parade Chambers, Leeds. Tenders by noon on March 1, to R. S. Wigin, clerk, 83, Albion Street, Leeds; £3 3s. deposit (cheque) (see also "Iron and Steel.").

March 4. STAVERTON.—Constructing sewage outfall works, and laying sewers in the parish of Staverton, for the Daventry R.D.C. Apply to the engineer to the council, J. B. Williams, the Moot Hall, Daventry. Tenders by March 4, to J. D. Spearing, clerk to the council, the Moot Hall, Daventry. £2 2s. deposit.

ROADS AND CARTAGE.

Feb. 18. TUNBRIDGE WELLS.—Paving, metalling, and making-up of parts of Holmewood and Woodland Roads, for the Corporation. Apply, the borough engineer and surveyor (W. H. Maxwell, A.M.I.C.E.), town hall, Tunbridge Wells. Tenders, by 9 a.m. on Feb. 18, to W. C. Cripps, town clerk, town hall, Tunbridge Wells.

Feb. 19. CAISTOR, LINCS.—Supplying about 7,000 tons of granite and about 1,600 tons of slag, for the R.D.C. Apply to A. A. Padley, clerk to the council, council offices, Caistor, Lincs. Tenders by Feb. 19.

Feb. 19. ABERTRIDWR.—Paving, kerbing, channelling, etc., to 30 houses, for Graig Building Club. Apply, D. M. Davies, architect, 38, Cardiff Road, Caerphilly. Tenders by Feb. 19, to E. Brinson, secretary, 29, Cardiff Road, Caerphilly.

Feb. 20. COSFORD.—Supplying pit stones for the repair of the highways, for the R.D.C. Apply at the offices of the council, at Hadleigh. Tenders by Ftb. 20.

Feb. 20. CLEWER WITHOUT, WINDSOR.—Making up York Road, for the R.D.C. Apply at the office of J. E. Gale, clerk, 3, Sheet Street, Windsor. Tenders by Feb. 20.

February 20. MAIDSTONE.—Supply and delivery of about 1,165 tons granite, for the R.D.C. Apply, Robert Hoar, clerk, 9, King Street, Maidstone, to whom submit tenders by February 20.

Feb. 20. PENRHYNDEUDRAETH.—Curbing and paving sidewalks for the Merioneth C.C. Apply to E. Vaughton, county surveyor, Arthog, Dolgelley, to whom submit tenders by Feb. 20.

Feb. 20. REIGATE.—Private street improvements in various roads, for the Corporation. Apply to Fred. T. Clayton, C.E., borough surveyor, Municipal Buildings, Reigate. Tenders by Feb. 20, to Alfred Smith, town clerk.

Feb. 20. NORTHAMPTON.—Supplying materials for twelve months ending March 31, 1910, for the corporation:—Broken granite, granite kerb, setts, etc., artificial stone paving, stoneware pipes, gullies, etc., Portland cement and lime, ironmongery, wrought iron, stel, etc., and various other accessories. Apply to Alfred Fidler, M.Inst.C.E., borough engineer. Tenders by noon on Feb. 20, to Herbert Hankinson, town clerk, Guildhall, Northampton.

Feb. 22. HORWICH.—Sewering, levelling, paving, flagging, etc., for the U.D.C. Apply, Peter Taberner, clerk, council offices, Horwich, to whom submit tenders by Feb. 22; £1 1s. deposit; fair wages clause.

February 22. SPALDING.—Supplying granite, slag, shingle, and gravel, for the Union R.D.C. Apply, H. Stanley Maples, clerk to the council, Spalding. Samples to the union workhouse, by 9 a.m. on February 22.

Feb. 22. ELKESLEY (near Checkerhouse, Notts).—Construction of an approach road to the proposed Elkesley pumping station, for the Corporation of Lincoln. Apply to the engineer, Neil McK. Barron, waterworks engineer, Lincoln. Tenders by Feb. 22, to W T. Page, deputy town clerk; £5 5s. deposit.

Feb. 23. YORK.—Supplying road-making material, carting, etc., during year ending March 31, 1910. Tenders, by Feb. 23, to F. W. Spurr, city engineer, Guildhall, York, to whom apply.

Feb. 23. MILTON.—Supplying surface picked flints and pit flints, fine gravel, Cherbourg quartzite, Kentish rag, horse labour, steam rolling and scarifying, for the R.D.C. Apply to E. C. Pearcy, district surveyor, 2, Crescent Street, Sittingbourne. Tenders by 4 p.m. on Feb. 23, to E. Cecil Haris, clerk, Sittingbourne.

Feb. 23. WILLESDEN.—Collection, removal, and disposal of house refuse, for 1, or 3 years, commencing April 1, for the D.C. Apply at the public offices, Dyne Road, Kilburn, N.W. Tenders by 4 p.m. on Feb. 23, to Stanley W. Ball, clerk of the council, public offices, Dyne Road, Kilburn, N.W.; 5s. deposit; and £10 note with each tender.

Feb. 24. DESBOROUGH.—Supply granite and limestone during year ending March 31, 1910, for the U.D.C. Tenders, by Feb. 24, to G. E. Marlow, surveyor, council offices, Desborough, to whom apply and send samples.

Feb. 24. HOLLINGBOURNE.—Supply and delivery of road materials from March to Sept., 1909, for the R.D.C. Apply, H. J. Bracher, clerk to council, 33, Earl Street, Maidstone, to whom submit tenders by Feb. 24.

Feb. 24. HORNSEY.—Sewering, levelling, paving, metalling, kerbing, channelling, and making good Hillside Gardens Highgate, for the town council. Apply to E. J. Lovegove, borough engineer and surveyor, municipal offices, 99, Southwood Lane, Highgate. Tenders by Feb. 24.

Feb. 25. CROYDON.—Supplying broken granite and various other materials, team labour, etc., for the R.D.C. Apply to Ernest John Gowen, clerk to the council, D.C offices, town hall, Croydon, to whom submit tenders by noon on Feb. 25.

Feb. 25. THAKEHAM.—Supplying broken basalt or granite, unbroken flints and gas tar, for year ending March 31, 1910, for the R.D.C. Apply to Wm. Forrester, surveyor, Storrington, Sussex. Tenders, by Feb. 25, to Percy Ayling, clerk to the D.C., council offices, Storrington, Pulborough.

Feb. 27. GILDERSOME.—Supplying granite during 1909. Samples and prices to the surveyor, W. Wilby, council offices, Gildersome, by Feb. 27.

Feb. 27. BELFORD.—Quarrying, breaking, carting, and laying on materials, and carting soil and scrapings on the several groups of highways, for the R.D.C. Apply, to the district surveyor, C. A. Lake, Warenford, Chathill Tenders by Feb. 27.

March 1. GLASGOW.—Paving various streets in the City with rock asphalte, for the corporation. Apply at the office of public works, City Chambers, 64, Cochrane Street. Tenders to A. W. Myles, town clerk, City Chambers, Glasgow, by 10 a.m., on March 1.

March 1. TENTERDEN, KENT.—Supplying quartzite, basalt, or other approved macadam; carriage of the above; supply and delivery of Kent ragstone and ragstone chippings; and mason's work; for the Corporation. Apply to W. L. C. Turner, borough surveyor, town hall, Tenterden, to whom samples should be sent. Tenders by March 1, to J. Munn Mace, town clerk, Tenterden, Kent.

March 4. BINGHAM.—Supplying granite, cinders, and cinder screenings for paths, for the R.D.C. Tenders by March 3, to R. H. Beaumont, clerk, Market Place, Bingham.

March 10. LICHFIELD.—Execution of private street works, and laying storm water drains in various streets for the R.D.C. Apply, C .O. Rawstron, district surveyor, Lichfield. Tenders by March 10, to John Derry, clerk to the council, R.D.C. offices, Lichfield; £2 2s. deposit.

MISCELLANEOUS.

Feb. 18. ASTON MANOR.—Supplying broken and unbroken stone, paving and common bricks, hardware (picks and shovels), etc., iron castings, coal and slack, drysaltery, mantles for street gas lamps, disinfectants, glass, cement, coaltar pitch, for the corporation. Tenders to the chairman of the public works sub-committee, Council House, Aston Manor, by Feb. 18. Apply, F. W. Richardson, borough surveyor, council house, Aston Manor. Fair wages clause.

Feb. 24. WORCESTER.—Providing and fixing notice boards in various parts of the county, for the C.C, general purposes committee. Apply to A. B. Rowe, county architect, 30, Foregate Street, Worcester. Tenders by Feb. 24.

Feb. 26. BAILIFFE BRIDGE (NEAR BRIGHOUSE).—Execution of asphalting work in the playground, Bailiffe Bridge provided school, near Brighouse, for the West Riding C.C. Tenders, to J. H. Thorpe, Education offices, town hall buildings, Elland, to whom apply by Feb. 26.

March 6. STAINLAND.—Asphalting work at playgrounds of Gretland Provided School, Bowling Green Provided School, Stainland, Sowood Green Provided School, Stainland, for the West Riding C.C. Tenders, endorsed "Asphalting," by March 6, to J. H. Thorpe, divisional clerk, education office, Elland.

No date. HEXHAM.—Erection of a cottage on the Woodley Field Estate. Names for selection to Edward Cratney, architect, 161, High Street East, Wallsend; quantities supplied.

THE

Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
30, Cross Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following:

A. S. (Wakefield), J. F. (Blackpool), S. W. G. (Nottingham), C. H. (Bournemouth), M. J. (Bromyard), R. E. P. (Littlehampton), G. G. (Egham), W. G. G. (London), W. B. (Manchester), C. B. W. (Caversham), G. W. (Margate), S. T. P. (London), H. C. W. (Forest Hill), C. S. (Devonport), R. P. M. (Glasgow), A. L. P. (Crewe), A. W. (Bolton), J. P. (Manchester), W. H. C. (Bristol), W. S. (Todmorden), T. C. C. (Forest Hill), L. G. (Watford), J. L. (Edinburgh), B. G. (Kingston), H. A. C. (London), D. L. H. (Borth), G. V. C. (Birmingham), J. R. L. (Burnley), W. C. W. (Dulwich), J. B. T. (Darwen), L. L. (Cardigan), T. R. P. (Cardiff), E. H. (Cheshire), J. W. P. (Cambridge), T. P. (Croydon), V. W. (Bournemouth), C. P. (Frinton-on-Sea), W. G. (Liverpool), J. P. G. (Belfast), H. T. (London), J. P. T. (Darwen), T. M. (Southport), A. C. B. (Maidenhead), J. C. H. (Northampton), J. S. (Nantwich), H. P. (Newcastle), J. L. (Wandsworth), S. J. A. (Bridgwater), A. W. A. (Hawkhurst), T. B. (York), C. R. (York).

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ADVERTISER (28), seeks re-engagement, ten years' thorough practical knowledge of building, estate management, and repairs, etc.; experienced in preparing plans and estimates, including quantities, for new works: highest refs. — Y., 86, Coniston Road, Muswell Hill, N. 4805

ADVERTISER (27), Architect and Surveyor, recently returned from Sudan, after completing engagement, desires position as architect or manager to building estate.—Baratt, Holyrood House, Gravelly Hill, North, Birmingham. 4842

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill. 4809

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. 4828

ARCHITECT and Surveyor's Assistant desires engagement; 6½ years' sound provincial experience; good draughtsman, working drawings, details, colourist; perspectives, surveying, levelling; assist quantities; general routine, specimen drawings; highest references; moderate salary.—S. Osgood, Chelsfield Park, Orpington, Kent. 4801

ARCHITECT'S Assistant (23), desires engagement; 7 years' eaxperience.—Sedgwick, Belvedere Road, Sunderland.

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECT'S Assistant (23), late pupil, seven years' all-round experience, been clerk of works, working drawings, details, etc., knowledge of quantities and perspective.—E. P. Lee, 631, Commercial Road, London, E. 4781

ARCHITECTS, builders, estate agents (19), good energetic draughtsman, tracing, colouring, working drawings, etc.; willing to assist in office work; references.—F. J. Williams, 89, Shrubland Street, Leamington Spa, Warwickshire. 4796

ARCHITECT'S good all-round Assistant; 10 yrs.' exp. North, South, and Wales; quans., details, working drawings; mod. salary.—W. T., 14, Stanhope Road, Stockton-on-Tees. 4798

ARCHITECT'S assistant (23), over 7 years' London and Provincial experience; excellent references; Inter.R.I.B.A. Exam. — H. J. Wilson, "Brinkdale," Park Road, Peterborough. 4670

ARCHITECT and Surveyor's Assistant (21), seeks re-engagement; 5 years' experience in church and domestic work in larger provincial office; good draughtsman and colourist.—Box 4823, Builders' Journal Office.

ARCHITECT'S Junior Assistant (19), 4 years experience in West End Office, working drawings, details, perspectives, competitions, excellent references; salary 21s.—Box 4777, Builders' Journal Office.

ARCHITECT'S and Surveyor's Assistant, 15 years' good practical experience; excellent draughtsman, designer and colourist; working drawings, details, specifications, surveying, levelling and general routine; excellent references; moderate salary.—A. R., 1, Ivy Villas, Cheam, Surrey.

ARCHITECT'S, Surveyor's or Builder's Assistant (23), Inter.R.I.B.A., good draughtsman, levelling, surveying, specifications, assist quantities, supervision, estate work; correspondence, accounts; excellent references; moderate salary.—H. O'R., 80, Lavender Sweep, Clapham, S.W. 4810

ARCHITECT'S Assistant, thoroughly experienced, temporary employment; domestic work, business premises, schools, etc.; surveying and levelling, etc.; two years' experience in Structural Engineer's office; salary moderate. — Box 4820, Builders' Journal Office.

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

ARCHITECT, estate agent, or builder's assistant, experienced in all branches; good references.—R. S., Eagle House, Marine Parade, Clacton-on-Sea. 4816

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, Builders' Journal Office.

ASSISTANT (27), good rapid draughtsman, competent all branches, will accept small salary for re-engagement in or near London.—Ernest Frost, "Dunsmore," Horeham Road, Sussex. 4824

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

BUILDERS' Assistant desires situation; thorough knowledge plans, specifications, quantities, measuring; not afraid of work; salary not so much an object as permanent situation; 21; 5 years' experience.—Box 4839, Builders' Journal Office.

BUILDER'S general foreman, advertiser seeks engagement; 16 years' service as above with first-class London firm on important and various works; good references.—Address H., 150, Effra Road, Wimbledon, S.W. 4703

BUILDERS', Surveyors' Assistant (24), capable and reliable, seeks re-engagement, thorough practical knowledge of construction, surveying, measuring up, good draughtsman, supervision, also costs, accounts, wages, etc.; mod. sal.—Box 4841, Builders' Journal Office.

BUILDERS' Assistant desires work; plans, estimates, setting out buildings, measuring up, prime costing, surveying, and levelling plots, ordering exact quantities, materials; 11 years' experience.—Box 4803, Builders' Journal Office.

BUILDER'S or Architect's Junior Assistant (18), good tracer, well up in prime cost, and general office work; excellent references; three years' experience. — J. W., 164, Wellesley Road, Ilford, Essex. 4833

CARPENTER, or Handy Man, tall; age 34; take charge on large jobs, wants work; 7 years' good reference; moderate salary.—H.C., Box 4838, Builders' Journal Office.

CLERK of Works seeks re engagement; just finishing public building; varied experience, notably ferro-concrete construction; well recommended; testimonials most excellent; age 45.—A. B., Box 4814, Builders' Journal Office.

CONTRACTOR'S outdoor manager and surveyor desires engagement; present situation 17 years; age 37; keen on variations; expert in measurements; all trades, quantities, estimating; town or country.—W., 2, Dalberg Road, Brixton. 4776

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.

ENGINEER, general, wants permanent appointment, official or private staff; thorough all-round experience; electrical, plumbing, smith, married, 34; good testimonials.—86, Bathurst Gardens, Willesden. 4704

ESTATE Owners.—Bricklayer, all-round, stone-waller, and general repairs; abstainer; good references; moderate wage for permanency.—Quinton, 12, Holland Road, Aston, Birmingham. 4802

FIREPROOF Engineers and Concrete Specialists. Advertiser, connected with above trades for 20 years, and whose name is well known in connection with same, desires position as manager, traveller, or head clerk; first-class book-keeper; aged 33; very moderate salary.—P. W. Potter, 73, Penshurst Road, Thornton Heath. 4719

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, Builders' Journal Office.

FOREMAN Painter (working) seeks re-engagement); experienced in all class work in building trade, as for general alterations, etc.; good supervisor, and reliable; either town or country; abstainer.—X. Y. Z., 8, Barton Street, Westminster. 4807

GENERAL Foreman seeks re-engagement, thoroughly practical in all branches; trade, carpenter and joiner, good draughtsman, first class references; town or country.—A. J., 196, Murchison Road, Leyton. 4804

GENERAL Foreman seeks re-engagement; alterations or new, practical experience in all branches; carpenter and joiner; good references; age 30; moderate wages.—Caplen, 3, Victoria Mansion, Edgware Road, Paddington, W. 4779

GENERAL Foreman seeks re-engagement, thoroughly practical and reliable; new or alterations; carpenter and joiner; life abstainer; first-class references.—Foreman, 3, Hawbridge Road, Leytonstone. 4787

HEATING.—Schemes, quantities and prices, tracing, workmen's sheets and costs; shorthand-typist (speeds 90/40); 5 years in Midlands; good refs.; disengaged.—Box 4834, Builders' Journal Office.

JUNIOR Assistant desires situation, home or abroad; good practical knowledge of construction and details; competent draughtsman and colourist, working drawings, measuring and supervising, surveying and levelling; moderate salary.—Box 4613, Builders' Journal Office.

PAINTING, paperhanging, distempering, graining wanted, piecework, new work at greatly reduced prices; specimen showing architects' and surveyors' testimonials for quality and cheapness.—Galton, 6, Parolles Road, Upper Holloway, N. 4761

PLASTERER, good jobbing bricklayer, roofs, fire work, stoves, tiling, etc., etc., generally useful, good reference, moderate wages, non-union.—A. Trigg, 117, St. John's Hill, Clapham Junction, S.W. 4856

QUANTITY Surveyor's Assistant (21), 4 years' experience, desires engagement, certificates and good references. — Apply Box 4745, Builders' Journal Office.

QUANTITY, General Surveyor's Junior Assistant, four years' experience; working up measuring existing buildings, good draughtsmen, little estate work; City Poly student.—J. R. O., 233, Essex Road, N. 4844

REINFORCED concrete foreman, disengaged, long and varied experience, especially in Kahn bars and expanded metal, timbering a speciality; carpenter by trade; good refs.—G. C., 59, University Road, Tooting, London. 4721

R.I.B.A. Final Exam., 7 years' experience, 1½ in Paris; good all-round man requires berth at home or abroad; good refs.; salary moderate.—Box 4799, Builders' Journal Office.

SHOP-FITTING, advertiser (38), well up in all branches of air-tight work, seeks situation as foreman in shop-fitting or joinery works; 9 successive years' with present employer.—Apply, Box 4837, Builders' Journal Office.

SUN copies, tracings, and plans prepared.—Geo. Tune, Trevor, Llangollen, N. Wales. 4831

SHOP or general foreman, good draughtsman, good all-round experience, including reinforced concrete work; or as estate manager, preparing plans for same, etc.; country preferred. — "St. Osyth," Goldsworth Road, Woking, Surrey. 4829

TO Estate Owners, builder, experience, in all trades, desires position as manager (working or otherwise); plans prepared, quantities, setting out, accounts and supervision; abstainer; country preferred.—Box 4806, Builders' Journal Office.

VOLONTAIRE.—Foreign gentleman (21) desires position in builder's office, with opportunity of learning.—B. B., 43, Bolingbroke Grove, Wandsworth Common, S.W. 4789

Appointments Vacant.

ARTICLED Pupil, vacancy for same in an old-established architect's and quantity surveyor's office, on the South coast; trained under principals; moderate premium; part returned. A typewriter will receive greater consideration.—Apply Box 4822, Builders' Journal Office.

BUILDERS' Junior Assistant wanted, accustomed to tracing and general office routine.—Apply, T. S. Foster, Builder, Abergavenny, Mon. 4840

WANTED immediately, Architectural Assistant in public office in North, for 6 months, where a variety of work is being carried out, to prepare sketch plans from instructions, working and detail drawings, specifications, etc., with thorough knowledge of quantities; he must be a quick and good constructional draughtsman; salary, £2 5s. per week. —Apply, with copies of 3 recent testimonials, to Box 4836, Builders' Journal Office.

WANTED, Junior Assistant, also improver; state age, salary, full particulars.—Box 4858, Builders' Journal Office.

WANTED immediately, one or two good men thoroughly experienced in composition floor-layers. —Apply, giving experience and wages required, Box 4860, Builders' Journal Office.

February 24, 1909. Volume 29. No. 8.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: The Grand Manner; The Architectural Profession of To-day; Town Planning, 157; The Evolution of Indian Architecture; The Art of the Plasterer; No More Workhouses. 158.
R.I.B.A.: Town and Country: Some Aspects of Town Planning. By H. V. Lanchester, F.R.I.B.A. - - - - - - - - 160
The Three Churches of St. Paul. By Mervyn E. Macartney, B.A., F.R.I.B.A. - - - - 162
Growth of Design in Woodwork - - - - 164
Planning of Schools. By H. T. Buckland - 166
The Influence of Material on Woodwork Design 169
Proposed New Works - - - - - - - 170
Works in Progress and Completed - - - 170
The Newest Junior following in Illustrious Footsteps - - - - - - - - - 170
The Concrete Institute. The Commercial Aspects of Reinforced Concrete. By Lucien Serraillier - - - - - - - - - 171
Notes on Competitions - - - - - - - 171
Enquiries Answered - - - - - - 172
Law Case - - - - - - - - - - - 172
Guild of Architects' Assistants - - - - 172
Trade and Craft: Fawcett's Mon'lithcrete Floor 172
Our Plate - - - - - - - - - - - 173
Federation News - - - - - - - - 173
Local Government Board Enquiries - - - 173
Tenders - - - - - - - - - vi., vi
Complete List of Contracts Open - - xvii.-xix.

ILLUSTRATIONS.

Blackpool Central Library Competition: Designs selected for Second Place. Messrs. Russell and Cooper's, 159; Messrs. Thomson and Bristow's, 161; Mr. H. R. Gardner's, 163; Mr. C. H. Potter's, 165; Messrs. Cooper and Slater's, 167.
Extension of East Riding (Yorks) County Council Offices, Barnsley. B. S. Jacobs, F.R.I.B.A., Architect - - - - - - 168
East Riding County Council Offices. B. S. Jacobs, F.R.I.B.A., Architect. Centre plate.

The Grand Manner. It is significant of the trend of architectural design that Professor Reilly should read a paper on "The Grand Manner in Architecture" before the Sheffield Society of Architects. It is becoming evident to thoughtful people that thorough training in classic and academic architecture is an absolute necessity if Britain is to produce any fine public buildings. The outcry that always occurs after a big competition, such as that for the London County Hall, inevitably results from lack of architects trained on the lines obtaining at the Ecole des Beaux Arts. Professor Reilly takes the three main qualities of the grand manner as "unity, largeness of scale, and restraint." "The sublime," he said, quoting Sir Joshua Reynolds, "impresses the mind at once with one great idea. It is a single blow." It is perhaps one of the unfortunate results of the Gothic revival that present-day architects are inclined to look after the details and let the mass take care of itself. It is equally reprehensible that some of the younger Classic school are inclined to make the massing of their buildings everything and leave the details to chance. At the same time the mass is the first thing in the building that tells. As the majority of people have little time to study anything else, it is well that the first impression of the building should be a good one. The architect may find many beautiful details in a ragged building; it is doubtful whether the general public will ever do so. Professor Reilly is only asking for the necessary concomitant to town planning, or, as Mr. Lanchester has it, "The importance of ordered dignity and grace in our towns." It was pointed out to us the other day that what our architectural schools most require is a demonstrator trained at the Ecole des Beaux Arts, and that sound Classic training and a thorough knowledge of axial planning would work wonders in the design of our future public buildings. At the present time we are hopelessly behind France, Germany, Austria and America in the matter of public architecture and planning, and shall continue to be so unless the Board of Architectural Eduction bestirs itself more thoroughly than it has done heretofore. It is satisfactory to find that in Liverpool Professor Reilly has made a beginning. Quite recently we published particulars of Mr. Lever's donation to the Liverpool School for the purpose of studying town planning. Probably no centre in England is more fitted to commence such a good work than the city which enshrines St. George's Hall.

The Architectural Profession of To-day. Mr. James Crocker, the retiring President of the Devon and Exeter Architectural Society, made some pointed remarks in his last presidential address at Plymouth on the 13th inst. on the subject of overcrowding in the architectural profession, and on the question of registration, which he regards as the remedy for the trouble. In this matter Mr. Crocker is following a lead which we gave some months ago in our series of articles on "The Architectural Profession of To-day"; articles which brought numerous letters showing how, in the provinces, both principals and assistants were suffering acutely, and unemployment was rife. Mr. Crocker has, however, discovered another cause—the abnormal increase of speculative building. Concerning this he says the public have yet to learn that "building is not necessarily architecture," or that there is but a "slight difference between a jerry-built house and a well-built one." Mr. Crocker believes that if architects in the country were to put into practice what the enormous majority of them are perfectly agreed upon, they might bring about the registration measure without delay. He spoke strongly of the official indifference which was one of the gravest hindrances to the passing of the Registration Bill. He referred to the overcrowded state of the profession (which the Registration Bill would partially cure) and remarked on the great facilities for learning drawing and architecture in the various schools and colleges, creating draughtsmen by machinery. It would be wisdom if some amendment of the apprenticeship system could be enforced by law. The temptation to take large premiums from the parents of lads who are naturally unfitted for the architectural profession is only too easy, and it is often done without any real intention of properly instructing them in the rudiments of their profession. The addition of the schools and colleges has taken considerable responsibility off the shoulders of the architect, who usually insists on the attendance of his pupils at the local classes as a necessary supplement to the experience to be obtained in his office. Practically all the instruction the apprentice receives is at these classes, with such wrinkles as he can pick up from the other draughtsmen. The personal experience of the principal, which is such a helpful factor to the architect he knows nothing of, and thus parents are very often deceived about their sons, because the principal never troubles to gauge their capabilities for an artistic career.

Town Planning. The paper read by Mr. H. V. Lanchester on the 15th, at the Royal Institute of British Architects, and the paper read by Mr. Needham Wilson, at the Architectural Association last Friday night, have a certain connection between them, in that they both draw attention to the public interest, or want of interest, in matters architectural. Mr. Lanchester has been studying an important question, which was bound to attract more or less attention as it is the subject of an important Bill to be dealt with during the present session of Parliament, and will have far-reaching consequences on the future housing of the population. "The Times" devotes a leading article to this lecture, but largely nullifies the importance of an architect's views by calling him "Doctor" Lanchester throughout. It is an unfortunate fact that architects have been boycotted by the President of the Local Government Board all through the drafting and preparation of the Bill; and the overtures of the R.I.B.A. and its very pertinent reminder that the subject concerned architects as much as any other class, only brought down upon them what we have previously described as a snub—the snub of being ignored. "The Times" itself but emphasises the difficulty which all town planners will have to contend with when they actually get to work: that is, the aversion of many people who claim to have an æsthetic or artistic objection against "the importance of ordered dignity and grace in our towns." The comparatively recent proposal to treat the buildings in Kingsway as a complete and ordered scheme for the purpose of making a fine street was at once met with diatribes from these same people against the monotony which the carrying out of such a scheme would in their opinion entail. The average pictorial artist is ever ready to find greater beauty in a tortuous street of haphazard design than in the finest boulevard to be found in Paris, Berlin, or Vienna. The trouble is a division of opinion among artists—a dispute between the architects and the painters—and it will take some getting over. Possibly Mr. Burns feels that this is exactly his opportunity to shine as a plain business man entrusted with great administrative powers; and in effect he says "A plague on both your houses," and endeavours to carry out his schemes with the sole assistance of the practical engineer. We think that the game of attempting country planning in towns has lasted long enough; that if we are to live amid square miles of houses the owners or builders of these houses have a definite obligation towards the community, and that they must defer to the opinions and feelings of the community as guided by professional men whose experience and education entitle them to be heard on such a matter. On their private grounds in the country the lover of chaos can build what seems best to him, but some kind of regulation and order are required to prevent the outskirts of towns being given up to "monotonous ranges of inanely designed and badly built houses, our slums of the future." And meanwhile those people who prefer chaos should remember that cities are artificial creations, and their growth must be dealt with by regulations suitable to the growing needs of the people.

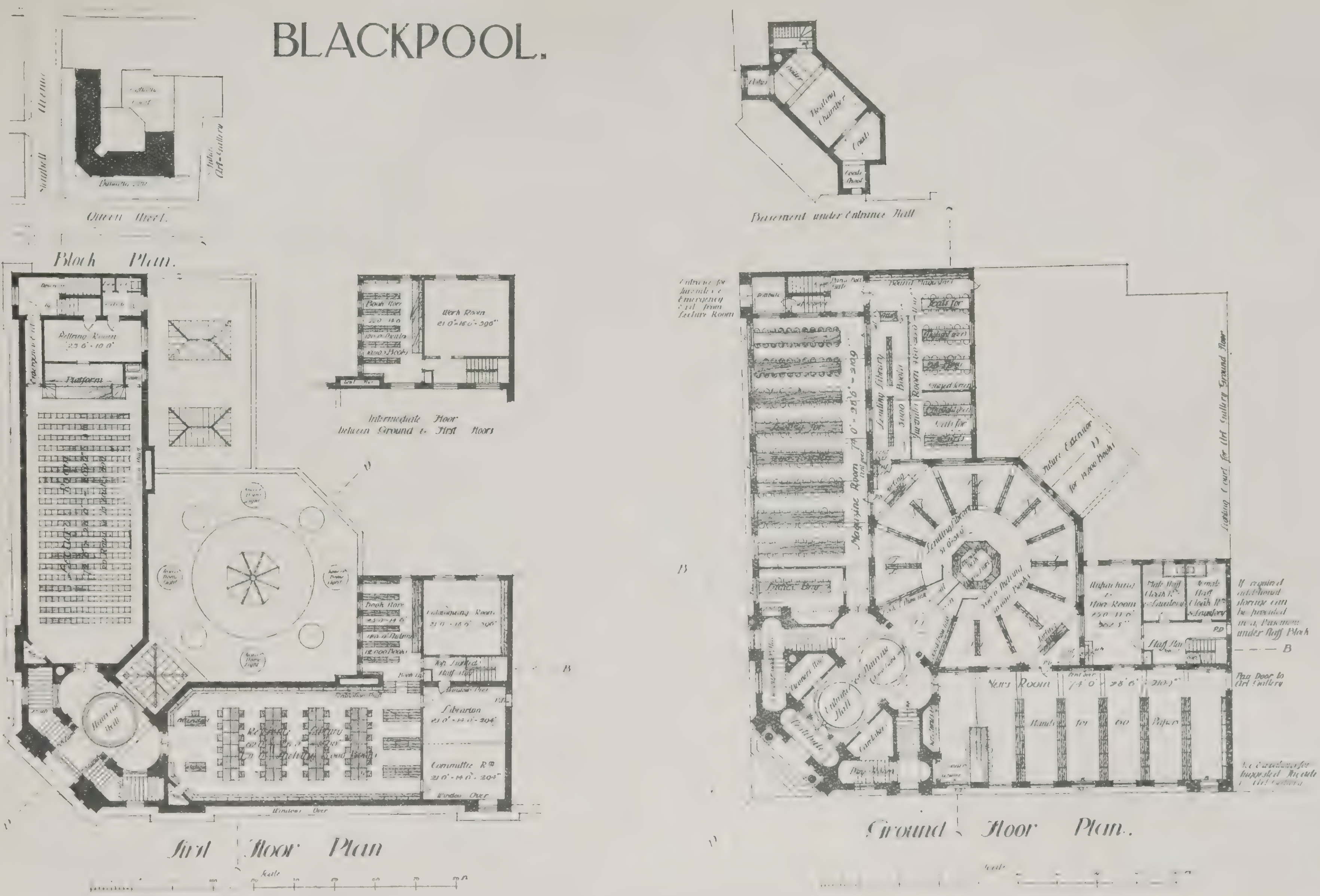
The Evolution of Indian Architecture. Indian architecture has hitherto been but little studied, for obvious reasons. Interest in it, however, is certainly increasing. At a recent meeting of the British Academy, Mr. A. A. Macdonald, Boden Professor of Sanskrit in the University of Oxford, read a most interesting paper on "The Evolution of Ancient Indian Architecture," in which he traced the builders' art to its most primitive beginning. Owing to the lack of early historical literature, he said, the study of archæology in India was relatively of more importance than in any other country; but the rapid destruction of the remains had only been arrested by the passing of the Ancient Monuments Preservation Act by Lord Curzon in 1904. In the pre-Buddhistic period, Professor Macdonald remarked, the buildings were of wood, there being no temples, nor carved images of gods. Bricks first appeared in the fifth century B.C., and from the middle of the third century B.C. the Buddhists began to build in stone. The history of Buddhist architecture might be divided into three periods—250 B.C. to 50 A.D., 50 to 350 A.D., and 350 to 650 A.D. Of the three classes of buildings (1) the stupa was a development of the low sepulchral mound of earth, and was originally a hemispherical structure erected to enclose relics of Buddha; the ornament on top (called a tee) ending in one or more umbrellas. By successive stages, both the stupa and the tee were elongated to assume the shape of a tower. The former then became attenuated, while the tee grew in height, the umbrellas becoming roofs, ultimately reaching the final development of the nine-storeyed Chinese pagoda, in which the stupa was no longer seen; (2) the chaityas, or assembly halls, were wagon-headed structures, with aisles and an apse, under which was placed a small stupa as an object of veneration. The earliest were rock-cut specimens dating from the third century B.C., and obviously imitating wooden buildings. The originally quite plain stupa had later a figure of Buddha carved on its front. About 600 A.D., the stupa became a hollow cell with the figure inside, and this marked the transition to Hindu architecture. The subject seems to deserve closer attention than it has hitherto received, for the more intimate study of early Eastern architecture may quite possibly reveal some hitherto unsuspected relationships with the art of the West.

The Art of the Plasterer. If the revival of the art of the plasterer is not proceeding on right lines, it is not for want of competent advice. The subject is being taken up enthusiastically by men who have a very clear perception, not only of its possibilities, but, what is perhaps even more important from the artistic point of view, of its limitatons. Mr. William Banbury, who read a paper recently on "Decorative Plasterwork" to the Aberdeen Architectural Association, is of this enlightened school. He urged that the material must in no circumstances be forced into unnatural forms, and should by no means be perverted to the imitation of effects that are proper to wrought iron, or to the carving of wood or stone. Fortunately, the mania for "sharpness" is dying out, even among photographers, and the peculiarly soft effect native to properly produced plasterwork is now becoming recognised as a merit instead of being despised as a defect. It is in certain respects inimitable, and therefore it need never be imitative. The art is not only venerable for its antiquity—work of the kind was found in Mesopotamia, ancient Egypt, and old Greece and Rome—but had the sanction of the Italian masters of the Renaissance, by whom it was introduced into England in the time of Henry VIII. As the Scottish plasterers are certainly among the best craftsmen engaged in the work, it is not surprising to find that so much interest is being taken in the subject up north, especially when such able lecturers as Mr. Banbury are at command. The working plasterers were at one time a very "close corporation," and it was even said that they were all related to each other in various degrees of kindred affinity! If the demand for artistic plasterwork continues to grow at the present rate, this interesting little family group will hardly be able to cope with its volume; and some of the family traditions that happen to be out of accord with the truer and purer principles that are being advocated with such sturdy insistence will have to be abandoned.

The Clerical Architect. We have, for some time past, been following a controversy in our contemporary "The Tablet," upon the question of the clerical architect, or, as one of the controversialists puts it, "an ecclesiastic, who is also an architect at one and the same time." It appears that one or two of the Catholic clergy are reported to have been trained as architects, and the Canon Law of the Church does not prohibit their acting in both capacities. The grievance of the architects is that these clerical architects work without fees, for the benefit of the Church, it is true, and thus help to make the already hard lot of the architect still harder. The trouble seems to be confined to the Roman Catholic community, which, however, numbers in its ranks several of our well-known architects. We should hesitate to intrude on what appears to be a family dispute, were it not for the fact that a cleric, writing under the nom de plume of "An Old Priest," makes general charges against the architectural profession of receiving discounts from contractors, which he does not allow to his clients. This is a very grave offence, and, as Mr. C. M. Hadfield points out, entails expulsion from the Royal Institute of British Architects, and is also actionable at law. It is not conformable with the polite usages of newspaper controversy to make general and grave charges against the profession to which your opponents may happen to belong, nor do we think the matter is improved when "An Old Priest" unhesitatingly withdraws the statement, so far as Mr. Leonard Stokes is concerned, because Mr. Stokes writes—quite superfluously, since he of all men is entirely beyond suspicion—denying point-blank that he ever received discounts from contractors. It would be more to the point if "An Old Priest" would point out those architects whom he knows are in the habit of receiving discounts from the contractors; the Royal Institute of British Architects, at all events, is open to receive and act upon such information. It is extremely regrettable that such charges should be made, even in the heat of controversy; and it does not savour of the sublime charity which one usually associates with the cloth.

No More Workhouses. The report of the Royal Commission on the Poor Law, which was published last Wednesday, will in effect create new conditions with which the architect and the builder will be called upon to deal. The old system is to be ruthlessly swept away, and new methods and a new spirit are to be introduced. The Poor Law Guardians are to be abolished, and such buildings as they were wont to commission will forthwith become obsolete. The poor are no longer to be lumped together without classification in the "general mixed workhouse." They will be distributed among seven separate institutions, which will severally accommodate (1) the children; (2) the aged and infirm; (3) the sick; (4) the able-bodied men; (5) the able-bodied women; (6) the vagrants; and (7) the feeble-minded and epileptic. It would seem, therefore, that we shall get smaller buildings and more of them. They should by no means be allowed to perpetuate the characteristic features that rendered the old type of building so repulsive. On the contrary, they may be reasonably expected to express the new spirit—the more discriminating and more humane view of the poor who are always with us, and whose poverty, always deplorable and sometimes reprehensible, is frequently blameless and even honourable. There thus arises an excellent opportunity of evolving a new type of building, with seven variations, and in every one of them there should be visible a comeliness and a kindliness that hitherto have been too often felt to be inappropriate to the architectural treatment of a mere workhouse. Architects will be glad to soften the asperities, and to design buildings that shall at all events be less blatantly brutal than the elevations hitherto most commonly associated with rate-aided poverty. We are not blaming the architect of the old-style workhouse. He was governed by a bad tradition, which should now be swept into oblivion, and from which he will be heartily glad to make his escape. How is it that almshouses are usually pleasant to look upon, while workhouses are exactly the reverse? Is it not because of the very different spirit in which the charity is administered in the two cases? In the almshouses it is voluntary and genial; in the workhouses, reluctant and austere. Therefore, in the one case the architect is apt to embody the spirit of love and pity; in the other he has found it difficult to disguise the spirit of contempt. His new employers will set him a far more congenial task. The abolition of the workhouse is an æsthetic boon.

BLACKPOOL.


Queen Street.
Art Gallery
Block Plan.
Basement under Entrance Hall
Heating Chamber
Coals
Intermediate Floor between Ground & First Floors
Work Room 21 0" × 16 0" - 396"
Book Store
Retiring Room 23 6" × 10 0"
Platform
Lecture Room
Librarian 21 0" × 14 0" - 294"
Committee Rm 21 0" × 14 0" - 294"
Window Over
Cataloguing Room
Book Store
12,000 Books
Staircase Hall
First Floor Plan
Scale
Entrance for Juveniles & Emergency Exit from Lecture Room
Magazine Room 74 0" × 28 6" - 2109
Lending Library 3000 Books
Juvenile Room
Lending Library
Future Extension for 14,000 Books
Lighting Court for Art Gallery Ground Floor
Unpacking & Store Room
Male Staff Cloak Rm & Lavatory
Female Staff Cloak Rm & Lavatory
Staff Stair
If required additional storage can be provided in a Basement under Staff Block
News Room 74 0" × 28 6" - 2109
Stands for 60 Papers
Pass Door to Art Gallery
Entrance Hall
Vestibule
Indicator
Ground Floor Plan.
Scale

BLACKPOOL CENTRAL LIBRARY COMPETITION: ONE OF FIVE DESIGNS BRACKETED FOR SECOND PLACE. RUSSELL AND COOPER, ARCHITECTS.

R.I.B.A.

TOWN AND COUNTRY: SOME ASPECTS OF TOWN PLANNING.*

By H. V. Lanchester, F.R.I.B.A.

Relationship of Town and Country.

The selection of the title "Town and Country" for the paper is due to the author's conviction that we, as a nation, regard their relationship to each other as the most important factor in town planning. It is hardly necessary to hint that the average educated Englishman values the country far above the town, regarding the latter as a necessary evil, to be tolerated only on account of its uses in making a living, or for certain specialised and concentrated forms of amusement to be indulged in with moderation and within definite limits of time. This attitude is hereditary. The Saxons called the city "the grave of freedom," and when they took possession of our island destroyed the Roman towns and settled in small hamlets. This preference induces a neglect of the city in respect of anything beyond speedy and convenient means of intercommunication and of transit; and if these demands are fairly well met our typical Englishman is satisfied, not possessing sufficient imagination to realise the requirements of those whose lives are necessarily spent within the town or immediate suburbs. The activity of societies having for their object the preservation of those areas of our country possessing claims to special beauty or interest is sufficient proof of the strong national feeling on the question. As the result of this feeling, the importance of ordered dignity and grace in our towns has never been felt here as on the Continent, where the city has always taken first place in the minds of all classes. Valuing the country as we do, we can only consider our towns in their relation to their surroundings, and we shall as a nation devote more attention to this relationship than to the actual embellishment of the city itself. This axiom may not be endorsed by the architect; it requires, indeed, some effort to accept it; but it is by this route that the first advance will be made.

Proportions of Streets and their Buildings.

We, of course, recognise that a long and important street, particularly if straight, demands an effect of breadth in one form or another; but our present regulations indicate that we are far from appreciating what is a satisfactory relationship between the breadth of a street and the height of its buildings. The author had examined a number of thoroughfares that either fail or succeed in satisfying one's æsthetic instincts, with the result that he believed it possible to lay down the following rough-and-ready rule—viz., that the height of the buildings should not exceed two-thirds of the width between them, unless it is at least one and a half times this width. Any proportion between these is unsatisfactory, though less so in the case of irregular streets and with buildings having broken sky-lines. Now the narrow proportion is unsuited to residential districts, and therefore the former one should be the limit; but in closely built commercial areas there will doubtless be many streets of the narrower type, though in our climate it would be well to avoid them on an alignment east and west. If such a narrow street exist, every effort should be made to open it up to the sun on the south side by recessing frontages and reducing heights of buildings at certain points.

With the object of treating the question in an orderly and definite manner, the author asked his hearers to transport themselves a short distance into the future, and to regard as materialised some of the aims and aspirations that are engaging our attention at the present time.

Ten Years Hence.

Let us in imagination start out some ten years hence from the business centre of one of our larger provincial cities, passing in turn the buildings devoted to government, to recreation, to education, and to various types of residence, till we arrive at the outermost limits. We drop down the lift from our office, and emerge into one of the narrower streets. No very great difference is noticeable in these, except that within the business centres they are entirely given up to pedestrians, no vehicles being permitted there between the hours of 8 a.m. and 8 p.m.; while in the wider streets only light cabs are allowed, the large and heavy vehicles of the public service being confined to a few main arteries, and no goods traffic at all is to be seen at this time except light vans that are certified equal to a pace of ten miles per hour.

Before starting on our route towards the south-west we will take a few steps eastward to look at one or two of

The Great Warehouses.

Some eight years back (in the year 1901, I believe) the congestion in this area compelled our municipality to appoint a traffic commission, which reported that to remedy adequately the existing state of things new thoroughfares were needed at an estimated cost of near four millions; fortunately, before any practical steps were taken, the Chamber of Commerce sent a committee of investigation to Chicago, and then, bringing all the traders into a syndicate, extended the terminal of the great main line to the East Coast docks, by means of radiating tubes in reinforced concrete some forty feet deep, which communicate with every warehouse in this section by means of lifts. The city contributed two and a half millions to the scheme, holding bonds to this value, and the economies effected have resulted in a great expansion in the trade of the town. The old streets have proved adequate to the retail business, but it is enacted that in ten years' time each owner will have to provide standing room on his own premises for vans loading and unloading.

The Collecting Road.

We will turn our steps towards the south-west, this being the shortest route to the collecting road that encircles the business area. When starting the improvements, it was felt that such a road was desirable, and it was carried through the districts just going out of use for residential purposes. It has been almost entirely taken up by shops and hotels, while there are also three theatres facing into it. Considerations of cost did not admit of this street being expended into a boulevard, but fortunately two large squares are in close proximity, and they are linked up to it by broad avenues. At the point where we reach this zone, a space has been cleared for the municipal group; this was formerly the site of the workhouse, with the addition of two acres from the churchyard of the Georgian church you can just see standing back between the town hall and the law courts.

You have doubtless been disappointed hitherto at not having seen more study of

Decorative Effects

in our streets, but it was considered that the stress and rush of business detracts from the likelihood of a proper appreciation of such embellishments. In this square, however, you will realise that we have not been neglectful of our monuments and their setting; the rise in the ground has enabled us to place the city hall on a podium carrying several important groups of sculpture that complete the scheme of the sculpture on the building itself. The advisory committee of architects has always recommended that all monuments should be so placed so as to be seen only against a suitable background, and that if possible they should form part of the composition of a building or group of buildings; for example, you see the memorial museum in course of erection between the square and the little public garden to the north. The centre bay of the loggia will frame in a statue.

The Plaza.

Three examples of the closing in of the public place, as strongly advocated by Camillo Sitte, were cited. The first, from Nancy, shows the buildings connected by semi-circular loggie; in the second (the Plaza de Commercio at Lisbon) they are skilfully linked up by a triumphal arch; while in the third the desired effect is produced by the closing of a short vista with a building designed in harmony with those fronting on the *place*. This last has the advantage of being both more subtle and more practical than the other two, though, of course, there is room for the adoption of any of these three solutions, not to speak of a fourth in which the planting and massing of trees would take an important part.

Passing on from the lines of the square to its decoration, we may notice a few views of

Sculptured Monuments and Fountains,

particularly studied with regard to their surroundings. From these we may turn our attention to sculpture treated in direct relationship to an architectural composition.

It is time we continued our route towards the outer suburbs, but we have yet to pass through a zone mainly occupied by residential hotels and the better class of tenement blocks, inhabited by those whose disposition or whose employment leads them to prefer this type of dwelling. These have mostly been built during the last fifteen years, and we were enabled to put in force by-laws regulating the cubic amount of building that might be put on a given area, and thus secure good gardens and open spaces between the six- and seven- storey blocks. Though the gardens are not all public property it has been found convenient to place them in the charge of the municipality.

A few hundred yards further we reach one of our most important undertakings—

The Great Water Avenue.

You will remember our river, a turbid and tortuous little stream, of which by no stretch of the imagination could one be proud. Here it came within a hundred yards of the main road, and then burrowed away under the railway goods yard to the north-west, returning again under the line about a mile further on, just where the open country used to begin. This long loop was hopeless—in addition to two tunnels under the railway, there were three or four factories, the appearance of which destroyed all chance of doing anything with it; at the same time it was felt that it would be a fine thing to make a river a feature in the design of the city and to provide a convenient location for water sports. As there was but a strip of less than a hundred yards between the main road and railway a landscape treatment was obviously unsuitable and the straight canal almost suggested itself.

At the city end a circle a hundred and fifty feet in diameter is surrounded by a raised terrace formed by the boathouses, etc., with a terminal and two flanking monuments; from this there is an uninterrupted stretch of over three-quarters of a mile with two bridges, and then a wider basin surrounded by an embankment terraced to give a view of the finish of races and of the water sports usually held here. On either side is a double avenue, and beyond this lies on the one hand the thickly planted mound screening the railway, and on the other a narrow garden abutting on the main road. The straightening of the road formed part of the scheme, and this giving a series of irregular strips on the other side, the readjustments afforded the opportunity of providing an enclosed garden which helps to balance the effect of the water avenue on the opposite side of the road. This garden is gradually being ornamented with monuments illustrating the principal events in the history of the city.

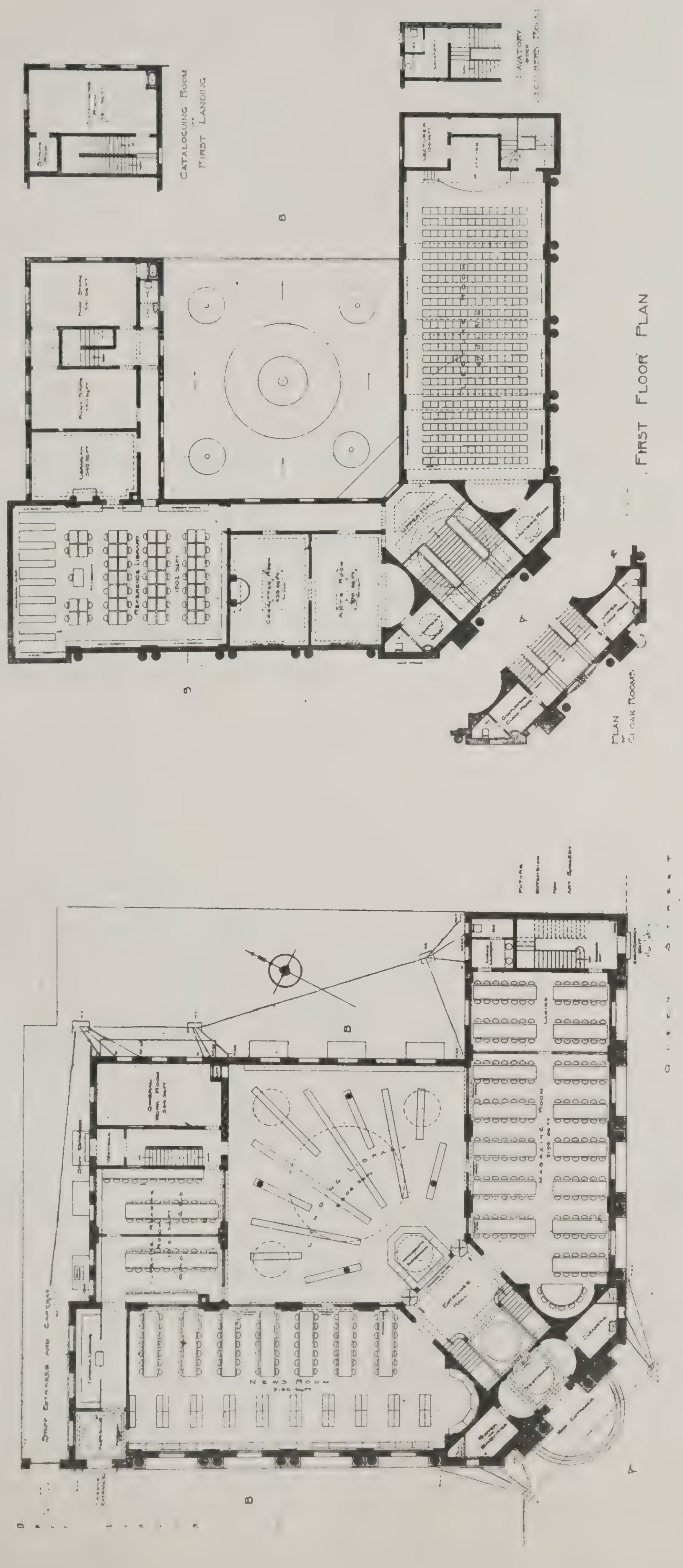
The other

Main Avenues Out of the Town

are very varied in their character, more than half are the old highways that were in many places far too narrow for the traffic that

---

*Abstract of a paper read before the Royal Institute of British Architects by Mr. H. V. Lanchester, F.R.I.B.A., 5th Feb., 1909.



BLACKPOOL CENTRAL LIBRARY COMPETITION: ONE OF FIVE DESIGNS BRACKETED FOR SECOND PLACE. THOMSON AND BRISTOW, ARCHITECTS.

streamed through them. We began by widening there.

The University Group.

Following our water avenue, we reach, on the south side of the road, the university and group of buildings in connection with it. These have undergone extensive remodellings in recent years, largely due to a revolution in the views of our educational body. This change of ideal has brought about a marked alteration in the character of our university and allied buildings. Bodily training has not, of course, been forgotten, and the provision of a campus has given the opportunity for a broad and dignified piece of architectural composition in the buildings grouped round it, while the position selected for this section leaves in quiet seclusion the avenues and lawns allotted to the more meditative students. Of course, we could not adopt the grandiose lines of the newer American universities, such as those of California and Pittsburg, and our national instincts are against working on quite so large a scale, but we have obtained valuable hints from these more ambitious schemes. Immediately beyond the university group is placed the new museum, of which one might say much did time permit, and beyond this lies the park devoted to zoological and botanical collections. In this park are built up various large-scale geological models designed to give effects approximating as nearly to the real thing as possible. This park forms one of the series of inner parks all within two miles of the heart of the city.

When the problem of **Arranging a Park System** first arose, opinion was divided into two sections, and discussion ran high for some time, one party taking the view that the traditional type of the English park should be adopted, and the other that all natural characteristics should be preserved and maintained, and that the sharpest possible contrast should be presented to the artificiality of the city, all boundaries extending far enough to make the landscape complete.

Thoroughfares and Parks.

We usually endeavour to avoid running important thoroughfares in juxtaposition to parks and gardens, the main approaches being reserved for the park only and not forming part of the scheme of communications. Passing from these to the larger and more remote parklands by means of the aforementioned parkways, we may note that the latter vary considerably in character; in some cases we have provided a boulevard parkway with electric tramlines on which a specially aranged service is run on Sundays and holidays; others have footways merely, through selected strips of country retaining as far as possible a rural character; and thus at a minimum of expense all classes of patrons are brought in touch with the places of recreation.

The proportion of the country now laid under contribution to provide open spaces for our cities makes it obvious that the time is rapidly approaching when the whole of England will for this purpose be divided into spheres of influence more or less under the control of the great centres of population, much as the land has already been divided up for purposes of water supply.

The river itself has been but slightly altered, except by the addition of the necessary weirs and boatslides to render it navigable. There is fortunately but one factory abutting on it within the next few miles; this building has recently been remodelled by one of our leading architects, so that it presents a good appearance from the road, and its two pearl-grey concrete shafts are not ungraceful.

Two miles further on we come to the largest of **Our Suburban Villages,** already a town of some 5,000 inhabitants when our improvement scheme was started. As the high road narrowed considerably here we had again to resort to duplication, which was the more necessary by reason of the facts that the old church and a particularly fine group of almshouses faced each other at a distance of only thirty-eight feet, and that there were, moreover, several particularly fine Georgian houses demanding preservation. This old high street is throughout full of charm which any widening would have entirely destroyed; it has but one serious blot in that group of a dozen shops, the work of a speculative builder some eight years back—they are too substantial to pull down, but they are now to be refronted at the expense of the city, with the consent of the owner. The design for the front is the subject of a competition between the most successful graduates in architecture for the past six years, and it is quoted as an example of the way in which our authorities are endeavouring to open the way to secure public appreciation of the best talent in our younger men.

Beyond one of the village suburbs, of which there are many, we come out into some broken common, and on the further side of this we reach the limit of our operations in this direction; the course of the river has been dammed to make a spreading lake, and beyond it is a thickly planted stretch of wood, a favourite picnic ground in the hotter days of summer. Over this you can see, away to the north-west, the long ridge which is included in our largest rural park, and from which vantage point you can obtain the well-known view over six counties. Here we may terminate our excursion.

"In this imaginary description" [of which a great deal has been reluctantly omitted, for want of space], Mr. Lanchester added, "I have endeavoured to be thoroughly practical and to suggest nothing that would not be easily within the powers of any of our great municipalities if once they can be got to realise the desirability of such an achievement. How far I have succeeded in this aim I must leave it to you to decide."

Discussion.

Mr. F. W. Speaight said he was sure they had all followed with great interest the imaginative journey on which Mr. Lanchester had conducted them, but he was afraid that the conception was too lofty for realisation. All such schemes should be accompanied by a financial statement, in order to convince the man in the street of their business character.

Mr. W. H. Lever, M.P., said he believed that England's backwardness in regard to town planning was due to a great extent to unfamiliarity with the examples in other parts of the world. With the exception, perhaps, of Edinburgh, he believed that there was not in England a single admirable example of town planning. If they kept their ideals before them, he was confident that it was simply a matter of time before they would be able entirely to transform and improve the character of many towns, without incurring any overwhelming burden of expense. If, however, the reform was desired at once, it must necessarily prove a costly matter. The education of the town councillor was most important. The ignorance of the average town councillor was surprising, but perhaps was natural, considering his restriction of outlook. If centres such as Liverpool would take up the question of town planning, he was certain that enormous progress would be the inevitable outcome.

Mr. Andrew Taylor, L.C.C., regarded the paper as a delightful romance, and he sincerely hoped that the time would arrive when Mr. Lanchester would have the opportunity of realising the ideal so admirably conceived. Those who went to Vienna last year must have realised how much ahead of London that city was in regard to town planning. He believed that the movement was receiving helpful support in England, and he understood that Mr. Lever had offered a sum of money to be devoted to the education of students in this important subject.

Mr. Raymond Unwin fully believed that there was nothing useless in schemes which might be described as being "in the air." He felt confident that such schemes would have the effect of stimulating new work. They should not lose sight of the fact that the German departure in town planning from what was known as the "grand manner" ha dresulted in work too much niggled and worried. Too little attention, he was certain, was paid to the necessary widening, when improvements were contemplated. They had at Finchley Road one of the most important avenues leading from London; and yet a double row of tramlines was being laid without any widening, which meant that at some future date a much larger expenditure would be involved than if the necessary alterations were made now. He believed that a great end would be achieved if suburban authorities could be convinced of the desirability of building in groups—this necessitating the grouping of gardens also—instead of the method that at present prevailed.

Professor C. H. Reilly observed that a serious responsibility rested with him by reason of the fact that Mr. Lever had entrusted him with the project which had already been referred to. He could see that if the desired end was to be attained the architect would want a much wider scope from the outset. There existed a serious obstacle in the form of the borough surveyor, who would have to be taught to what limits his functions extended. He felt deeply indebted to Mr. Lanchester. He, with many others, had looked at Cardiff with a respect approaching to reverence; and they now realised that not only was he a true architect, but also a man who could dream dreams.

The vice-president, Mr. Edwin T. Hall, having briefly summed up the discussion, delivered himself of a eulogistic description of rural Dulwich. Nowhere within 200 miles of London, he asserted, was there a more beautiful and truly ideal spot. Its ancient college and interesting picture gallery were well worthy of a visit, and he advised all who had not experienced that pleasure, to do so at their first leisure moment.

Mr. Lanchester briefly replied.

THE THREE CHURCHES OF ST. PAUL.

By Mervyn E. Macartney, F.R.I.B.A.

At the meeting of the Liverpool Architectural Society held on February 1st, Mr. Mervyn E. Macartney delivered a lecture on this subject to a large assembly. In the absence of the president, Mr. F. G. Eccles, F.R.I.B.A., the chair was taken by Professor Reilly.

The first, or Saxon, cathedral, originally standing on the site, was destroyed by fire in 1085. The second, or Norman, cathedral, was founded in 1087.

In 1240, the choir was rebuilt or enlarged by being extended over the site of the church of St. Faith, which stood at its south-eastern corner, and to the dispossessed parishioners of St. Faith, a place of worship was granted in the crypt under the enlarged cathedral choir. Old St. Paul's represented a variety of styles from Early Norman to Decorated. It consisted of a nave 290ft. long, of twelve Norman bays, and north and south transepts of five bays each.

The cloisters, which were of small extent, stood in the angle formed by nave and south transept, and the chapter-house was situated in the cloister garth.

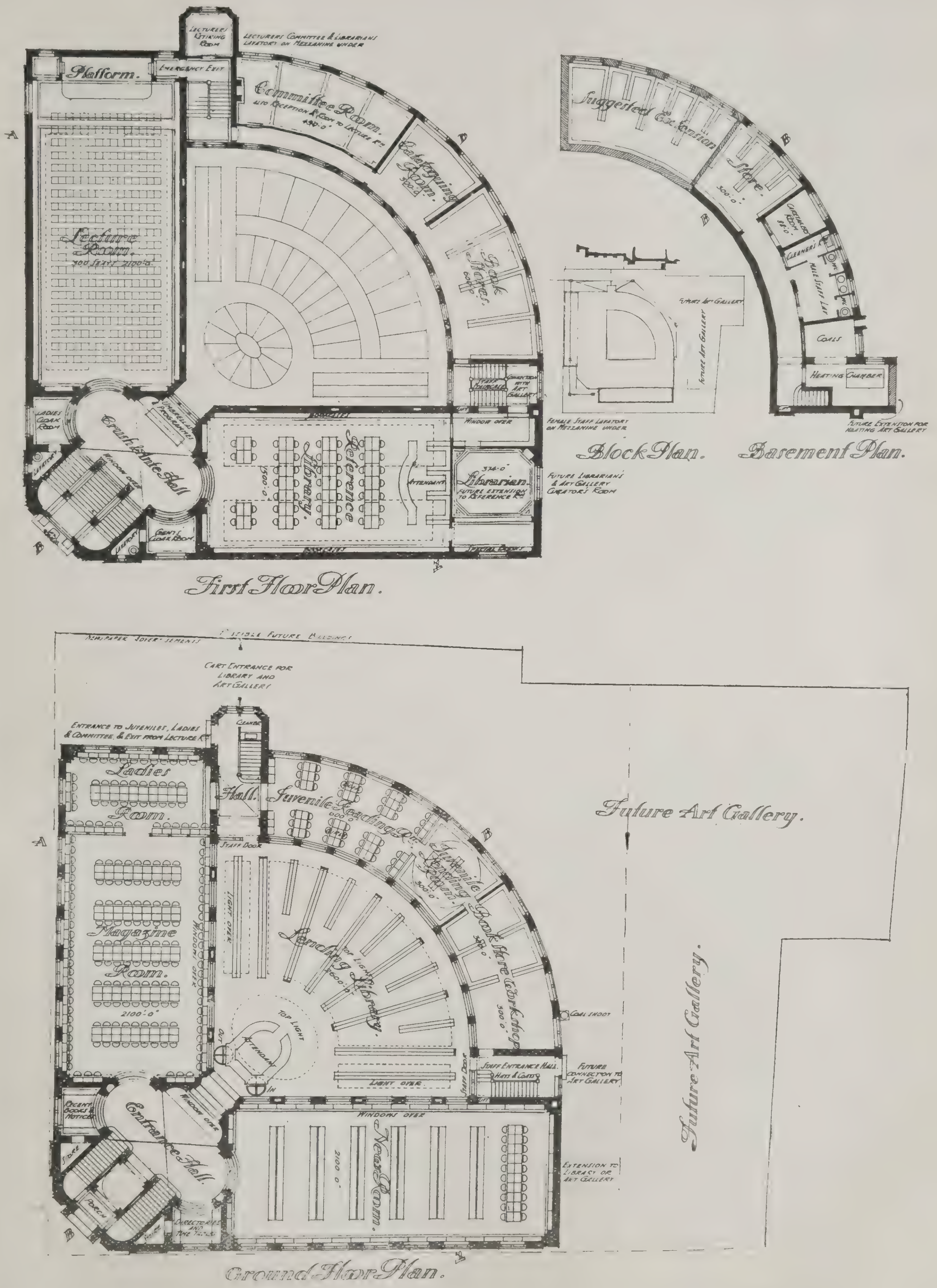
The fine Early English tower, which had a timber spire covered with lead, was built about 1315, ad destroyed by fire. It was rebuilt without spire, at which period the curious and remarkably bold flying buttresses were probably added.

The choir extended to twelve bays, and at the eastern end was a large rose window of superb tracery.

The nave was much used as a fashionable lounge, and even as a business exchange, until the latter part of sixteenth century or

---

*Abstract of a lecture delivered on February 1st, to the Liverpool Architectural Society by Mervyn E. Macartney, B.A., F.S.A., F.R.I.B.A., Surveyor to the Fabric of St. Paul's Cathedral.



BLACKPOOL CENTRAL LIBRARY COMPETITION: ONE OF FIVE DESIGNS BRACKETED FOR SECOND PLACE.

H. R. GARDNER, ARCHITECT.

beginning of the seventeenth century. It became known as "Paul's Walk," from the fact that about the centre of the nave there were doors immediately opposite each other in the outer north and south walls, these forming a ready means of communication for foot-passengers, who were spared the trouble of walking round the eastern or western ends of the cathedral; and so this passage came to be looked upon in time as a regular public "right of way."

King James I. was present on Sunday, March 26th, 1620, at divine service, when the Bishop of London preached a sermon from Paul's Cross, which stood on the north-eastern corner of the choir. At the subsequent banquet, it was agreed to issue a commision to raise money for carrying the repairs to the cathedral into execution. Inigo Jones was afterwards employed to erect a portico at the west end of the cathedral. A view of this portico, taken from old drawings of the period, was projected on the screen, and proved to be of somewhat curious design, in Corinthian Classic. Strangely enough, this portico was added not so much for any religious purpose, but more in order to relieve the congested state of the business operations carried on at the time in the nave, which resembled a market.

Sir Christopher Wren was then called in. Wren was born on October 20th, 1632, at East Knoyle, in Wiltshire, of which place his father was rector. In addition to being a master architect, Christopher Wren was an exceedingly clever scientist, mathematician, and astronomer. At the point mentioned, Wren proposed to take down the Gothic arches of the old cathedral, and substitute circular ones in Classic style, and to erect a Classic dome in place of the Gothic tower. The Great Fire of London occurred in 1666, before his intentions could be given effect, and that fire destroyed the chief part of the building and irreparably damaged the remainder.

The vast magnitude of the work, and the contemplation of the great expense requisite for building a new cathedral, caused a lapse of some years before it was finally determined that all attempts at "patching up" were hopeless. A commission was eventually appointed (in November, 1673) having authority to superintend preparation of plans for rebuilding the cathedral; and a preliminary design having been approved by the King, His Majesty issued a warrant on May 1st, 1675, for the commencement of the works.

The demolition of the old buildings took nearly three years to complete, and was not accomplished without much difficulty and danger; but, with the aid of gunpowder and battering rams, the last stone was laid low, and the foundations of the new fabric were commenced. These probably began at the east end, and were carried westward, owing to the fact that at the west end of the site Wren had erected a temporary chapel before commencing his new foundations. The original design prepared by Wren, and known as his favourite design, was a magnificent conception, by some still thought to be even superior to the building now erected, but it was rejected by the King on account of its "unecclesiastical arrangements." The model of this design is preserved in the cathedral library.

Wren subsequently prepared a revised design agreeable to the King's ideas and wishes. This, however, showed a sad falling-off, much to Wren's own disappointment. However, the opportunity having arisen to make some slight revisions in this design, Wren was strong man enough to prepare an entirely new design throughout, which is represented by the present structure. In planning the new cathedral, Wren changed the axis from that of the old cathedral, in order to get rid of the difficulty which would have been caused by building on the site of the old walls, whose foundations were known to be defective, and so to break perfectly fresh ground for his new foundations. Wren also prepared a magnificent scheme for improving the approaches to and environments of the cathedral, but it was not accepted, and the building was eventually enclosed by cast-iron railings on a stone base. These railings were subsequently removed on the western side.

Sir Christopher, though sadly hampered at the last through the jealousy and perverseness of his committee, fortunately survived to see the completion of his great masterpiece in 1710, and died on February 25th, 1723.

On the termination of the lecture, a vote of thanks was accorded to Mr. Macartney, on the proposition of Mr. Edmund Kirby, F.R.I.B.A., seconded by Mr. Blackburne.

GROWTH OF DESIGN IN WOODWORK.

Mr. E. Guy Dawber, F.R.I.B.A., delivered on Wednesday week last at the Carpenters' Hall, London Wall, E.C., a lecture on woodwork, one of a series instituted by the Carpenters' Company with the object of stimulating an interest in craftsmanship.

The use of woodwork in this country, he said, is more varied than in any other, and certain buildings erected by our ancestors are noted for the beauty and variety of their woodwork. He drew attention to the fact that Gothic woodwork is always of an ecclesiastical type, and that a marked similarity exists between the details of stone and woodwork, for in those days the simple pattern of the stone mason did very well for the carpenter. Their timber roofs exhibited a fertility of design and variety of construction truly amazing. Taking the various types of roofs, he enumerated the king-post roof with its two rafters, tie beam, king-post and curved braces; the hammer-beam, typical of the eastern countries; the trussed rafter roof, and the wagon roofs of the West of England. These types were illustrated by characteristic examples. Amongst them, and especially noticeable was an interior of a barn at Harmondsworth, Middlesex (from a sketch by the lecturer), with side aisles, also the roof over Westminster Hall, which he said was one of the earliest and was the most magnificent example in the country.

Passing on, he pointed out the resemblance to stonework of a wooden screen at Cambridge. The use of timbering for the construction of buildings was very common, and, in the parts of England where timber abounded, was always adopted. The filling-in only was of brick, or other material. Where we find the timber uprights placed close together, we may take it as evidence of old work, as in the later work the timbers are spaced more widely apart.

There are marked characteristics in the decorative forms of the timber-work of the West, as apart from the East. In the West, we find the curved braces (and other elaborate detail) which, it has been suggested, were caused through the oak trees being beat by the prevalence of the winds, and hence the distorted forms. Timberwork in the West is generally coarser and cruder in form than it is in the East, and Professor Blomfield attributes this to the influence of the Flemings. The treatment of floors and ceilings should not be overlooked. They were generally formed of large square beams, resting on wooden plates. These, filled in with plaster and wood, formed the ceilings, and a great many examples are to be found in Sussex. In other cases, the under sides were covered with boarding, and crossed ribs, the intersections of which were marked with carved bosses, bearing coats of arms, etc. Many bear evidence of having been coloured, a favourite treatment being gold stars on a blue ground.

Doorways were frequently the object of the craftsman's art. At first they were simply upright boards, studded with nails, and fixed to braces. Then, later, we find them decorated with tracery planted on to imitate the tracery of the windows. The doors of the 13th and 14th centuries were quite plain, and they relied on the beautiful wrought-iron hinges, which in some cases almost covered the doors, for decorative effect. Some delightful illustrations of doorways were shown, including porches at Oxford, and Wembley in Shropshire, also Moreton Old Hall.

Walls were usually decorated in one of three ways, either (1) by panelling, (2) by hanging the walls with tapestry, or (3) by painting. Before the sixteenth century, the panelling followed the Gothic style, the framing consisting of 4in by 3in. uprights, placed from 1ft. 6ins. to 2ft. apart, with cross pieces about 5ft. apart. The upper part of the panels was usually decorated with tracery, etc. The mouldings were carved on the solid, and this is the case at Haddon Hall, the mitres being simply masons' mitres. The panels themselves gradually became plainer and simpler, the monotony being broken up by pilasters, sometimes with semi-circular arches over. The first appearance of Classic detail seems to have been in the middle of the sixteenth century, in the reign of King Henry VIII., and it first shows itself in Wolsey's palace at Hampton Court. The screen at King's College, Cambridge, was shown, and the date of this could be definitely fixed between the years 1632 and 1636. The design, treatment, and detail, were thoroughly Italian in character. It was, however, an isolated example, and had no influence on the work of the time. After the Italian influence died out, we find the influence of the Flemings made itself felt. They seem to have favoured the East Coast, and although the general effect of their work was good, the details were crude and grotesque. Some of the finest specimens of the English type of work are to be found in the halls of our colleges, and in the large houses. Examples were shown, including Knowle, Kent, and Wadham College, Oxford.

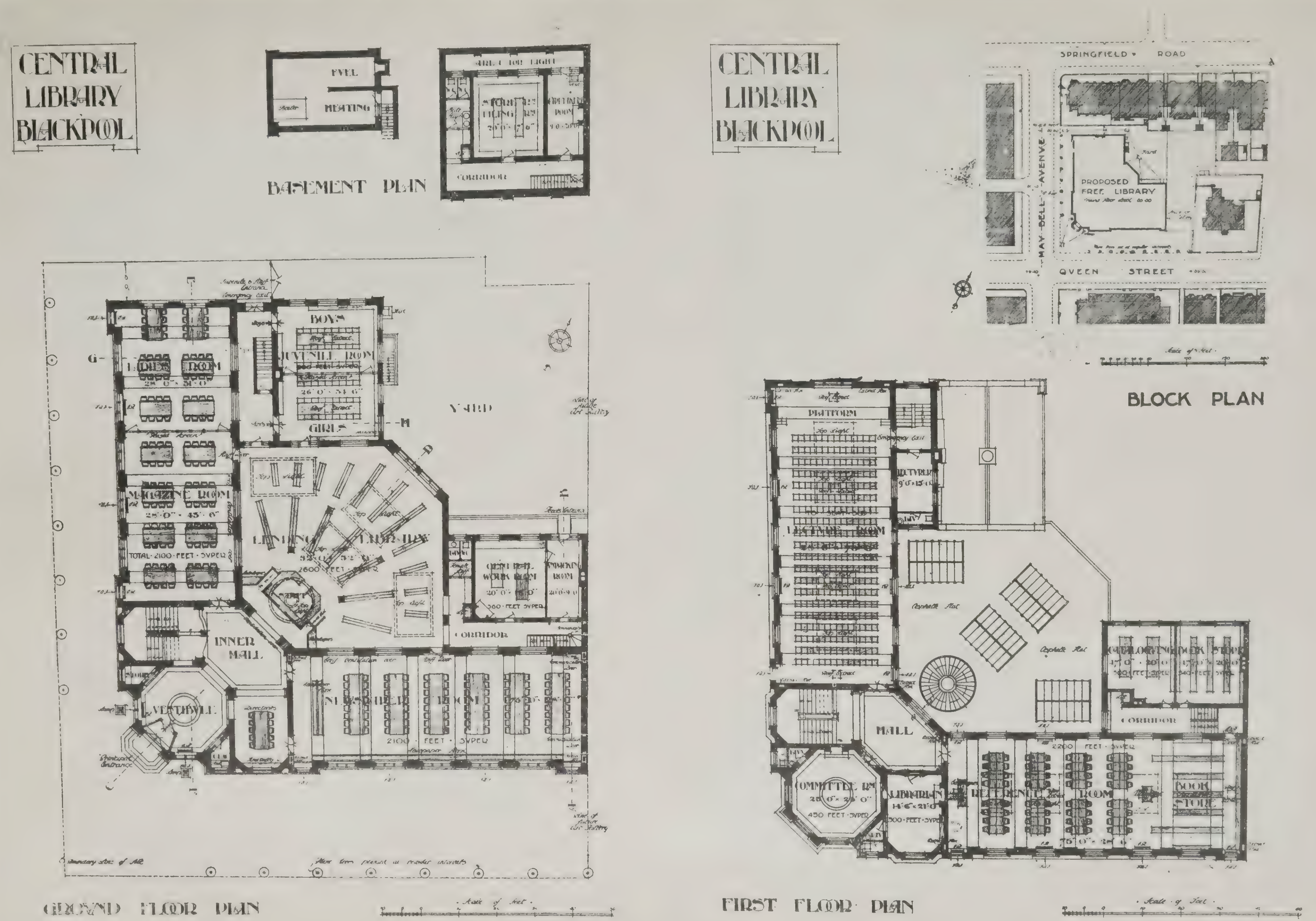
The commencement of the seventeenth century saw the last of the rich roofs and old ceilings, and plaster ceilings took their place. As the seventeenth century waned, the German influence died out.

With Inigo Jones came a broader and more scholarly type of design. The construction, though Classic in form, was admirable, and well suited to its purpose. The woodwork followed the architecture, and was part of it. Sir Christopher Wren gathered round him a school of craftsmen, and whether their work was in oak or deal, one style and one tradition permeated it. Types of this were shown, namely, choir stalls, etc., at St. Paul's, the Skinner's Hall, the Board Room of the New River Co.'s offices and the room from Clifford's Inn, now in the South Kensington Museum. Having briefly alluded to many other examples of this period, the lecturer said that in the beginning of the nineteenth century, and with the Victorian era, architecture was at its lowest ebb, and woodwork followed it. The two are inseparable; they always have been and always will be.

The German Emperor has conferred on Mr. John Singer Sargent, R.A., the Order Pour le Mérite.

* * *

In Mr. H. T. Buckland's paper on Schools, reported in this issue, it is stated that "Low pressure hot-water is still so dear to the hearts of many that one is loth to disparage an old friend, but it will, I think, generally be found difficult to obtain really adequate heating in conjunction with a proper air supply without resorting to some more rapid system of circulation." Messrs. J. F. Phillips and Sons, heating engineers, of 21, Old Queen Street, Westminster, and of Brighton, are at present installing in several schools the cable system of vacuum hot-water heating, which is a low pressure system, and the circulation of which can be worked at about 20 times the rate of the ordinary low-pressure systems.



BLACKPOOL CENTRAL LIBRARY COMPETITION: ONE OF FIVE DESIGNS BRACKETED FOR SECOND PLACE. C. H. POTTER, ARCHITECT.

PLANNING OF SCHOOLS.*

By H. T. Buckland.

(*Concluded from page* 140, No. 732.)

Ventilation.

If the planning of elementary and secondary schools does not present many points for great differences of opinion upon general principles, and in the main I think it does not, one has not far to seek for matter to provide quite adequate discussion. If I thought any heating engineers were present, I don't know whether I should have the courage to mention the word "ventilation" for fear of the discussion I might provoke. I want, however, to touch upon it from the point of view of the architect, and not of the expert. Of its importance there can be no question, since the only real departure from accepted methods of school planning owes its origin to a desire for a natural system of ventilation. I refer, of course, to the Staffordshire school already mentioned. The question at issue appears to be whether efficient ventilation can be secured for comparatively crowded rooms without the employment of mechanical agency.

Dr. Reid, the county medical officer for Staffordshire, maintains it can, others that it cannot. Whether each the mean the same thing by efficient ventilation is open to doubt, if we define it as "an adequate supply of fresh air of a proper temperature, admitted in such a manner as not to cause a perceptible draught." Sufficient movement to obtain a change of air in a room is the main essential in any system of ventilation, and whatever means may be employed must be directed to this end.

Dr. Reid's Contention.

In the case of the Staffordshire schools, the movement of the atmosphere is relied upon to effect the necessary change, and a through draft is facilitated by means of open windows on both sides of the rooms, in addition to a ventilation grating at the back of the heating radiators; the windows are so arranged with a hinged, glazed screen at the base, which, it is claimed, gives an upward direction to the entering air; and the same arrangement serves for exhausting the vitiated air, the window on either side acting as an inlet or outlet, according to the direction of the wind. Time will not permit me to go into all the claims made by Dr. Reid in support of the type of plan he advocates, his main contention, however, to quote from his report, is: "That if the central hall type of school is to be maintained, it is only by employing mechanical means that anything approaching adequate ventilation can be obtained, and even with such means the result is not satisfactory; and that the solution of the question is to be found in the plan which is described as the Staffordshire type." Whether such a plan as this is, as Dr. Reid claims, "quite compatible with educational requirements," is open to question. One central hall for three departments, of necessity, as was pointed out to me by a prominent educationist, does away with the morning assembly of two of the departments, and the need for a headmaster and mistress as such almost disappears if their personal intercourse with the children is reduced to a minimum. It is open to discussion whether such a sacrifice is worth making on the assumption that a satisfactory method of ventilation cannot be secured even by mechanical means in a school planned with the class-rooms round a central hall. Dr. Reid remarks: "All systems of mechanical ventilation, moreover, present a shocking object-lesson to the children from their inherent need for having all windows permanently closed." So far as the "Plenum" system is concerned this is true, and the argument is a weighty one against its use. Personally, I have found a majority of the teachers in "Plenum" ventilated schools adverse to it, and this is particularly the case with lady teachers.

The Plenum System.

Bearing upon this question, the opinion of Mr. Felix Clay, architect to the department, as recently given in evidence before a consultative committee appointed by the Board of Education, will be of interest:—"The 'Plenum' system has many strong supporters, who are able to show that, chemically, a fairly pure atmosphere is maintained by it. Mr. Clay, however, was strongly adverse to its use for school purposes. In the 'Plenum' system warm air is introduced under pressure into the upper part of the room; this being at a higher temperature than that already in the room, spreads over the ceiling, and being under pressure, produces a gradual downward movement, passing out of the room at the floor level. Certain objections to the system are the warming of the rooms by hot air only; this requires raising the incoming air to a temperature that seems to destroy some of its invigorating qualities and produces a somewhat enervating effect. Perhaps the chief objection is that, for the proper working of the system, it is absolutely necessary to keep the windows closed, and, in order to ensure this, the windows are not, as a rule, made to open; this has a very serious disadvantage in accustoming the children to sit in rooms with the windows shut." Any system which meets with such strong condemnation from different quarters will find it hard, I think, to endure. One has not far, however, to seek for an alternative, which appears to provide the advantages of a natural system with open windows, without necessitating the abandonment of the generally approved central hall type of plan, a system of mechanical extraction will, I think, be found to meet the case. Such a system is practically the reverse of the "Plenum"—the foul air being sucked out, and the fresh air drawn in, instead of the fresh air being pushed in, forcing the foul air out. This system was employed in the secondary and elementary schools at Rotton Park, previously shown. In that case, fresh air is admitted to the various rooms by means of gratings at the back of the radiators, and through the windows, in which the lower portions open as hoppers and the upper casements swing; the foul air is drawn from the rooms through a grating fixed in a riser extending the whole width of each classroom, this riser is in front of a duct which communicates with the main underground ducts all running to the extract tower, at the base of which are fixed two large centrifugal fans driven by electricity. In addition to the grating at the floor level, there is a small grating near the ceiling, at the head of a flue which communicates also with the underground ducts; this is for the purpose of drawing off the extra heat and fumes arising from the gas lighting. The whole of the windows may be kept wide open if required. No chemical tests have been made of the air in these schools, but so far as the evidence of the senses and the testimony of the teachers is concerned, I have every reason to be satisfied that it is such that both teachers and students find it stimulating and comfortable to work in. It certainly has the merit of being almost entirely under control. Doubtless satisfactory results have elsewhere been achieved by similar methods.

Methods of Heating.

Of the methods of heating at one's disposal, we now have many. Low-pressure hot-water is still so dear to the hearts of many that one is loth to disparage an old friend; but it will, I think, generally be found difficult to obtain really adequate heating in conjunction with a proper air supply without resorting to some more rapid system of circulation.

The various systems of forced hot-water circulation, although differing in method, all have the same end in view, viz., acceleration, and it seems obvious that the oftener you pass the water through your boiler the warmer you are likely to keep it, assuming your boiler can supply the requisite heat.

Atmospheric steam has been largely used of late years, and my experience of it in large buildings is certainly favourable, but my impression is that the tendency among heating engineers is distinctly in the direction of accelerated hot-water systems.

A weighty argument always advanced by the advocate of ventilation by natural as compared with mechanical means is the question of cost. Not only first cost, but also cost of maintenance. Ventilating engineers may have some reply to this; I have none, except that if efficiency is required it will need to be paid for. As regards the question of first cost, Mr. Clay, in the evidence already quoted, estimated the cost of installing the "Plenum" system at from £1,500 to £2,000 in a school of 1,000. I am inclined to agree with this, if the figures quoted represent the cost over and above a natural system, i.e., to say I consider the "Plenum" system adds from 30s. to £2 per child to the cost of a school for 1,000 children. A system of mechanical extraction such as I have described, adds less, as the size of the ducts does not require to be so great, or the finish so good as in the case of the "Plenum." This naturally brings us to the whole question of cost of school buildings.

The Question of Cost.

My own experience is that an elementary school cannot be built for a reasonable number, say, from 750 to 1,050, at less than £10 per head; and to achieve this the site must be level and have a good foundation. The school at Acocks Green, which was shown, will cost, I understand from the architect, rather less; probably not more than £9 15s.; but this is an exceptionally large school, and has classes each for sixty children. One education authority in the Midlands which has promoted several recent competitions, allows £14 per head; for this, I think, a very decent school may be expected, if no mechanical system of ventilation is required. Of course, a good deal depends upon whether a school is in two or three departments. Ten pounds per head for a three department school is very low.

The Staffordshire schools in three departments, but with only the one central hall, cost £10 10s 4d. per head.

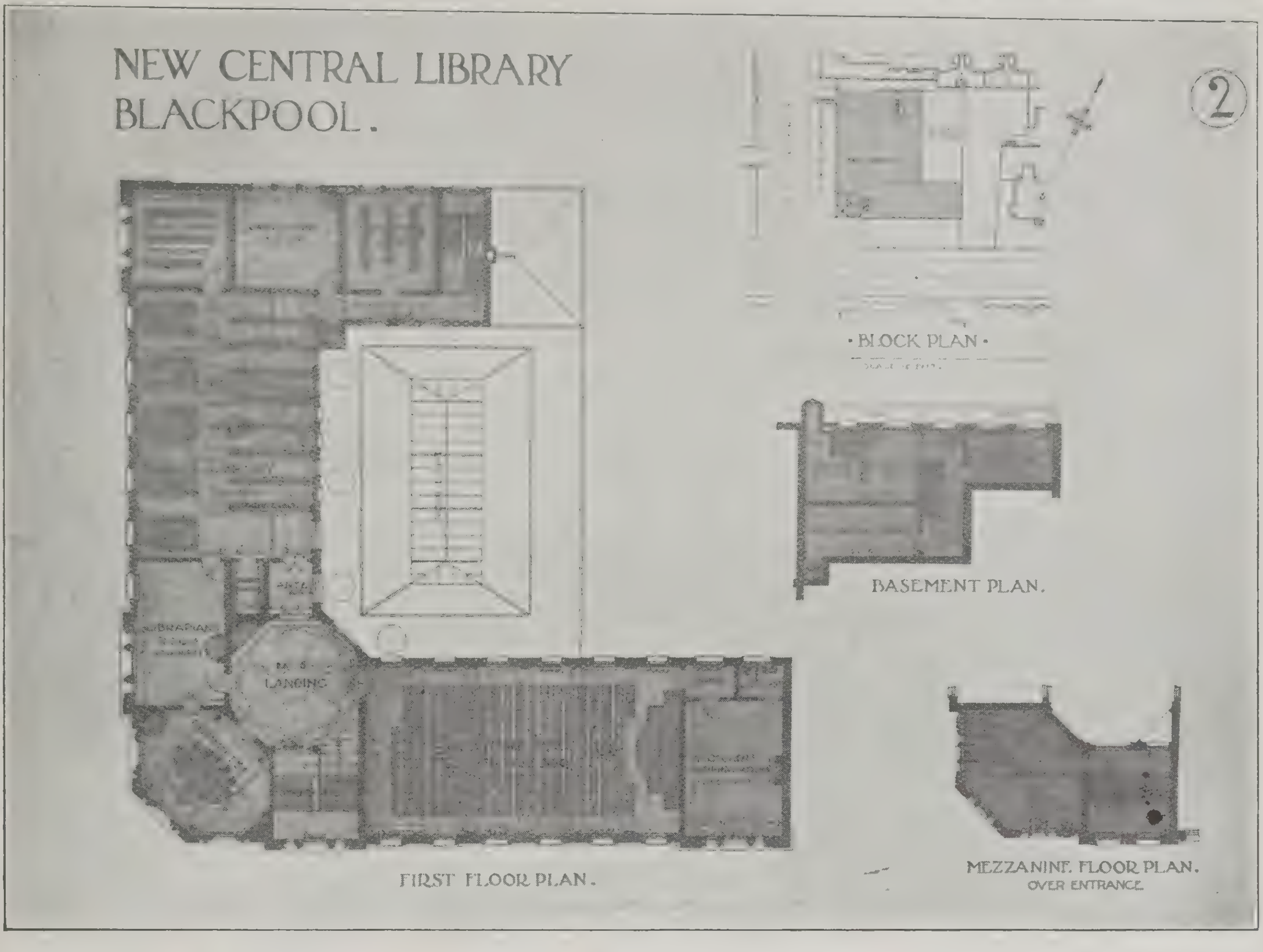
Of "Plenum" ventilated schools I know of one in two departments which cost £15 per head. A really well-built school with three departments and three central halls, a mechanical system of ventilation, and some regard to an architectural treatment in design and materials, cannot, I think, be built for much less than £17 per head For that amount boundary walls, 14in. thick, or walls and railings all round the site, and a caretaker's house, may be expected to be included.

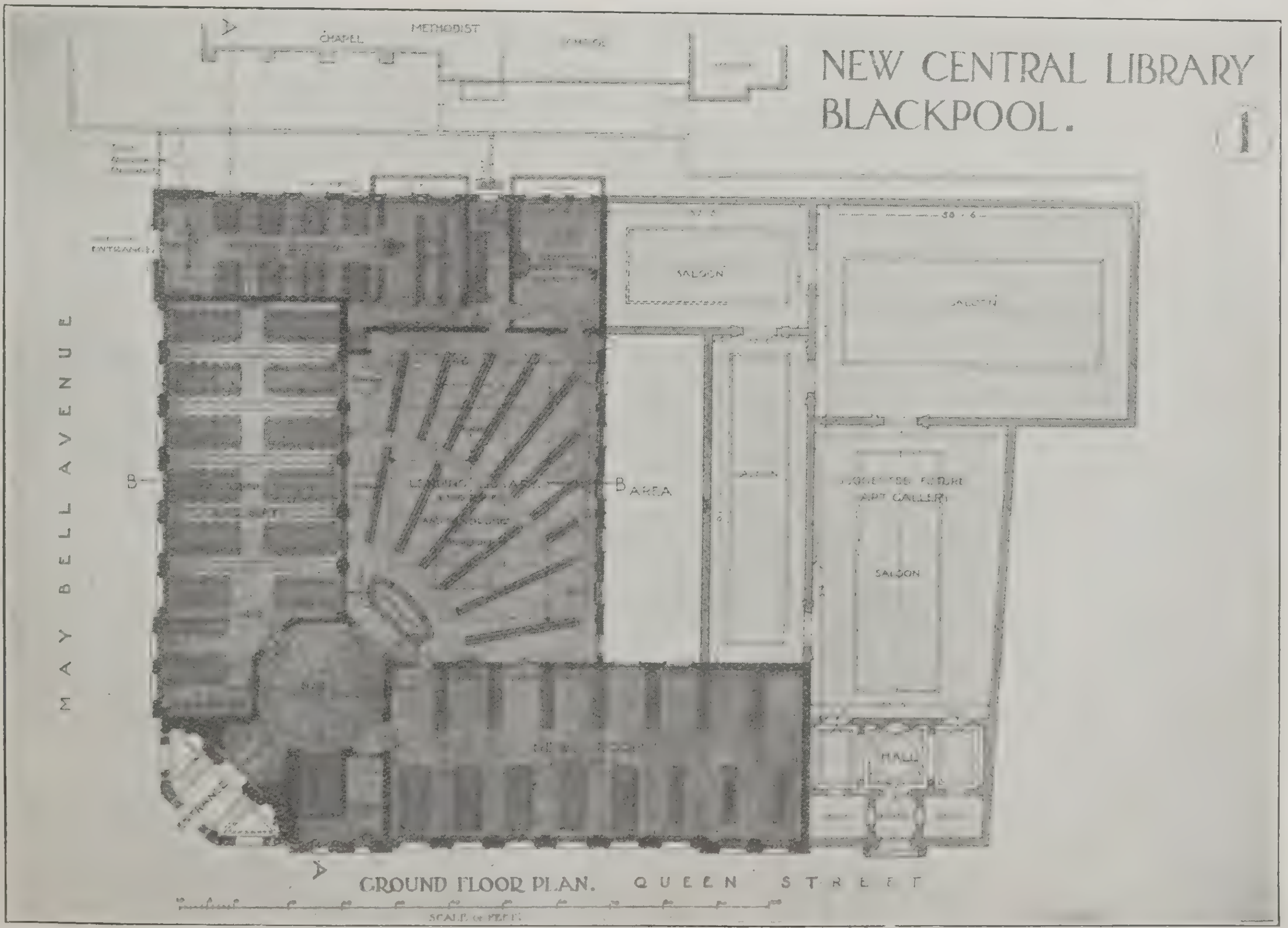
Cost Per Foot or Per Head.

These figures represent prices per foot cube, ranging from 5½d. to 7d., and as boundary walls and play-grounds are included in the prices mentioned per head, these items have to be priced separately and added in making up an estimate. In discussing the cost of secondary schools, I find myself at variance with the accepted method of pricing at per head. In elementary schools, given a certain number, there will not be much variation in the size and number of the rooms; but in a secondary school, although the number of class-rooms and children accommodated may be the same, the rooms for what I have called special instruction may vary considerably. Education authorities seem to lose sight of this fact, and in some cases invite plans in competition, stipulating for extra large laboratories and art rooms, swimming baths, and many other things which do not form part of another school upon which they base their price per head. Thirty-five pounds is a favourite figure to quote, but a quite insufficient one unless the accommodation in laboratories, art rooms, dining-

---

*Extracts from a paper read by Mr. Herbert T. Buckland before the Architectural Association, on February 5th. The first portion of the paper, dealing mainly with elementary schools, was given in our issue of February 10th, p. 113. The second part appeared last week.





BLACKPOOL CENTRAL LIBRARY COMPETITION: ONE OF FIVE DESIGNS BRACKETED FOR SECOND PLACE, COOPER AND SLATER. ARCHITECTS.

rooms, gymnasium, etc., is kept within modest limits.

Of the plans I have shown, the school at Bishop Auckland, by Mr. Reynolds, is estimated to cost £1,500, and for the one at Bromley, by Mr. Burke Downing, the sum of £8,000 was mentioned in the conditions of competition. The accepted estimate for the schools at Barnsley was £18,672. Of the schools at Rotton Park, I am unable to separate the cost of the secondary portion, as this and the elementary school were all in one contract. From 6d. to 7d. per foot cube will, I think, be found reasonable working figures, with further allowance for playgrounds and boundary walls.

At the conclusion of Mr. Buckland's paper, Mr. Osborne Smith proposed a vote of thanks to the author, and said that the paper had really covered an astonishing amount of ground in a short space of time. Many points in the paper were tolerably new to Londoners, who, perhaps, were unaccustomed to the building of schools in one storey only. He recognised the difficulties of the architect confronted by the problem of satisfactorily ventilating a school that had classrooms on each side. A great deal, he believed, rested with the teacher, who almost always preferred the windows closed. In regard to the question of aspect, he was inclined to think a south-east aspect the best, but the matter was more or less one of sentiment.

Mr. Fleming, in seconding the vote of thanks, commented upon the movement in the direction of open-air schools. He believed there were about six in Germany; and London had imitated the example by erecting its first open-air school at Plumstead. This consisted of sheds open on one side only. Last year saw the establishment of three open-air schools, and this year would probably witness further developments. If medical officers intended developing the idea of much fresh air in classrooms, it meant a new type of school altogether, more especially in London, or the great manufacturing cities of the north, where impurities of atmosphere would have to be dealt with. In Germany, every school had its gymnasium, and it seemed to him that there physical education was more scientifically studied than in England. He had seen classes of both German and Swedish scholars, and he had to admit their decided physical superiority over London children. This would involve the alteration of many grave defects in the present design of school. In Munich, Stuttgardt, or Stockholm, schools were to be found well worth careful study in all their details, from the point of view of comfort, as well as of artistic treatment. The amount of money allowed for the erection of English schools did not bear comparison with that allowed for Swedish schools, in which from £20 to £30 per head was permitted.

Mr. Herbert T. Buckland briefly replied.

Contributed by Mr. T. J. Bailey, F.R.I.B.A.

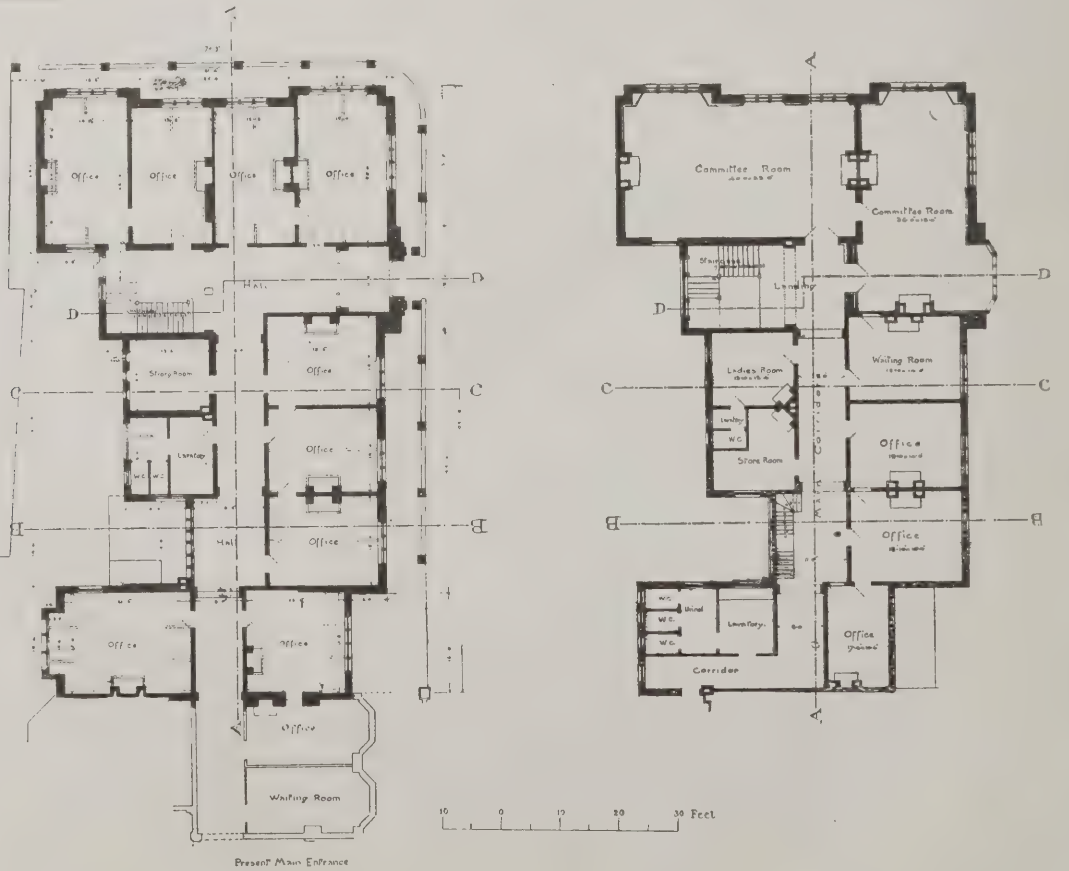
Mr. T. J. Bailey sent the following written notes on the paper, which were read at the meeting:—

Special Requirements.

Mr. Buckland only deals with two kinds of school: the ordinary elementary type and the secondary school. To make the subject complete, I should have expected some reference, at any rate, to be made to the higher elementary type on the one hand, and the schools for mentally and physically defective, of which there are several requirements, on the other. To take his remarks on the elementary school, he naturally begins with the sites; as his remarks evidently only refer to large schools in towns, it is manifest that the Educational Body has very little choice. It is not always possible even to obtain the 30 ft. of unbuilt-upon playground space which is regarded as a minimum by the Code of the Board of Education. In London, at any rate, considerations of rehousing obligations operate largely in the choice of a site. In the paper I read at the R.I.B.A. some years ago, I gave my observations on this subject, and can only repeat that the only ideal site is to be obtained in a not altogether built-upon suburb. No doubt the Board of Education is right in laying down the axiom that a three-storey type should not be followed if space allows for the buildings to be one of two storeys high. The question of the desirability of a central hall has gone beyond the line of argument, and also, I am glad to say, has the question of whether each department should have its central hall, or whether there should be one common to two or three departments. As the hall takes the place of a corridor, giving access to the various rooms, it is obvious that great confusion would ensue if the hall was used by another department than that to which it was attached, and, if built as a separate block, each department would need corridors and connections with the hall, thus rendering the cost prohibitive.

Infants' and Mixed

In a school of the size referred to in the paper, viz., 1,000 to 1,200 children, the point raised as to its being built as a two-department school—infants and mixed—is worth notice. It would not do to provide more than about 380 infants, and this would give a mixed department of 700 or 800, manifestly too large. The mixed department would, therefore, have to be divided into two, senior and junior, probably under one head-teacher—preferably not. In large towns the position of the school with regard to the social position of the families supplying the children would probably determine the question of mixed or separate departments—the lower the grade, the more danger in mixing. With regard to the sizes of the class-rooms, the lecture appears to favour classes of from 50 to 60. In the paper I referred to, I dealt with that subject, and am glad to be able to say that all new schools and alterations to old ones in London under the County Council have a unit of 40 for the class rooms, any variation of that being in favour of a smaller number, 30 or 35, in the graded departments, and not exceeding 50 in the infants; and I would here emphasise my view, expressed at that time, that no seats should be more than 20 ft. from the window wall, and I wish the



Ground Plan.

First Floor Plan.

EXTENSION OF EAST RIDING (YORKS) COUNTY COUNCIL OFFICES, BEVERLEY. B. S. JACOBS, F.R.I.B.A., ARCHITECT.

Code would be altered accordingly; for elementary schools it is equally as important as secondary. Mr. Buckland makes no reference to the desirability of providing any other rooms for teaching purposes than the ordinary class rooms. In my opinion, and with the experience I have gained in building the schools of London and 25 years, I consider it very desirable that there should be a room for general science—not advanced work—and also a room for art teaching in the boys' departments, and rooms for teaching domestic subjects in the girls' departments, and I would have these attached to all schools; also a room apart from the main building in the boys' department for manual training work in wood or metal, or both.

I am afraid the

Remarks on Secondary Schools

do not give much guide to either the requirements or the points of planning, but I would remark concerning them: (1) The number to be accommodated, Mr. Buckland knows of no recent secondary school which accommodates more than 400 in one department. I am building five secondary schools for girls in London, accommodating upwards of 500 in each, and I certainly do not agree with him that a *central* hall is not the best arrangement—with nine class rooms, or more, on a floor, it is surely better that they should discharge into a large hall than into corridors, and it is manifestly the cheapest arrangement for building, and I can answer for it that there is not only no inconvenience, but it is appreciated. There are many requirements in secondary schools which are touched upon, but the variety of subjects taught and the needs in such an eductaional establishment need more than a passing reference. As regards the number of departments in a secondary school, it is best that, in large towns, they should be built as separate schools; of course, in country districts, combined schools may be desirable, having regard to the smaller numbers to be provided for.

Finally, and the only matter the lecturer touches upon in detail—on

The Question of Ventilation

—the remarks are all a criticism of the Plenum system, and, as I understand it, a condemnation of it. This I cannot agree with. In my opinion, a really good modern installation on this type is the best that can be had, but there are so many prejudices against it, that public bodies hesitate to adopt it on this account. I have installed it in five or six cases some years ago with great success. I have also installed it where it has been continually complained of. If I were to instal it in a building now, I would only have it in operation in the winter—but the extra cost on the building for ducts and flues renders the cost prohibitive where there is a desire to keep down the cost of a building to the lowest point. Experts favouring both systems would argue the respective merits for a week, and would probably leave the hearers confused and unconvinced. I can only speak from my own experience. A head-teacher told me the other day in a school where the Plenum system was instal'ed 10 years ago, that in foggy and frosty weather they are practically in the Riviera, and I have never heard any complaints from that school that the windows could not be opened in the summer. As regards the system of warming by low pressure hot-water as compared with steam, it is well to remember that the latter probably means the employment of an engineer for working it in the winter, as it is too dangerous to entrust to the ordinary schoolkeeper, with his multifarious duties about the school, whereas the former can easily be attended to by him.

In his remarks on

Sanitary Accommodation,

Mr. Buckland refers to automatic flushing. This means troughs, which are pretty universally condemned by the faculty in these days. Besides, all towns have their sanitary by-laws, and I doubt if any at the present time would approve these, certainly not in London—it is surprising news to me that even in a single case independent flushing "was not satisfactory, and an automatic system had ultimately to be installed." It would be interesting to hear where this occurred. The reverse is my experience, and is the cause of constant disputes with Borough Councils in the case of old schools which are working satisfactorily.

Areas of Central Halls.

The general remarks touching lighting, desking, etc., are truisms which need no comment, but I would like to place on record my opinion that the requirements of the Code as to the areas of central halls, viz., a minimum of 6 ft. per scholar in secondary schools, and a maximum of 4 ft. in elementary schools, is incomprehensible, especially considering that in a properly equipped secondary school there is a gymnasium and dining room in addition.

INFLUENCE OF MATERIAL ON WOODWORK DESIGN.

Mr. F. D. Troup, F.R.I.B.A., lecturing at the Carpenters' Hall, London Wall, E.C., observed that as an artist speaks with his brush, so, even more, does a craftsman, by means of his hammer or chisel, express his thoughts through his work It is very seldom, he said, that we find a true working craftsman, who has an intimate knowledge of his craft, and at the same time a fluency of expressing himself to others. Proceeding to the consideration of

Timber Houses.

these, he said, are of two kinds—there are the "half-timbered" houses, as they are called, of our own country and of France; (2) those of Norway and other northern countries, which are built entirely of solid logs, and are called "whole-timber" buildings. Some slides that were here shown demonstrated very clearly the contrast between the châlets, or log houses, and the half-timber work of England and France, and included examples from Switzerland, Bayeux in Normandy, and Speke Hall in Cheshire. These two methods of construction, the lecturer said, are absolutely different, and have developed entirely different designs and entirely different methods of ornamentation. By design, he implied the whole construction of the building, and not merely the ornamental treatment. In the case of the Swiss châlets, the method of construction was as follows: The walls are built of straight timbers, sometimes of the length of the house. Each log has the top and bottom sawn off so as to present a flat surface, and these logs are placed one on the top of the other, with a layer of dry moss between each, instead of mortar. At the angles of the building the logs are notched into one another. In some cases the two sides of the logs were sawn off, so as to present a level surface on both sides, and this is usually found in the modern work.

Concerning Roofs.

The lecturer said that here we have a good instance of the way in which the material influences the design. The wooden walls, if they are to last, must be protected from snow and rain, and so we find in the Swiss houses, big projecting eaves, supported by brackets, which not only keep off the wet, but afford good shade in the summer. The roofs are of very low pitch, and on this account the snow remains on them and helps to keep the house warm. They are usually covered with shingles, on which are placed large stones to prevent the wind getting underneath and moving them. There are no valleys, and the roof is kept as simple as possible, usually in one span covering a square building.

English and French Half-timber Work.

In England and France, the timber used is neither so long nor so straight as the Swiss pines, and so a different method of construction is adopted. A wooden sill is laid after the Swiss fashion, and on that a framework is raised, mortised and tenoned with braces formed of the curved branches to enable the carpenter to get his tenons right, both at the sill and at the corner post, which it supports. As a protection against the weather, we often find the upper storey projecting. This is effected by shooting out the floor joist over the wall that carries them. When the projection occurs on both front and side of the building, we find a diagonal beam into which both joists are tenoned. This beam supports the angle post over, and is itself supported by a bracket, formed of the root of a tree inverted, and sometimes elaborately carved. Many beautiful examples of both French and English work were shown, and the lecturer drew special attention to the fact that in France we find very little curved work, the braces are usually straight, while in England they are frequently curved. This difference can very likely be accounted for, he said, on considering that English oak consists of big limbs and curved branches, while in France it is both straighter and heavier. The lecturer next gave a description of a house in Norfolk, to which he had recently made some alterations. A peculiar point to be noted was that the timbers of which the house was constructed did not show at all on the outside.

Woodwork of the East.

The lecturer then proceeded to point out the chief difference between our treatment of woodwork and that of the East, where, generally speaking, large pieces of wood were carefully avoided, the panels of doors, for instance, being divided up into small pieces. Numerous excellent examples were shown on the screen, of work from Cairo and elsewhere and these, he said, could be supplemented by examples from China, India, and Japan.

The Pitfall of the Designer on Paper.'

In conclusion, he said, you ought to be able to tell from the apppearance of a well-designed thing whether it is made of soft wood or hard wood, and the pitfall of the paper-designer is that he does not sufficiently understand his materials. When in doubt, the designer should pay a visit to our museums and study the old examples; but construction must come first. By construction he meant the whole treatment of the material; and the tools used, and the craftsmen who executed it, must be taken into the account. It is wise to take the craftsman into your confidence, and modify your design to suit him—or perhaps, and better still, get him to modify it for you.

Architect as Craftsman.

The lecturer next gave a word of advice to young architects. You have been told, he said, from this platform to get to the bench. This may seem impossible, but you may be sure that if you learn one craft, it will give you an instructive insight into all the others. Do what is constructively right. and true to the material you are working in, the result will be the best you can do, and no one can expect more of you.

With respect to the designing of buildings by official architects, "An Architect and Ratepayer" writes to the Manchester "Daily Dispatch":—"Is it to the advantage of the ratepayers that all their building works should be designed by the Corporation officials in the Town Hall? It certainly does not give our local architects a chance of showing publicly their skill in the designing of buildings. When our city architect was appointed, it was understood that his duties would be to advise the Council upon all plans deposited, especially with regard to the elevations fronting improved streets, and so give the city some pretensions to architecture. Then why should local architects who are ratepayers be deprived of submitting designs in competition? There is no reason why architects should not be asked to compete just in the same way that builders have the option of tendering for public work. My opinion is that not only would buildings be erected cheaper and better, but architects and their assistants would be found employment in these days of bad trade." With much of this contention we quite agree.

Proposed New Works.

BARNES.—The U.D. Council has approved plans for the following:—Conversion of houses into shops and the erection of bakehouse, Nos. 46, 48, 50, 52, 54, 56, Lower Richmond Road; ten houses, Blind Lane, Messrs. Tyars and Jago; three houses, Beverley Path and Brookland Avenue, Messrs. Tremain and Tolkein.

BEXHILL.—The Town Council have approved plans for the following:—House in Collington Avenue, Messrs. Moon and Garner, owners, Mr. J. B. Wall, architect; house in Collington Avenue, Messrs. Moon and Garner, owners, Mr. C. W. Spencer, architect.

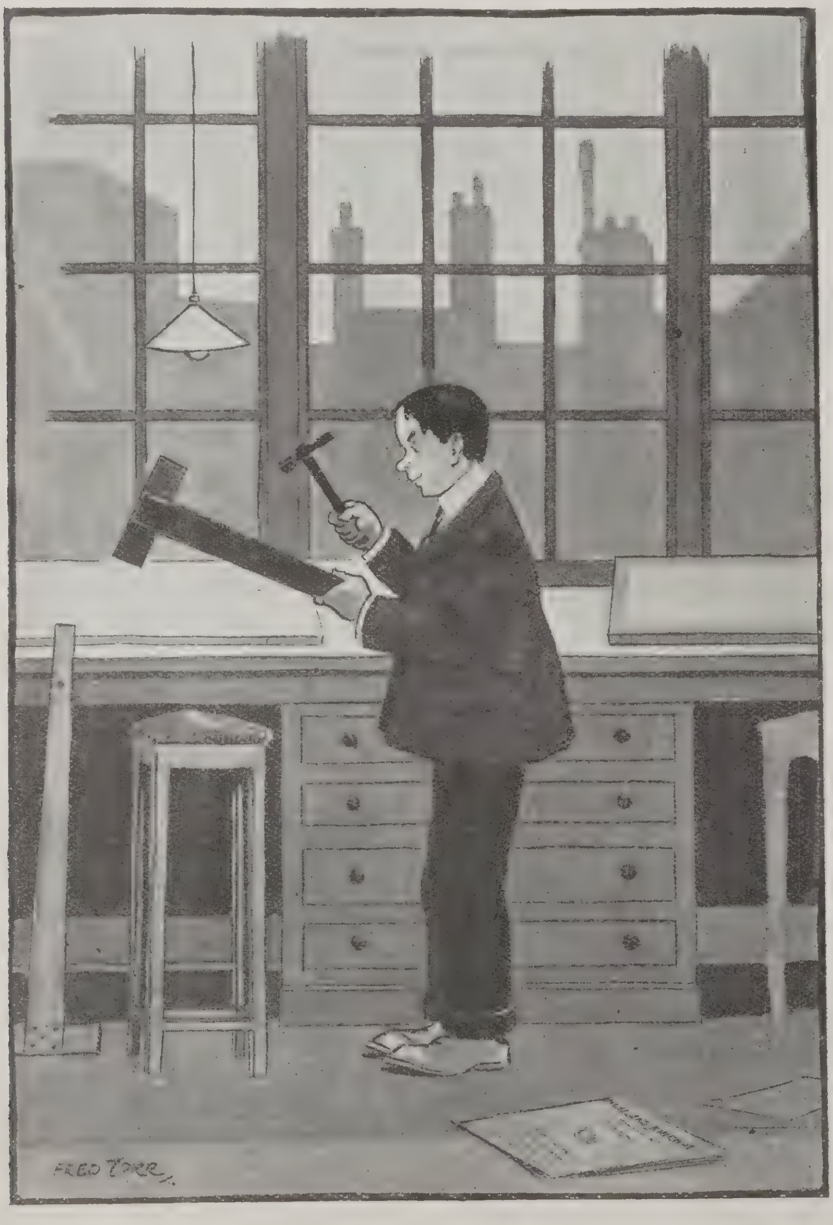
CHATHAM.—The Town Council has approved plans for the following:—Bungalow at Walderslade, for Mr. A. E. Templeman; two houses, for Messrs. A. H. Hastings and C Day; 26 houses, at Beaconsfield Road, for Mr H. P. Hughes; new premises in Luton Road, for Mr. C. E. Skinner.

ENFIELD—The L.G. Board have sanctioned the borrowing of £9,750 for enlarging the Southbury Road Council Schools.

GLASGOW.—The Dean of Guild Court has granted permits for the following:—The Overnewton Building Company, to erect six tenements of dwelling-houses in Nairn Street and Esmond Street; John Philip, builder, 87, Union Street, to erect 15 terraced houses in Crown Road, Jordan Hill; the Mount Florida Bowling Club (Limited), to erect a bowling green club-house in Carmunnock Road; Appleby's (Limited), Crane Works, Rigby Street, Parkhead, to erect an extension to their works there.

GOSPORT.—A new Soldiers' Home is to be erected on a piece of Government land, adjacent to the railway station. The new building is to be similar to the Sailors' Home, Queen Street, Portsea, with a large number of cubicles, and billiard, recreation, and reading rooms.

HORNSEY.—The Town Council has approved plans for the following:—Two dwelling-houses in Causton Road, Highgate, Messrs. Fedrick Bros., of Cholmeley Park, Highgate; four dwelling houses in Creighton Avenue, Muswell Hill, Mr. C. Tucker, of Page's Lane, Muswell Hill; dwelling-house in Cholmeley Park, Highgate, Mr. W. Houghton, No. 24, Weston Chambers, Southend-on-Sea; 13 dwelling-houses in Cholmeley Park, Highgate, Messrs. Fedrick Bros., of Cholmeley Park, Highgate, N.



"Then George Street, Norman Shaw, and Eden Nesfield showed how much of the real qualities of a building could be expressed by line. One incident of the time was the discovery that one of these masters used a notched straight-edge, thereby admirably rendering the texture of roofs I confess to having sacrificed a T-square myself in that cause."—*Mr. Ernest George's address to the Students.*

THE NEWEST JUNIOR IN ONE PROVINCIAL OFFICE FOLLOWS IN ILLUSTRIOUS FOOTSTEPS.

NORTH SHIELDS.—The Trades Commerce Committee of the Tynemouth Town Council are considering two schemes for the extension of the Fish Quay. One scheme, providing over 1,000ft. of additional quay frontage, is estimated to cost £24,000, the other with 691ft. of quay frontage would work out at about £13,000.

SELKIRK.—The School Board are considering various schemes for reorganising their school accommodation, made by Mr. John Hall, architect of Galashiels. The rebuilding of one or enlarging of other schools will probably be required.

WHITEHAVEN.—The Town Council have approved plans for the erection of a new elementary school in Irish Street at an estimated cost of between £9,000 and £10,000.

Works in Progress and Completed.

BLACKBURN.—The extension of the Blackburn and East Lancashire Infirmary, at a cost of more than £5,300, has now been completed. Messrs. Simpson and Duckworth, of Blackburn, were the architects, and Messrs. W. J. W. Cronshaw and Sons, Blackburn, the contractors

BRISTOL.—The new church of St. Ambrose is in course of erection, at a total cost, when completed, of about £12,000, but at present the tower will not be proceeded with. The building, which is to seat 700, will be of local stone, with Bath stone dressings and roofs covered with Broseley tiles. Messrs. W. V. and A. R. Gough, Bristol, are the architects.

CLYDEBANK: RADNOR PARK.—Messrs. Robert M'Alpine and Sons are about to erect 36 houses of two-storeys each. Eighteen are to be of two rooms and kitchen, and eighteen of one room and kitchen; all with baths and garden plots in fronts.

HAMILTON.—The public baths and wash-houses have now been completed at a cost of £11,000. The new buildings comprise offices, waiting-room, swimming pond, slipper and spray baths, club-house and wash-house of eight stalls. The swimming pond is 75ft. long by 35ft. wide, and the pond hall has galleries providing accommodation for nearly 700 spectators. Mr. W. H. Purdie, the Borough Engineer, was the architect.

LEEDS. — The new church of St. Margaret's, Cardigan Road, erected from the designs of Mr. Temple Moore, London, has now been opened. Messrs. H. Atkinson and Sons, Leeds, were the contractors.

OXFORD: SUMMERTOWN.—The new church of St. Michael and All Angels is now in course of erection. The church, when completed, will accommodate about 1,000 people, at a cost of about £13,000; but at present only a portion of the building, to hold 600, is in hand; this first portion costing £7,866. Messrs. Wooldridge and Simpson are the builders, and Mr. A. Mardon Mowbray, the architect.

ST. ALBANS.—The tender of Messrs. John Bentley and Sons of Waltham Abbey, at £7,324, has been accepted for the erection of the new church of St. Paul. Messrs. J. E. K. and J. P. Cutts are the architects.

SETTLE.—A new infectious diseases hospital has been erected by the Rural District Council at a cost of about £6,500.

TOTNES.—The new workhouse infirmary has been completed. The total cost will be £8,500. Messrs. Petherich, of Plymouth, were the contractors, and Mr. W. F. Tollit, of Totnes, the architect.

WHITEFIELD.—A new secondary school, to be known as the Stand Grammar School, is to be erected by the Lancashire County Council, at a cost of £17,357. Mr. H. Littler is the architect.

WINCHESTER.—The new County Council offices, designed by Mr. J. Taylor, county surveyor, and approved by Mr. T. G. Jackson, R.A., are to be proceeded with at once. The total cost, including furnishing, is estimated at £20,000.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Mar. 1.	TORRINGTON (DEVON). Memorial Cross. The Committee of the Rolle Memorial invite designs for a memorial cross (preferably of granite), to be erected in the churchyard, Torrington. Cost, inclusive of erection, &c., not to exceed £100. Premium £2 2s. for the selected design, but no other charge or expense. Particulars from George M. Doe, Town Clerk, to whom designs are to be sent.
Mar. 8.	*PONTARDAWE (WALES). Offices for the Guardians, in Holly Street. Premium £10 10s. The premium is offered by the Guardians "for plans with abridged specification, *which in their judgment* are best suited." Particulars and conditions from C. B. Jenkins, Clerk, Herbert Chambers, Pontardawe, S.O., Glamorganshire.
Mar. 17	†NEW OFFICES FOR THE STANLEY U.D.C., DURHAM. Cost £3,500. Premiums £30, £20 and £10. Conditions, etc., to be obtained from J. G. Ridley, Clerk to the Council, Stanley S.O., Co. Durham.
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days
April 10.	BOLTON BRANCH PUBLIC LIBRARIES. The Libraries Committee of the Corporation invite competitive plans from architects who have been principals in the County Borough of Bolton six months prior to the present date for Branch Public Libraries to be erected in the districts of Astley Bridge, Halliwell, and Gt. Lever. The plans and particulars may be obtained from Samuel Parker, Town Clerk, Town Hall, Bolton. Deposit, two guineas.
April 12.	ELLAND NEW SECONDARY SCHOOL. Architects having offices and practising in the West Riding of Yorkshire are invited to compete for the work in connection with the new Secondary School at Elland, and should apply for particulars to Mr. Leonard Clegg, Holiwell Green, near Halifax.
July 31.	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	BOURNEMOUTH BRANCH PUBLIC LIBRARY. Architects practising in the County Borough of Bournemouth are invited to submit designs for a new Branch Library at Boscombe. Particulars from Charles Riddle, Borough Librarian, Central Library, Bournemouth.

*We are advised by Mr. Jenkins that the supply of particulars and sketch plans is exhausted and no further applications can be entertained.

† The Royal Institute advises members not to compete.

Girls' Secondary School, Romford.

The premiated designs for the above were on view from 10 till 6 on Saturday, February 20, at Albert Road School, Romford.

Laying Out Estate at Oswaldtwistle, Blackburn.

Mr. Alfred Smith, hon. secretary of the Lancashire Federation of Small Holdings Associations, informs us that the competition for the above was closed a fortnight ago. Unfortunately, the competitors had made so little use of the existing roads, and had consequently proposed so many new roads, that none of their schemes were practicable. The Small Holdings Committee of Blackburn have therefore adopted a plan prepared chiefly by a member of the committee and the borough engineer. They awarded the three prizes of £25, £10, and £5 to the three competitive schemes which seemed the least impracticable.

New Grammar School, Barnsley.

In the competition for the above school (for the governors of the Barnsley and District Holgate Grammar School), Mr. A. W. S. Cross, M.A., F.R.I.B.A., has been appointed assessor in conjunction with Mr. A. Houghton, the county council's chief inspector for higher education.

THE CONCRETE INSTITUTE.

The Commercial Aspects of Reinforced Concrete.

By Lucien Serraillier.

The lecturer began by stating that the relation which subsisted between (*a*) the client or principal, (*b*) his technical adviser, and (*c*) the contractor in ordinary civil engineering and architectural construction was more complex in reinforced concrete construction, whilst the recent advent in England of firms which were endeavouring to popularise this particular industry had further intensified the complexity of this relation. The present paper was an attempt to define the duties and responsibilities towards each other of the various parties engaged in this class of construction, to explain the conditions which govern its exploitation, and to determine between (*a*) the principal or engineer and architect, (*b*) the specialist firm which confines itself to this branch of construction, and (*c*) the contractor, an equitable relation which should, as far as possible, conciliate all interests and eliminate those injustices which now unfortunately arose, undoubtedly through ignorance of those peculiar conditions rather than through intention.

The principal, or his technical agent the engineer or architect, hereafter called the client, had two methods at his disposal under which reinforced concrete work could be undertaken: (1) He might design the structure himself, and either confide the work to a contractor under his supervision or else carry it out himself with his own gang of men; (2) he might entrust the design to a specialist firm, and either carry it out himself with his own men, or with his own contractors, or else get the specialist firms to do it themselves or through contractors selected by them.

The first method was the usual practice adopted in general civil engineering and architectural construction, whereas the second method might be said to be peculiar to reinforced concrete, although sometimes adopted for steelwork. The technical and practical difficulties of the reinforced concrete industry were of such a special nature that the client generally preferred to employ a specialist firm, to whom he thus delegated his duties and responsibilities, contenting himself with a secondary control.

Division of the Work.

Reinforced concrete work might be subdivided into—1, the design; 2, the execution; 3, the reinforcing material employed (as also other materials of construction which do not concern us in this paper). In ordinary construction, matters were simple enough, because the engineer or architect who was the designer of the work assumed control of its execution, and was responsible for such, although any mistake on his part affected his reputation, but never his pocket. In that case the designer not only controlled the contractor, but indirectly, through the latter, also controlled the merchants who supplied the material; he had the right of rejection, and in virtue of the fact that he held the purse-strings his power was supreme. In reinforced concrete, matters were not so simple, for where the designer was a specialist firm, it was the engineer or architect who then became the principal or client, and the specialist firm assumed his duties and responsibilities, and certain additional responsibilities into the bargain.

The Intrusion of the Specialist Firm.

The point which concerned them in the paper was the case where the assistance of a specialist firm was called in either by the client direct or through his technical adviser. There were two categories of specialist firms—(A) those which derived their profits from the exploitation of a patent system of construction, and (B) those which derived their profits from the exploitation of a patent form of reinforcing material. The firm which exploited a patent system of construction combined divisions 1 and 2, previously referred to—i.e., the supply of the design and its execution. The execution was generally carried out by contractors specially licensed by the specialist firm, whose work was approved by the latter. On the other hand, the firm which exploited a patent form of reinforcing material combined divisions 1 and 3—i.e., the supply of the design and of the necessary reinforcing material. In this case the execution was generally tendered upon by non-licensed contractors, with sometimes, however, a certain restriction in their selection. Where a specialist firm executed the work itself, it came within the category of a licensed contractor for that special contract.

The logical method would doubtless be for specialist firms to combine all three divisions, and supply design, execution, and materials, thus doing the whole work throughout themselves. But it was obviously impossible, under present conditions, for any single firm to keep up the enormous organisation which would be necessary to carry out contracts simultaneously in all parts of the country.

Each method of exploitation had its use and advantages, and the selection of method by the client would depend on circumstances and on local conditions. There was room in this country for all methods and systems, and no doubt in time these would settle down into specific grooves, so that certain classes of work would be carried out on certain lines, and some co-relation would be established between the various firms and systems which would apportion the work to the interests of all concerned.

Responsibilities.

It would be conceded as a general principle that responsibility should be confined to duties undertaken. It was illogical, for instance, to fasten responsibility of execution upon a specialist firm which was not afforded the opportunity of control and supervision of work. It was unfair to expect this firm to make good any mistakes in quantity of material which might arise in estimates; and yet this was continually occurring. The client, when ignorant of the method of construction he was about to adopt, naturally looked to the specialist firm for a guarantee. A refusal to accept this guarantee would frequently lose the work, because the client imagined that the firm had no confidence in its system. The real reason for refusal was that no provision was made for supervision, and, as so much depended upon the actual work upon the site, no specialist firm which valued its reputation would accept such responsibilities, unless it was in a position to supervise. Clearly responsibility in this case should be accepted by the contractor, but he would frequently refuse, under the impression that everything depended upon the system adopted; naturally, if he could avoid such liability he will do so. The ordinary responsibilities of a specialist firm should be limited to the design and to the quality of the reinforcing material, when the latter was supplied. When a full guarantee involving construction was exacted, the firm should stipulate for proper supervision and control over the contractor by one of its staff appointed as resident engineer, with suitable remuneration for such service. The ques-

---

[*] Abstract of paper read by Lucien Serraillier, at the third general meeting of the Concrete Institute, February 18th, 1909.

tion of responsibility, therefore, should be clearly defined at the outset of every contract, and those specialist firms which did not carry out contracts themselves should stand together in resisting the imposition of guarantee for work which they could not control, or otherwise any resulting disaster would affect the reputation of all.

In the case of firms which exploited (A) systems of construction, the responsibilities were, of course, more clearly indicated. The firm guaranteed its design and the licensed contractor guaranteed its execution. The reinforcing material being purchased by the contractor, the latter was responsible for it, but had the right of rejection. In this case the specialist firm occupied the place of the technical adviser, and risked its reputation like the latter, but not its pocket, except as regarded the guarantee of design pure and simple.

(To be concluded.)

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible.

The services of a large staff of experts are at the disposal of readers who require information on architectural, constructional, or legal matters.

The querist's name and address must always be given, not necessarily for publication.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s., made payable to Technical Journals Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

Such answers will be forwarded to the querists promptly on receipt from the respective experts, but the Editor will not be responsible for any delay that may arise. The fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies. Every effort is made to ensure correctness, but Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

The Editor expressly declines to be held responsible for any mistakes or inaccuracies that may occur, nor does he undertake to satisfy in every instance the querist's demand. The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Selling Presumed Quarrying Field.

YORKSHIRE.—PERPLEXED writes: "It is desired to offer for sale a field next to a famous quarry. It is presumed that the stone exists also beneath this field. What would be the basis of calculating a fair purchase price? Please advise generally."

The simplest plan for disposing of the field appears to be to place it in the hands of a local auctioneer, who is in the habit of dealing with landed estate in the neighbourhood; he will be able to estimate the value very nearly indeed, and will advise as to whether it should be offered for sale by auction or privately. He may also be able to say whether any advantage is likely to be derived from the expenditure of capital in opening up a face of rock ready for working (this is sometimes a very expensive business, depending greatly upon the amount of the "overburden" of earth to be moved, and the levels by which access may be obtained to the stone). Theoretically, the value of the land depends upon the thickness and depth of the stone, its value when quarried, cost of quarrying, marketing, etc., but practically it becomes a pure matter of bargain, and is often greatly influenced by purely local circumstances, and the area of other land which is also in the market. The usual terms of a lease are, briefly: (1) the payment of a surface (or "dead") rent of approximately double the agricultural value of the land; (2) the payment of a royalty on every ton of stone extracted from the quarry, this price being fixed in accordance with the quality of the stone and the cost of working it. I have known royalties ranging from sixpence to two shillings per cubic yard, one shilling being a not unusual figure. (3) A minimum rent is usually agreed upon, merging into the royalty, and sometimes the lessee is allowed in a subsequent year to recoup himself for any deficiency in a previous year, without further payment of royalty. (4) The term for which land is thus let is rarely for less than 21 years, and more generally the lease is for 60 years. As the tenure of the land in question is such that the granting of a lease may cripple the output, it certainly appears to be desirable that the foremost owner should either sell his interest outright, or work it either himself or by a syndicate in which he has a controlling interest. F.S.I.

Shingle and Seasand for Concrete.

LONDON, N.W.—A. J. H. writes: "Concrete composed of shingle and sea sand is largely used in certain localities. Would you consider the objections to it insuperable?"

The only objection to concrete made with sea sand, or even sea water, is that the salt effloresces on the surface for a time, but that passes of. The strength is slightly less for the first few months, if salt is used, but after, say, six months there is no difference in strength. Sea sand and shingle have the merit of being clean and sharp, and are excellent materials for concrete. They should, however, be screened and carefull graded so as to get a concrete of maximum density.

Rights of Lessee.

CORNWALL.—LESSEE writes: "A gentleman has acquired by purchase a leasehold estate of several acres. The term is of sufficient length to induce building, but the lease itself does not specify the land as building land, merely treating it as ordinary land, and reserves to the lessor all trees, saplings, and minerals. The present lessee now wishes to develop the land as a building estate by constructing a new road, and also with a frontage on to a private road over which he has a right-of-way. I shall be glad to know if the lessee can, without the consent of the freeholder:—(1) Construct the new road, carry away the necessary vegetable soil, and hand the road over to the urban district council. (2) Connect to a drain which has been laid in the private road. (3) Use for the new buildings the sand excavated from the site. (4) Remove the wood to make room for building sites. And can the district council (a) set back the frontage line beyond the existing line; (b) prevent building on the private road because there is not a 24ft. entrance; (c) demand that the front boundary line on the private road shall be 18ft. from the centre of the road? The local by-laws stipulate that new streets (more than 100ft. in length, which this is) shall be 36ft. wide. The council have also adopted the Public Health Act, 1907."

Questions of this sort are exceedingly difficult to answer satisfactorily without seeing the lease itself. The best course is to take them to a good solicitor and pay him for a proper opinion. At first sight, however, it seems to be tolerably clear that the lessee has no right whatever to deal with the land in the way suggested. This sort of thing could only be done properly by a freeholder. The lessee cannot construct the new road, use the sand excavated from the site, nor remove the wood to make room for building sites. With regard to question 2, however, he is at perfect liberty to connect any necessary drains to the sewer in the private road, provided that he arranges the matter with the local authority, and the owners of the recreation ground. So far as the district council is concerned (a) they would not be at liberty in the ordinary course to insist on the frontage line being set back any further; but (b) they could certainly prevent building on the private road on the ground mentioned; and also (c) they could demand that the front boundary of this road should be 18ft. from its centre. As said above, all these answers are subject to correction by a solicitor who could have all the facts placed in his hands, together with a copy of the local by-laws. INSTITUTE.

THE GUILD OF ARCHITECTS' ASSISTANTS.

The inaugural meeting of the proposed Guild of Architects' Assistants will be held at the Tudor Hotel (room 19), to-morrow, Thursday, February 25, when Mr. A. W. S. Cross, M.A., F.R.I.B.A., will take the chair at 8 p.m. Sympathisers with the movement, which has been previously outlined in our columns, are invited to be present.

Trade and Craft.

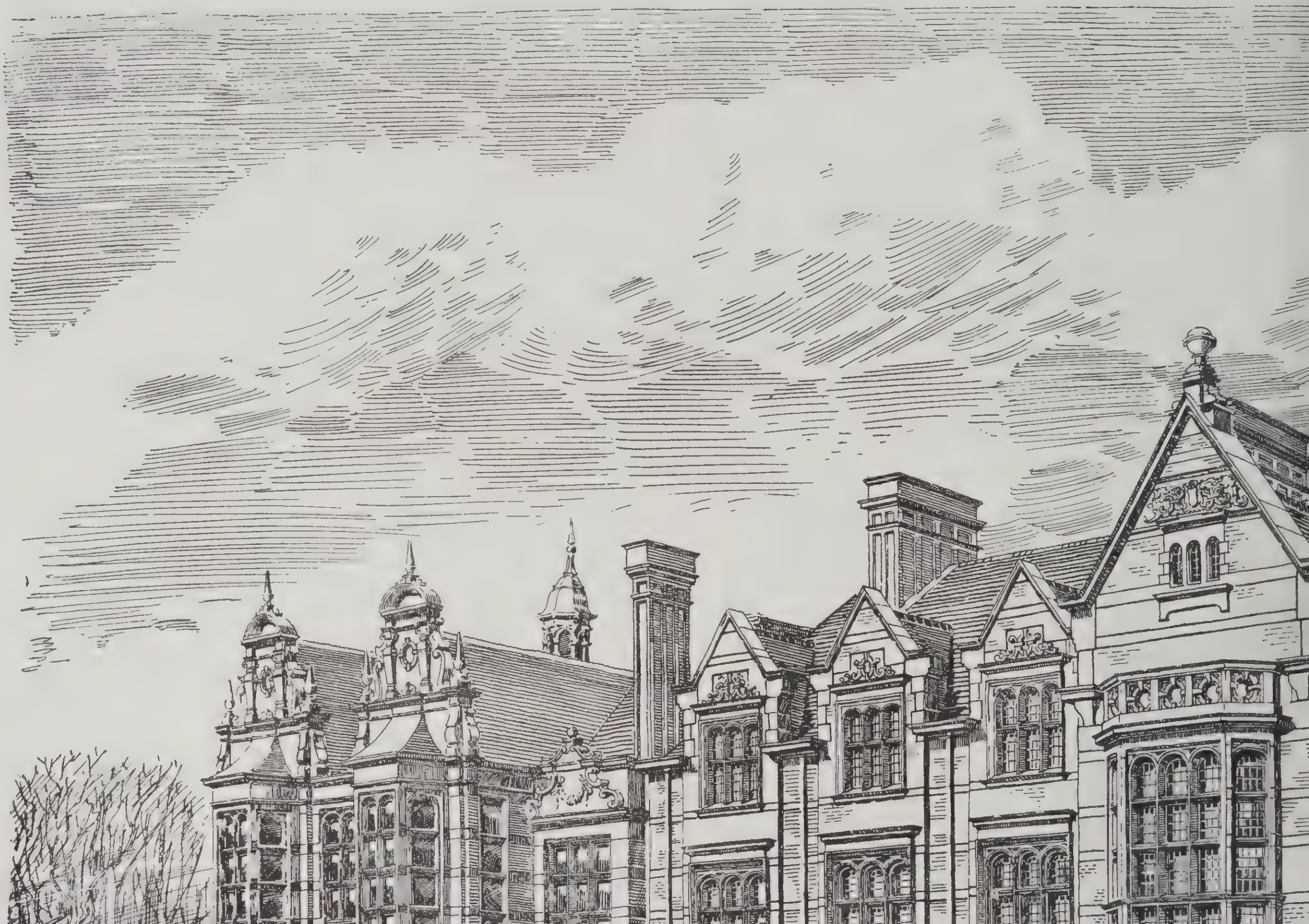
Fawcett's Mon'lithcrete Floor.

The "Mon'lithcrete" floor test of Saturday, February 13th, resulted in the floor developing extraordinary strength. As recorded in our last issue, the span was 16ft. and the rolled steel girders were two 6in. by 3in. by 3in. by 12lb. reduced to 7-3lb. per foot by cutting large rhomboidal shaped openings in the webs, leaving tension metal only between pitched at an angle of 45 degs. to the right and left of the centre, and leaving the webs solid at the ends to resist shear, and the top flanges had been reduced to 2in. These were placed at 1ft. 6in. centres, and buried in a slab of concrete 16ft. by 2ft. 6in. by 7½in. thick, this concrete being 1½in. below the bottom flanges, and flush with the top flanges. The concrete was composed of clean broken brick and tile and Portland cement gauged 6 and 1, and allowed five weeks for setting. The two reduced (7.3lbs. per foot) rolled steel girders were bound together by the concrete passing through the large rhomboidal shaped openings in the webs, and by twisted ¾in. by 1-16in. hoop steels, one in each opening buried about two-thirds down in the thickness of the concrete, but not bent over or connected to the girders in any way. As previously reported, the floor was loaded on Saturday, February 6th, with ballast to the breaking weight (16.8 tons) of two 6in. by 3in. by 3in. by 12lb. rolled steel girders without breaking, the deflection was barely 1in. It was allowed to stand until Saturday, February 13th, when the load was continued to 25.2 tons, or 50 per cent. over the breaking weight of two 6in. by 3in. by 3in. by 12lb. rolled steel girders, and it still stood; the box containing the ballast was by that time 13ft. 9in. high, and heaped up to its full capacity. The distributed load was 14 cwt. per foot super., and the maximum deflection was 2¼in. On Tuesday, February 16th, holes were cut in the sides of the box allowing the ballast to run out, and as this proceeded the floor lifted again, and the deflection on clearing all off was found to be 1⅜in. The value of wall holds for the rolled steel girders, return ends, and longer time for the concrete setting are not here taken into account.

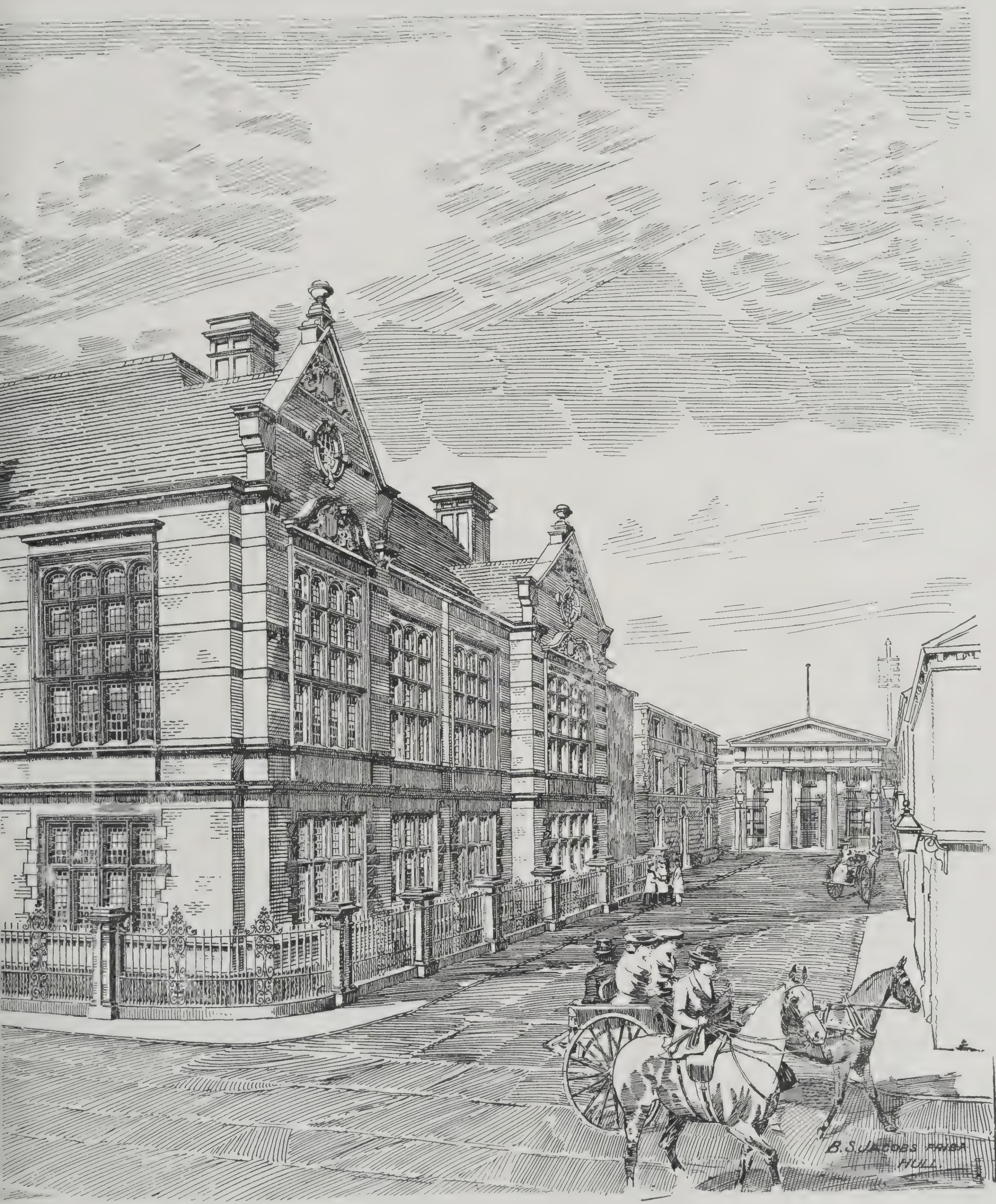
Law Case.

Disputed Ownership of Slates: Difference Between English and Scottish Law.

At the High Court of Justice on Feb. 16th, Master Archibald heard the case of Hall and Company (Croydon), Ltd., v. E. F. Horn, in which the plaintiffs claimed the sum of £23 7s. 6d., being the price of certain slates alleged to have been sold to the defendant. —It appeared that originally the plaintiffs had agreed with certain builders to do the slating of a pair of houses in Manor Park, Lee, at a price of £14 per house, including all incidentals. The plaintiffs delivered a quantity of slates on the site, with a view to themselves doing the slating, but, before they were fixed, the defendant, who had been financing the said builders, took possession of the premises. On the plaintiffs attempting to remove the slates, the defendant objected, but signed a letter addressed to the plaintiffs, agreeing to pay for the slates if they did not belong to the said builders.—Mr. McCardie (instructed by Messrs. Braby and Macdonald, solicitors, who appeared for the plaintiffs, contended that the property in the slates had never



ADDITIONS TO THE EAST RIDING (YORKS.) COUNTY CO



OFFICES, BEVERLEY. B. S. JACOBS. F.R.I.B.A., ARCHITECT.

UNIVERSITY OF ILLINOIS

passed away from the plaintiffs, as they had only agreed with the before-mentioned firm of builders to do the slating, and not to deliver any slates to them.—Mr. Benson (instructed by Messrs. Clifford and Co., solicitors) contended, however, that the slates were the property of the builders, for the following reasons:—The builders in question had a contract with the plaintiffs for doing the slating, and the benefit of this contract had now passed by virtue of the financing agreement to the defendant Horn by virtue of his having taken possession. As the plaintiffs had failed to do the slating for the builders, the assignee of the said builders was entitled to take the slates on the site, and carry out the work which, it was alleged, the plaintiffs had failed to do. A Scottish decision was quoted in support of this contention. Master Archibald decided that, under English law, the plaintiffs must succeed, as the slates had remained continuously vested in them. He added that it was possible that if the case had been tried under Scottish law, the decision might have been different. Judgment was therefore given for the plaintiffs for the amount claimed, and costs.

Our Plate.

East Riding County Council Offices.

The extension to these offices was carried out at a cost of a little over £7,500. The elevations are faced with best pressed thin red bricks, with cornices, architraves, columns, window dressings, etc., of stone from the Warwick quarries. The floors of halls and corridors are paved in Roman cube mosaic laid by Messrs. Diespeker and Co., of London, and the vestibule paved in black and white Roman marble. All floors are of fireproof construction. The large committee rooms are panelled throughout in mahogany to a height of 9ft. The contractors were Messrs. G. Longden and Sons, of Sheffield. The heating apparatus was fixed by the Leeds Marble Works, Leeds. The architect is Mr. B. S. Jacobs, F.R.I.B.A. of Hull.

LOCAL GOVERNMENT BOARD ENQUIRIES.

The Local Government Board has recently held inquiries into proposed expenditure by public bodies as follows:—Water supply works and plant:—Swansea R.D.C., £1,317 for Crockett (February 16th); Leyland U.D.C., £3,564 (February 17th); Bredbury and Romilly U.D.C., £2,814 (February 19th); Rhondda U.D.C., £2,000 (February 18th). Sewerage, drainage, and sewage disposal works and plant:—Evesham B.C., £700 (February 17th); Barnsley B.C., £200 (February 19th); Burslem B.C., £3,800 (February 17th); Croydon B.C., £21,850 (February 16th); Winchcomb R.D.C., £1,000 for Cleeve Hill (February 16th); Epping R.D.C., £4,830 for Roydon (February 16th); Plymouth B.C., £900 (February 12th); Brentwood U.D.C., £13,766, for Upminster and South Weald (February 17th). Street improvements, widenings, new roads, public walks, and pleasure grounds:—Stoke-upon-Trent B.C., £1,850 (February 16th); Hanley B.C., £1,100 (February 18th); Swansea B.C., £525 (February 17th); Monmouth C.C. and Cardiff City Council, £4,263 and £4,101 (February 19th). Various:—Saffron Walden B.C., £1,150 for public baths (February 19th); Padiham U.D.C., £1,500 for stables, etc. (February 18th); Edmonton U.D.C., £900 for public baths (February 17th); Stoke Newington B.C., £1,150 for public slipper baths (February 16th); Wolverhampton B.C., £10,200 for public baths (February 19th); Blackpool B.C., £3,050 for sea-water supply (February 16th); Leeds C.C., £1,320 for cement store (February 18th); Wigan B.C., £1,300 for motor fire engine and £1,150 for corporation baths (February 18th); Bradford C.C., £10,065 for Memorial Hall deficit (February 16th); Nelson B.C., £2,750 for gasworks, new mains, etc. (February 17th); Ilkley U.D.C. £5,700 for gasworks (Feb. 17).

Federation News.

BURTON-ON-TRENT ASSOCIATION.

Secretary: A. W. Chamberlain.

The annual general meeting of the Burton-on-Trent and District Building Trade Employers' Association was held at the Station Hotel, Burton-on-Trent, on Saturday, January 30th, Alderman Thomas E. Lowe, J.P., in the chair.

The Secretary read the annual report, in which the following matters of general interest were included:—

Six new members were admitted during the year, making the membership 36.

The Burton Branch of the Operative Stonemasons' Society have served a notice of new rules to come into operation in May next. Negotiations have been announced with the operatives with a view to the notice being withdrawn, as the committee think that, owing to the depression in trade, the present time is inopportune for making alterations to existing rules.

The collective scheme of insurance against workmen's liability has been well taken up by members during the year, and the balance-sheet of the Law Car and General Insurance Corporation (with whom the risk is placed) is highly satisfactory. There have been considerable claims on this account during the year, which have been met very satisfactorily by the corporation.

It was proposed by Alderman Lowe, and seconded by Mr. A. Maddocks, and resolved, that the secretary's report and financial statement be adopted and entered on the minutes.

The election of officers for the year 1909 was next proceeded with, and the following were unanimously elected:—President, Alderman T. E. Lowe, J.P.; vice-president, Mr. Henry Edwards; treasurer, Mr. Councillor Kennard; hon. auditors, Mr. T. W. Selby and Mr. Fred Hodges.

On the proposition of Mr. A. W. Chamberlain, seconded by Mr. Wood, a hearty vote of thanks was unanimously accorded the retiring officers for their services during the past year. It was proposed by Mr. H. Edwards, seconded by Mr. F. W. Platts, and resolved, that the following members constitute the Executive Council:—Bricklayers, Mr. W. Wood, Mr. A. B. Edwards; stonemasons, Mr. Hodges, Mr. Kershaw; joiners, Mr. A. Knight, Mr. H. Needham; plasterers, Mr. Biddulph, Mr. C. Mitten; painters, Mr. F. Lewis, Mr. F. Holmes. The following were unanimously appointed the Local Conciliation Board, to take office in May next:—Messrs. Geo. Kennard and C. Tomlinson, bricklayers; Messrs. Alderman Lowe and Geo. Hodges, stonemasons; Messrs. F. W. Selby and A. Knight, joiners. Mr. Geo. Hodges was unanimously appointed delegate from this association on the Midland Centre Executive Council.

It was resolved to hold the quarterly meetings as near to the following dates as possible:—February 16th, May 7th, September 10th, and November 5th.

After a vote of thanks had been accorded the chairman, the members proceeded to the annual dinner, which was attended by nearly fifty members and friends, Alderman T. E. Lowe, J.P., presiding. After the customary loyal toast, Mr. Teally, president of the Burton-on-Trent Master Painters' Association, proposed "The Burton-on-Trent and District Building Trade Employers' Association." He referred to the very kind way in which the Builders' Association had recently given their good offices to the local Painters' Association in adjusting their rules with the Operative Painters' Society. He coupled the name of Alderman T. E. Lowe with the toast. Alderman Lowe, in responding to the toast, pointed out the mutual benefits and advantages of association, and paid a warm tribute to the Conciliation Boards. Notwithstanding continuous depression in building, the Burton employers had not asked the operatives to accept a reduction in wages, and he felt confident, from the knowledge he had of the working of the local Conciliation Board, that the men would meet the employers in a fair spirit, and would not forget this considerate treatment of them during five years of bad trade. In the absence through illness of Mr. Geo. Hodges, the toast of "The National Federation" was proposed by Mr. A. W. Chamberlain, who spoke of the many benefits the local association gained by being affiliated to the National Federation. The National form of contract had been a great boon to the associated masters, and to the trade at large. Too much praise could not be given to the Employers' Parliamentary Council for the work they did for the employers of labour in watching all Bills which came before Parliament. He coupled with this toast the name of Mr. F. W. Amphlet, the secretary of the Midland Centre. Mr. Amphlet, who, on rising to respond, met with a very hearty reception, referred to the excellent work of the Parliamentary Council, and of the Conciliation Boards. From his own experience of the Midland Centre Board, he was confident that the Boards would be a great blessing to the trade, as they were the means of righting wrongs without resort to strikes. The toast of the visitors was proposed by Mr. Councillor Kennard, and responded to by Mr. H. Trafford Wynne (of Staton and Co., Tutbury). Mr. Albert Knight proposed the chairman's health, and Alderman Lowe having responded, the singing of "Auld Lang Syne" and the National Anthem brought a very happy gathering to a close.

CARDIFF ASSSOCIATION.

At the annual meeting of the Cardiff Association, held at the registered offices on Tuesday, February 2nd, the president, Mr. J. E. Turner, in the chair, the report of the committee for the year ending December 31st, was presented, viz.:—

The meetings of the National Federation held in London in January, 1908, and in Birmingham in July last, were duly attended by delegates of this association, and the association has also been represented at the quarterly meetings of the South Wales Federation.

A meeting of the Conciliation Board was held at Cardiff on May 25th last. Only one complaint against a member of the association has been made throughout the year, and this was withdrawn before the holding of the meeting at which it would have been considered.

Federation Journal.—Arrangements have been made with the proprietors of the "Builders' Journal" whereby that journal has become adopted as the official organ of the National Federation, and copies can now be obtained through the secretary at a special subscription. Only nine members have as yet availed themselves of this privilege, and it is hoped that during the current year every member will become a subscriber.

Prevention of Accidents in the Building Trade.—The Departmental report has been fully considered, and a letter has been forwarded to the Home Secretary in support of the suggestions made by Mr. George Macfarlane, which it was considered would result in making many of the proposed regulations more practicable.

Apprenticeship Deed.—At the request of the South Wales Federation we have prepared and submitted a form of apprenticeship deed, which has been adopted, and is now being printed for general use.

The association has also considered the question of extending the present schedule of prices for daywork and material, so as to cover measured work, but it was decided that the present schedule would meet all the needs of the members for some time to come, and as some of the prices may be altered in the near future, it was thought wise to defer altering the present schedule to some future date.

Cardiff Infirmary.—Sir Wm. Crossman Scheme.—With a view of assisting the Management Committee of the Infirmary, in their efforts to increase the funds of the Infirmary, a copy of the scheme has been forwarded to all the members, with a request that they should do all in their power to induce their workmen to adopt same. Up to the present half-a-dozen firms have intimated their intention to adopt the scheme.

Proposed Week's Holiday in August.—This subject is also being considered by the association, and the matter has been placed on the agenda of the South Wales Federation for consideration at the next meeting.

We are pleased to report that steps are being taken for the formation of a new association in Barry, and it is hoped that same will in the future become affiliated with the National and South Wales Federations.

Membership.—Several new firms were received as honorary members during the year.

A hearty vote of thanks to Mr. Turner for the very able manner in which he had conducted the affairs of the association during the past year was unanimously passed.

The election of officers for the current year was then proceeded with, and resulted as follows:—President, Mr. Wm. Thomas; vice-president, Mr. S. Shail; honorary treasurer, Mr. W. Symonds (re-elected); honorary auditor, Mr. G. Hallett (re-elected); committee, Messrs. J. E. Turner, S. Shepton, J. Allan, R. H. Bardo, C. C. Dunn, J. Gibson, G. Hallett, and W. T. Morgan.

WAKEFIELD ASSOCIATION.

Secretary: J. Beaumont.

A meeting of the members of the Wakefield and District Master Builders' Association was held at the Strafford Arms Hotel, Wakefield, on February 4th. Mr. Tom Lee (president) was in the chair. After the minutes of the last meeting had been read and confirmed on the motion of Mr. G. Crook, seconded by Mr. J. Pashley, the president referred in feeling terms to the death of Mrs. Saville, the wife of Mr. Joseph Saville, one of the honorary members of the association, and proposed a vote of sympathy and condolence with him in his bereavement. The resolution was seconded by Mr. E. A. Elvey and passed in silence by the members standing.

Housing, Town Planning, etc., Bill.—The president opened a discussion on this Bill, and made official reference to the clause therein providing for a quinquennial survey and registry of all property under £26 annual value in towns of 50,000 inhabitants and upwards, and under £16 annual value in districts under that population, and to the injustice which such a clause if passed would inflict upon owners of property. Councillor Spink, Mr. Henry Fallas, Mr. E. A. Elvey, Mr. G. Crook, Mr. J. Pashley, Mr. J. W. Sanderson entered into the discussion, and endorsed the views of the president on the question.

Wages Board.—The proposals of the Government to deal with the evils of sweating, etc., by way of a wages board were also considered, and the feeling of the members was that trades which were properly organised like the building trade should be exempted from such proposals.

New Members.—On the proposition of Mr. Elvey, seconded by Mr. Crook, Messrs. Bagnall Bros., of East Moor, Wakefield, builders and contractors, were elected members of the association; and on the proposition of Mr. Pashley, seconded by Mr. Fallas, Messrs. J. Kitson and Sons, of Denby Dale, were elected honorary members.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

The monthly meeting of the Leeds Association was held on Tuesday, February 9th. Mr. Wm. Irwin (president) was in the chair, and a large number of members were present. The minutes of the Yorkshire Federation were read and considered.

The president and the secretary reported upon the National Federation meetings recently held in London, and gave a résumé of the important business transacted.

On the invitation of the Leeds and Yorkshire Architectural Society, a meeting has been arranged to discuss the question of "The Preparation of Plans by Builders."

In view of the termination of the lease of the Leeds Builders' Exchange, a committee was appointed to consider the offers of rooms suitable for the meetings of the Association, and to report in due course.

Three applications were received for admission as associate members, and these were formally approved.

PORTSMOUTH ASSOCIATION.

Secretary: F. B. Roskell.

The thirty-sixth annual meeting of the Portsmouth and District Master Builders' and Building Trades' Association was held at the Sussex Hotel, on Tuesday evening, February 9th. Mr. M. Coltherup, the retiring president, occupied the chair at the commencement, and presided over a large attendance.

The annual report and balance-sheet, which were very satisfactory, having been received and adopted, Mr. Chamberlain, in proposing the election of Mr. Davies as president for the ensuing year, spoke in high terms of that gentleman's fitness to occupy the position.—Mr. Evans seconded the resolution, which was carried unanimously.—Mr. Davis, on taking the chair, briefly thanked the members for the honour conferred upon him.—A hearty vote of thanks was then accorded to the retiring president, who, in reply, thanked the committee and members for their kind co-operation during his term of office.—Mr. J. Harding and A. E. Porter, T.C., were then unanimously elected as senior and junior vice-presidents respectively, and Mr. J. Crockerell as treasurer. The following gentlemen were elected on the committee:—Messrs. M Coltherup, S. Salter, G. R. Chamberlain, W. J. Light, T.C., W. W. Evans, W. P. Wigmore, J. W Perkins, T.C., S. E. Sprigings, T.C., J. Durrant, Frank Aylen, W. H. Sabine, and C M. Dash (Gosport). A vote of thanks to the retiring auditors having been passed, Messrs. W. A. Carline and S. L. Norman were unanimously elected to act in that capacity for the ensuing year.

Several business matters were discussed.

In the 36th annual report of the committee, it is recalled that at the commencement of the year tenders were invited by the corporation for "emergency staircases" for the local Council schools without quantities being supplied, but following a letter of protest from the committee, fresh tenders were invited, quantities then being supplied.

In view of the proposed regulations contained in the report of the Departmental Committee appointed to inquire into the dangers attendant upon building operations, a resolution was passed by this association endorsing the efforts of the National Federation of Building Trade Employers in their recent appeal to the Home Office to have an opportunity of representing their views more fully by means of a deputation, and directed that a copy of the resolution be forwarded to the Home Secretary.

As a consequence of representations made by the speculative builders of Portsmouth with regard to new by-laws governing the trade, a joint conference was arranged by a committee representing both sides to discuss the matter. Subsequently a report was drawn up and submitted to the Roads and Works Committee, giving the views of the Master Builders' Association and the speculative builders, and asking for certain amendments, there being, in their opinion, reasonable grounds for same. It is understood that the question is receiving due consideration.

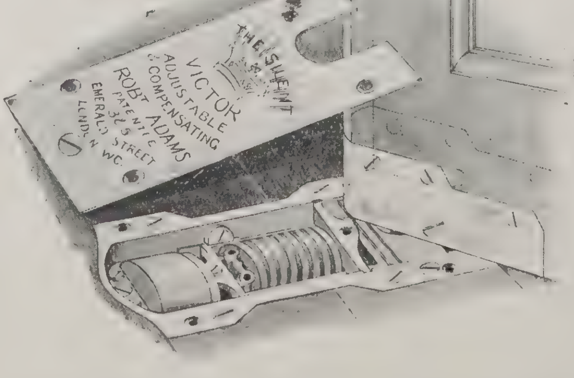
With regard to the recent action of the corporation in again inviting tenders without supplying quantities—this time for the proposed refuse destructor—the committee at once forwarded a letter protesting against their action, and requesting that quantities should be supplied. In this case, however, the protest was unsuccessful, as it was considered to be special work, for which quantities could not be prepared.

The committee draw attention to the fact that the BUILDERS' JOURNAL, of Caxton House, Westminster, is now the official organ of the National Federation, and urge upon members the duty of supporting it.

The association is still increasing in strength and numbers, and ten new members were elected last year.

The subscriptions during the year have been promptly paid, there being an increase on last year's subscription of £12 10s., and the balance-sheet shows a very satisfactory state of affairs.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.
PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE,
with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.
60 HIGHEST AWARDS.
The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing .
— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

MILNE'S

HOT WATER BOILERS

FOR COMBINED
HEATING AND DOMESTIC SUPPLY

No Incrustation.
Smoke Consuming and
Fuel Economising.

References Given.

Complete schemes and estimates on application.

Note.—These Boilers can only be obtained from

EDWARD P. MILNE,
Heating Engineer.
15, CRAVEN ST., LONDON W.C.

CARRON

ELECTRIC
RADIATORS.

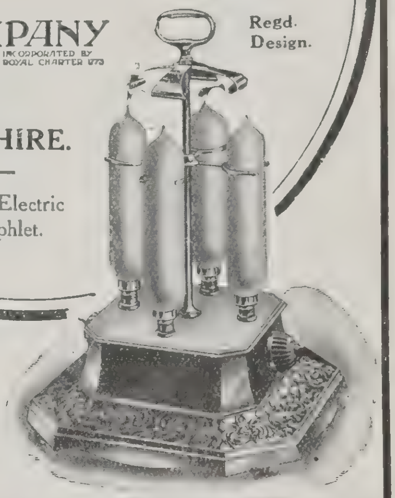
The 20th Century Method of Heating.

An ideal heating arrangement, suitable for all seasons, for Office, Shop, or the Home where Electricity is the lighting agent. No Smoke—No Smell—No Ash—No Fumes—No Labour—No Risk of Fire—No Waste. Only Electric Connection required.

CARRON COMPANY
INCORPORATED BY ROYAL CHARTER 1773

CARRON,
STIRLINGSHIRE.

Write for No. 8 Electric
Radiator Pamphlet.



Regd.
Design.

GRAND
PRIX,
Franco-British
Exhibition.

Practical Notes for Architectural Draughtsmen.

By ALFRED W. S. CROSS, M.A., F.R.I.B.A.
and ALAN MUNBY, M.A., A.R.I.B.A.

Complete Set Now Ready (27 Large Plates in a Portfolio), 12s.

POST FREE, 12s. 6d.

Prof. C. H. REILLY, of Liverpool University, says: "I think it is a very valuable book, and I hope it will find its way into most architectural offices."

THE "PRACTICAL NOTES" gives in most convenient form for use on the drawing board examples with concise rules, explanations and dimensions for preparing Designs, Perspectives and Working Drawings for Classical Architecture with rapidity and precision.

STUDENTS preparing for the examinations of the R.I.B.A. can learn how to draw The Orders correctly with the smallest possible amount of study and work by utilising the invaluable drawings and data given in this publication.

We shall be pleased to forward a copy of this work on approval to any of our subscribers.

THE MANAGER, TECHNICAL JOURNALS, LTD.
Caxton House, Westminster, S.W.

Descriptive Leaflet sent post free upon Application.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, **BUILDERS' JOURNAL,** *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Armathwaite.—For erecting a mixed elementary school, for Cumberland Education Committee. Mr. G. Dale Oliver, F.R.I.B.A., County architect, Carlisle:—

Exors. of W. Grisenthwaite ...	£3,452	2	4
J. Beaty	3,153	8	0
J. H. Reed and Sons	2,973	0	0
J. Laing and Sons	2,971	19	7
E. Musgrave,* Court Street, Carlisle	2,729	4	0

*Accepted.

Chatteris (Cambs.).—For carrying out alterations to Chatteris police station, for the Isle of Ely County Council:—

A. Scragg, March	£973	0	0
H. C. Papworth, March	943	5	0
E. Barrett, Chatteris	869	15	6
R. Shanks, Chatteris	855	0	0
G. W. Heath,* March	783	0	0

*Accepted.

Dartford (Kent).—For shaping out roads and kerbing, etc., drainage, etc., for Mr. W. P. Bleeze, Bromley. Messrs. Tait and Hobbs, architects, surveyors and engineers, Lowfield Street, Dartford. Quantities by Mr. John Hobbs:—

T. Knight	£1,020	0	0
Pedrette and Co.	922	6	9
G. Rayner	911	0	2
T. Wood and Sons	894	16	3
Parsons and Parsons	853	17	5
G. Bell and Sons, Ltd.	819	0	0
J. Lonsdale	769	0	0
J. W. Ellingham	768	0	0
J. Jackson	764	8	6
W. H. Wheeler	753	9	0
E. Bate and Co.	722	17	6
J. Trueman, Ltd.	719	0	0
A. E. Price,* Rochester	700	0	0

*Recommended for acceptance.

Liscard (Cheshire).—For erection of a masonic hall at Liscard, Cheshire. Mr. J. W. B. Harding, architect, 16, Cook Street, Liverpool. Quantities by Mr. J. C. Williams, 15, Huskisson Street, Liverpool:—

F. W. Mayor and Co.	£3,625	0	0
J. Hills and Sons	3,395	0	0
P. Rothwell	3,345	0	0
Haigh and Co.	3,287	0	0
A. Popple	3,274	0	0
Joseph Dolan and Sons ...	3,273	0	0
J. Paterson	3,270	0	0
G. Parker and Son	3,260	0	0
Dryland and Preston	3,229	15	0
Duthie and Dobson	3,224	0	0
A. Lloyd	3,200	0	0
Hall and Jamieson	3,197	0	0
J. Bellis	3,160	0	0
P. Tyson	3,142	0	0
J. A. M. Milestone, Park Street, Liscard	3,107	10	0
T. Spencer	3,000	0	0

*Accepted.

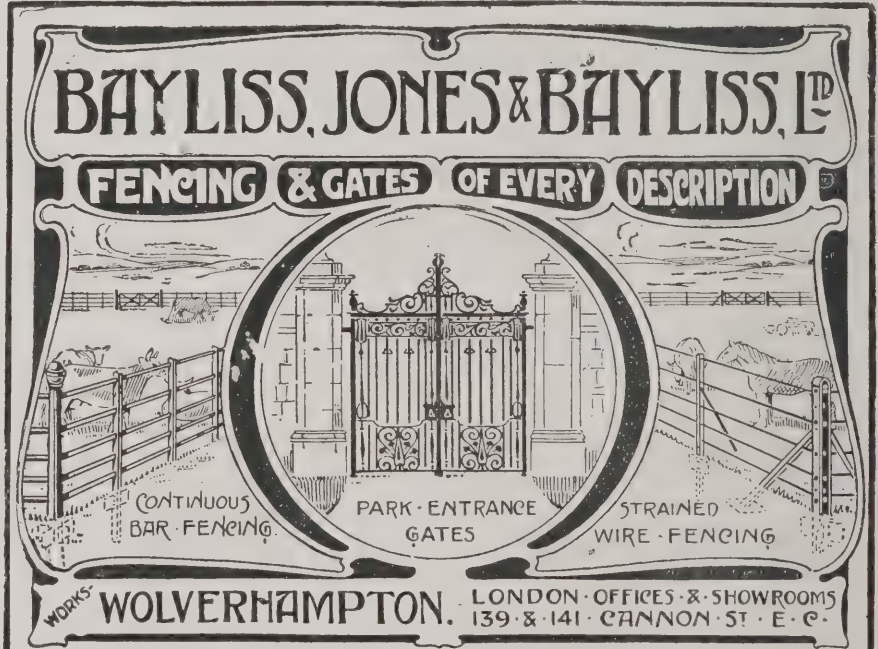
Llandaff.—For providing and laying about 1,300 yards of 12 in. cast-iron and 140 yards of earthenware pipe sewers, with manholes, etc., at Pencisley, in the parish of Llandaff, for the Llandaff and Dinas Powis Rural District Council. Mr. J. Holden, A.M.I.C.E., engineer, Park House, 20, Park Place, Cardiff:—

C. Sayers, Caerau	£3,304	0	7
R. Rankin, Cardiff	2,778	14	3
G. Pollard and Co., Ltd., Taunton	2,603	0	0
T. Taylor, Pontypridd	2,552	3	4
G. Rutter, Barry	2,468	9	1
Barnes, Chaplin and Co., Ltd., Cardiff	2,412	7	4
E. Osmond and Sons, Ely, near Cardiff	2,271	1	1
H. Smith, Newport, Mon. ...	2,247	11	5
C. Davies,* 55, Court Road, Cardiff	2,082	0	0

*Accepted.

(*Tenders continued on page viii.*)

(EST. 1887).
CITY OF LONDON
AND
FINSBURY DRAWING OFFICES
(LEWIS PITCHPINE, Manager),
Working Drawings,
Perspectives,
Designs,
Tracings,
Prints,
Quantities,
Telephone—1099 Central
Telegrams—"PITCHPINE, LONDON."
63, FINSBURY PAVEMENT, LONDON, E.C.


BAYLISS, JONES & BAYLISS, LTD.
FENCING & GATES OF EVERY DESCRIPTION
CONTINUOUS BAR FENCING.
PARK ENTRANCE GATES
STRAINED WIRE FENCING
WORKS WOLVERHAMPTON.
LONDON OFFICES & SHOWROOMS 139 & 141 CANNON ST. E.C.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs.
Premier Ironworks,
DEPTFORD, S.E.

FOLDING PARTITIONS. REVOLVING SHUTTERS.
Hartley Bros.,
2/- ft. Super.
1/- ft. Super.
GORTON, MANCHESTER.

LAUNDRY
and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE.
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

THE BUILDERS' JOURNAL BOOK LIST.
Being a comprehensive Catalogue of the most recent and authoritative text-books on various subjects connected with Architecture and the allied Arts of Design, Building Construction, and Engineering, together with their published prices. 1908.
Price 3d. Post Free, 3½d.
Technical Journals, Ltd., Caxton House, Westminster, London.

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork.

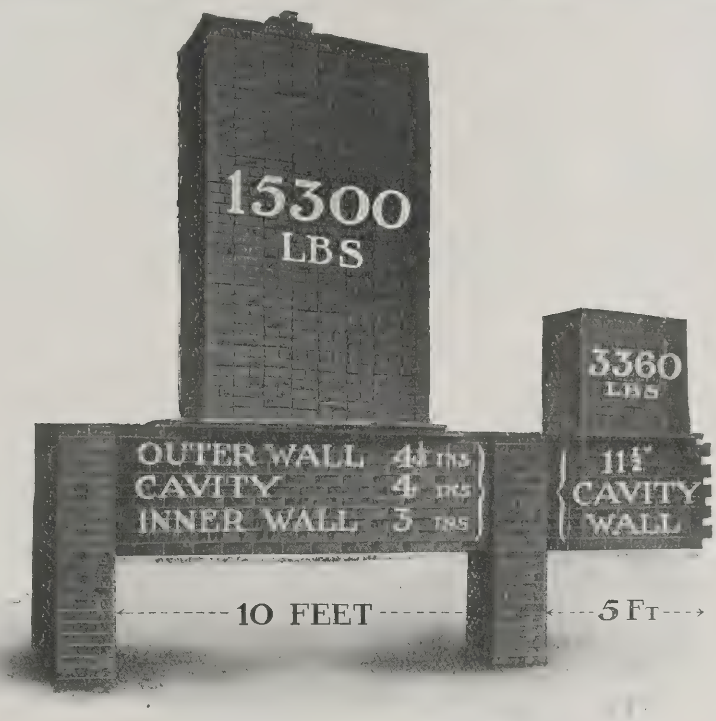
H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

Rd. JOHNSON CLAPHAM, & MORRIS, Ltd.,



Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered
Soundproof,
Fireproof
Dampproof,

Architects, Builders, and Contractors

Write for Descriptive Catalogue.

Engineering Department,
24, Lever Street,
MANCHESTER.

Telegrams; "Metallicus, Manchester."

Hollow Wall and Cantilever constructed of 4½-in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

Telephone: 6437 Manchester.

HOSPITALS, INFIRMARIES, SCHOOLS, &c., REQUIRE

MANCHESTER STOVES, GRATES, & VENTILATORS.

E. H. SHORLAND & BRO., Drake Street Works, MANCHESTER.

LIGHTNING CONDUCTORS

Supplied, Erected and Tested. Chimney Shafts Restored, &c.

J. LEWIS, 5 & 6, Great Winchester Street LONDON, E.C.

TELEPHONE No. 3053 CENTRAL.

BUTTERS BROS., CRANES for CONTRACTORS

WATERLOO STREET, GLASGOW.

"LIMPET" PATENT BOLTS & WASHERS

FOR CORRUGATED IRON SHEETS.

"There is no doubt in our mind that they ought to be regularly specified where iron sheeting is used."—*Vide* BUILDERS' JOURNAL.

Their great feature is the way in which they adjust themselves to the corrugation and make an **absolutely watertight joint.** They also retard the corrosive action in Galvanized Sheets and combine other advantages.

EXCLUSIVELY ADOPTED BY THE INDIAN GOVERNMENT, THE LEADING RAILWAYS AND MANY OF THE LARGEST MANUFACTURING CONCERNS IN ENGLAND AND THE COLONIES.

PRICE'S PATENT

The latest and most approved Fixing for joining Corrugated Iron Sheeting together.

REGISTERED TRADE MARK

LIMPET

Full particulars and samples from the Managing Agents—

WILLIAM JACKS & CO., 5, East India Avenue. LONDON, E.C.

Agents for Scotland: Frank G. Price & Co. 53, Waterloo St., Glasgow.

(*Tenders continued from page vi.*)

London.—For erection of new school, Buxton Street, Whitechapel, for the London County Council:—

F. and T. Thorne, Isle of Dogs	£13,803
W. Shurmur and Sons, Ltd., Upper Clapton	13,082
J. Appleby and Sons, Southwark Park	12,816
L. H. and R. Roberts, Islington	12,641
Patman and Fotheringham, Ltd., Islington	12,623
McCormick and Sons, Essex Road	12,512
T. D. Leng, Deptford	12,508
Killby and Gayford, Ltd., Worship Street	12,472
J. Chessum and Sons, 7a, South Place	12,404
Perry and Co. (Bow), Ltd., Bow	12,048
E. Lawrance and Sons, Wharf Road, City Road	11,987
Kirk and Randall, Woolwich	11,944
C. P. Roberts and Co.,* 138, St. Paul's Road, Highbury	11,723

Architect's (Education) estimate, £12,491.

*Recommended for acceptance.

London, E.—For new iron gun and drill sheds, and converting drill-hall into riding school, etc., at Artillery House, Stratford Green, for the Territorial Force Association:—

	£	s.	d.
C. Castle and Son, Hackney	£2,200	0	0
W. Lawrence and Sons, Waltham Cross	1,792	0	0
Harris and Wardrop, Limehouse, E.	1,788	0	0
C. R. Price, 129, Bishopsgate Street Without, E.C.	1,757	0	0
Allen Bros.,* 2, Station Road, Chingford	1,479	14	5

*Accepted.

London, S.W.—For erection of a police station house at Yeoman's Row, Walton Street, S.W. Mr. J. Dixon Butler, F.R.I.B.A., architect and surveyor, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son, and Chidgey, 8, Adelphi Terrace, Strand, W.C.:—

C. Ansell	£7,000
McCormick and Son	6,750
Harris and Wardrop	6,743
Shurmur and Son	6,660
Holloway Bros., Ltd.	6,570
Willmott and Sons	6,559
Higgs and Hill, Ltd.	6,484
Lovatt, Ltd.	6,444
Leslie and Co., Ltd.	6,376
Howlem and Co., Ltd.	6,349
F. and H. F. Higgs	6,340
Ashby and Horner	6,263
Prestige and Co., Ltd.	6,175

*Accepted.

Moseley (Birmingham).—Acepted for completing the restoration of the parish church. Messrs. J. Chatwin and Son, Birmingham, architects:—

Godfrey and Collins, Tewkesbury, £6,782.

Norwich.—For erection of additions to the infirmary at the house, for the Guardians:—

Daws	£13,050
Smith	12,770
Youngs	12,541
Hawes	12,498
Scarles	12,487
Hurn	12,095
Yelf	11,994
Greengrass	11,858
Gill	11,754
Hannent*	11,739

Surveyor's estimate, £11,650.

*Recommended for acceptance.

Portsmouth.—For rebuilding business premises, Osborne Road, Southsea, for Mr. J. Wickens. Messrs. Rake and Cogswell, architects:—

Light and Son	£947
Davis	918
S. Salter	880
J. Croad	870
F. Privett	827
F. Corke	824
Lay and Co.	819
Bishop Bros.	800
J. Crockerell	798
H. Jones	778
M. Coltherup*	775

All of Portsmouth.

*Accepted.

Portsmouth.—Accepted for rebuilding business premises, Commercial Road, for Messrs. Timothy White and Co. Messrs. Rake and Cogswell, Portsmouth, architects.

J. Croad, Portsmouth, 3,314 12s.

Portsmouth.—For additions to the Jewish Synagogue, Portsmouth, for Alderman Leon Emanuel, J.P. Messrs. Rake and Cogswell, architects, Portsmouth:—

Salter	£1,375
Crockerell	1,322
Corke	1,308
Croad	1,280
Jones	1,267
Privett*	1,247

All of Portsmouth.

*Accepted

Rednal (Worcs.)—For erecting a public reading room, for King's Norton and Northfield Urban District Council. Mr. Benjamin Bower, architect, Temple Street, Birmingham. Quantities by Mr. George Kenwrick, Colmore Row, Birmingham:—

	£	s.	d.
F. L. Gibbs	£852	4	7
J. Atkinson	678	0	0
G. E. Cragg and Son	620	0	0
W. Sapcote and Sons	620	0	0
W. Willetts and Sons	612	0	0
T. Johnson	587	0	0
R. Matthews	576	5	5
W. T. Ingram and Sons	558	0	0
J. E. Harper	552	17	8
A. R. Waldron,* 202, Station Road, King's Heath	545	10	0

*Accepted.

Sutton (Surrey).—For the erection of a house in the Worcester Road, for Mr. Gerald Pilditch. Messrs. Frank Chown and Sheffield, architects, 2, Princes Street, Hanover Square, W. Quantities by Messrs. Andrews and Read, 13, Basinghall Street, E.C.:—

Gathercole Bros.	£1,960
G. Parker and Son	1,937
E. J. Saunders	1,924
J. Smith and Sons	1,897
Cropley Bros., Ltd.	1,887
B. E. Nightingale,* London	1,755

*Accepted.

Thrybergh.—For working men's club, Thrybergh, near Rotherham, for the Trustees. Mr. P. A. Hinchliffe, A.R.I.B.A., architect and surveyor, 14, Regent Street, Barnsley:—

Chadwick and Co.	£2,750
J. Cooper	2,643
W. Thornton and Son	2,631
R. Snell	2,492
W. H. Trehern	2,420
J. R. Newton	2,154
W. M. Breden,* Thrybergh, Rotherham	2,054

*Accepted.

Usworth (Durham).—Recommended for acceptance for erection at Usworth of 50 houses for the working classes, for the Durham County Council.

Johnson and Son, East Boldon, £9,760 14s. 9d.

Worksop.—For erection of offices in Carlton Road, Worksop, for the Worksop Waterworks Company. Mr. A. H. Richardson, architect, Market Place, Worksop:—

	£	s.	d.
D. Gill and Son, Doncaster	£2,077	0	0
Ilett and Sons	2,025	0	0
W. and A. Forsdike, Ltd., Sheffield	1,985	0	0
I. Doncaster	1,950	0	0
Bowles and Sons	1,942	0	0
G. G. Middleton	1,936	0	0
C. A. Leverton	1,919	18	0
F. I. Rowsell	1,804	15	0
Perks and Son, Ltd.,* Long Eaton, Notts.	1,699	0	0

Rest of Worksop.

*Accepted.

'Phone Holborn 1562.

The Brilliant Sign Co. 1907 Ltd.

Original Manufacturers of Brilliant Sunk Gilt Copper Window Letters.

THE LARGEST MANUFACTURERS IN THE WORLD OF

PLATE GLASS FACIAS
STALLPLATES
SWING SIGNS
GILT WOOD LETTERS
ILLUMINATED SIGNS
(of every known style)
REPOUSSÉ COPPER WORK
WINDOW LETTERS

Guaranteed Best Work—Keenest Rates in the Trade.

60 pp. Illustrated Art Catalogue Free.

Wire: "Signboards, London."

38 Grays Inn Rd London W.C.

BRILLIANT SUNK GILT COPPER PLATE GLASS FACIAS, &c.

PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART

TELEPHONE Nos 9492 Central

MEASURES BROS LTD 53B SOUTHWARK ST LONDON S.E. & PITLAKE, CROYDON.

TELEPHONE No 171 CROYDON.

10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.

SECTION SHEETS, BOOKS & PRICES ON APPLICATION.

CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.

STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

Feb. 26. TREALAW.—Erection of a retaining wall at Baithweunydd Road, for the Rhondda U.D.C. Plans and specification, and forms of tender, at the public offices, Pentre, on deposit of one guinea. Tenders, endorsed "Tender for Retaining Wall," by 10 a.m. on Feb. 26, to the chairman of the council, public offices, Pentre; fair wages clause.

Feb. 26. LIVERPOOL.—Execution of drainer, bricklayer, ironfounder, joiner, plumber, painter, glazier, patent glazing, plasterer, tiler, heating and ventilating, electric lighting, lifts, ornamental metalwork, marble mason, metal window casements, and sanitary fittings, works at New Chief Offices, for the Royal Liver Friendly Society, Liverpool. Names to W. Aubrey Thomas, architect, 14, Dale Street, Liverpool, by Feb. 26.

Feb. 27. BRIDGEND.—Erection of a nursery block at the cottage homes, for the guardians of the union. Plans, etc., and all particulars, at the office of P. J. Thomas, architect, Bridgend. Tenders, endorsed "Nursery," by Feb. 27, to R. Harmar Cox, clerk, union offices, Bridgend.

March 1. SOUTHAMPTON.—Erection of an additional classroom for 60 children and two cloakrooms at Butlock's Heath council school, for the C.C. Apply at the office of W. J. Taylor, county surveyor, the Castle, Winchester. Tenders, by 10 a.m., on March 1, to H. Barber, clerk to the C.C., the Castle, Winchester.

March 1. BOLTON-UPON-DEARNE. — Erection of walls, etc., Recreation Ground, Goldthorpe, for the U.D.C. Specifications, bill of quantities, etc., of the surveyor at his office, between 10 a.m. and 4 p.m., upon deposit of 10s. 6d. Tenders, endorsed "Wall," by March 1, to J. Ledger Hawksworth, clerk, council offices, Station Road, Bolton-upon-Dearne, Rotherham.

March 1. TREGARE (MON.).—Erection of a new vicarage for the parish of Tregare, near Raglan, for the Rev. William Evans. Plans and specification at Hereford, or at the vicarage. Bills of quantities and form of tender, from Ernest G. Davies, M.S.A., architect, 132, Widemarsh Street, Hereford, and at Monmouth, on deposit of £1 1s. Tenders to the vicar, first post on morning of March 1.

March 1. PONTYPRIDD.—Erection of 20 houses or more at Pwllgwaun, Pontypridd, for the Llwynmadoc Building Club. Plans and specifications, and form of tender, on application to Edward Rees, architect and surveyor, Alexandra Chambers, Pontypridd. Tenders, endorsed "Llwynmadoc Building Club," by March 1, to J. W. Kinsman, A.C.A., secretary, Alexandra Buildings, Pontypridd.

March 2. STORNOWAY.—Erection of spire for church, for Deacons' Court of United Free English Church, Stornoway. Apply to Neil Maccallum, clerk to Deacons' Court, Stornoway, to whom submit tenders by March 2.

March 2. TREORCHY.—Erection and completion of eight or more houses at Pencelli Estate, for Messrs. Davies and others. Plans, specification, and form of tender, of the architect. Tenders by March 2, to W. D. Morgan, M.S.A., architect, 194, Ystrad Road, Pentre.

March 2. BRAY.—Erection of public library at junction of Florence Road and Eglinton Road, for the U.D.C. Apply, J. Charles Wilmot, C.E., 3, Lower Merrion Street, Dublin. Tenders at the meeting of the library committee, at 10 a.m., on March 2. £2 2s. deposit. Fair wages clause.

March 3. BATLEY, YORKS.—Erection of new church of St. Andrew, Purlwell, Batley, for the building committee. Apply to architects, Hoare and Wheeler, 11a, Orchard Street, London, W., also at the office of C. H. Marriott, Son, and Shaw, Church Street Chambers, Dewsbury. Tenders by noon, on March 3, to the honorary secretary, 77, Dark Lane, Batley, Yorks. £2 deposit.

March 3. MANSELTON, SWANSEA. — Erection of a new Baptist chapel, school, and classrooms, etc., at Manselton, Swansea. Plans with the secretary, E. Davies, 27, Manselton Road, Swansea, or with W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff, where bills of quantities may be obtained on deposit of three guineas. Tenders to the Secretary by March 3.

March 4. GOSFORTH.—Alteration and addition to shop and stores, for the Egremont Industrial Co-operative Society, Limited. Plans and specifications on premises at Gosforth, or at the office of W. G. Scott and Co., architects and surveyors, Workington. Tenders, endorsed "Gosforth Branch," to the Egremont Industrial Cooperative Society, Limited, by March 4.

March 4. PONT LLANIO.—Widening masonry bridge, erection of parapet and wing walls, etc., at Pont Llanio, for the Cardiganshire C.C. Drawings and specifications at the office of the county surveyor. Copies of specification and particulars on deposit of £1 1s. Tenders, endorsed "Widening of Pont Llanio Bridge," by 4 p.m. on March 4, to Thomas E. Owen, county surveyor, Dinas terrace, Aberystwyth.

March 5. RUGBY.—Erection of public baths, for the U.D.C. Persons desirous of tendering should apply to D. G. MacDonald, engineer and surveyor. Tenders to be submitted by March 5.

March 5. NOTTINGHAM.—Erection of a Telephone Exchange at Nottingham, for the commissioners of H.M. Works and Public Buildings. Drawings, specification, conditions, and form of contract, on application to the clerk of works, head post office, Nottingham. Bills of quantities and forms of tender of the secretary, on deposit of £1 1s. Tenders before noon on March 5, to the Secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., endorsed "Tender for Nottingham Telephone Exchange."

March 6. OGMORE VALE.—Erection of a new church at Ogmore Vale. Plans, specifications, and bills of quantities, at offices of J. Cook Rees, architect, Parade Chambers, Neath. Tenders to the Rev. A. J. Edwards, The Vicarage, Ogmore Vale, by March 6, endorsed "Tender for Church."

March 8. ARMAGH.—Erection of additional offices in connection with the County Courthouse, at a cost not exceeding £750, for the C.C. Forms of tender, and plans and specification, of Joseph Atkinson, county secretary, County Courthouse, Armagh. Tenders, endorsed "Extension of Offices," by 3 p.m. on March 8, to the secretary.

March 8. GROESFAEN (near Bargoed). —Erection of 30 houses at Groesfaen, for the Rhymney Iron Company (Limited). Drawings and specification at the office of J. Llewellin Smith, M.S.A., architect, Aberdare. Tenders, endorsed "Tender—30 houses," to the Rhymney Iron Company (Limited), Rhymney, Mon., by March 8.

March 11. STOCKBRIDGE.—Erection of a new Council school (for 220 children) at Stockbridge, for the C.C. Plans, specifications, and conditions of contract, bills of quantities and other information, of W. J. Taylor, county surveyor, The Castle, Winchester. Deposit of £2 2s. for bills of quantities and form of tender, by cheque, payable to the Hants C.C., crossed Bank of England. Tenders, endorsed "Proposed Council School, Stockbridge," by ten a.m. on March 11, to H. Barber, clerk to the C.C., The Castle, Winchester.

March 12. WAKEFIELD.—Erection of schools at Wombwell, and at Aston-with-Aughton, for the West Riding Education Committee. Tenders by 10.30 a.m., on March 12, to Francis Alvey Darwin, clerk of the C.C., County Hall, Wakefield, to whom apply. £1 deposit in each case, to West Riding treasurer, county hall, Wakefield.

March 13. PERTH.—Construction of greenhouses, etc., at Wellshill cemeteries, for the T.C. Plans, specifications, and forms of tender, at office of James W. Bayne, superintendent of cemeteries, Wellshill, Perth. Tenders with John Begg, town clerk, Perth, endorsed "Tender for greenhouses," by March 13.

March 15. BIRKENHEAD.—Erection and completion of twenty-two double tenement corporation dwellings. Apply to Chas. Brownridge, M.I.C.E., borough engineer and surveyor, town hall, Birkenhead, to whom submit tenders by March 15.

March 16. ENFIELD.—Erection of a block of schools at Lavender Road, for the education committee. Apply to the architect, G. E. T. Laurence, 22, Buckingham Street, Adelphi, W.C., before Feb. 27. Tenders by noon, on March 16, to N. Hepworth, clerk, public offices, Enfield. £3 3s. deposit. Fair wages clause.

No date. SWANSEA.—Erection of a new block of offices in York Street, Swansea, for T. T. Pascoe. Apply to Margrave and Peacock, architects, Metal Exchange, Swansea. £5 5s. deposit (cheque).

No date. HEXHAM.—Erection of a cottage on the Woodley Field Estate. Names for selection to Edward Cratney, architect, 161, High Street East, Wallsend; quantities supplied.

ENGINEERING.

Feb. 25. STEPNEY, E. Supplying condenser pipe work (partly sub-aqueous), settling tanks, valve chamber, and river wall at Blyth's Wharf, Narrow Street, Limehouse, E., for the corporation. Drawings, stipulations, specifications, schedule, and form of tender of the borough engineer, M. W. Jameson, A.M.Inst.C.E.), municipal offices, Great Alie Street, Whitechapel, E. £5 Bank of England note deposit. Tenders, endorsed "Tender for River Works, Blyth's Wharf," by noon Feb. 25, to Geo. W. Clarke, town clerk, municipal offices, Great Alie Street, Whitechapel, E. Fair wages clause.

March 1. METHLEY.—Construction of storage tanks in re-inforced concrete, for the U.D.C. Particulars and plan of the engineer, John S. Richardson, East Parade Chambers, Leeds, on deposit by cheque of £2 2s. Tenders, endorsed "Pinder Green and Scholey Hill Sewerage—Contract No. 3," by noon on March 1, to R. S. Wigin, clerk, 83, Albion Street, Leeds.

March 2. BRIGHOUSE.—Supplying a 5-ton hand travelling crane, delivered and fixed at proposed transforming station, Huddersfield Road, for the corporation. Particulars and form of tender of S. S. Haywood, borough surveyor. Tenders, endorsed "Tender for Hand Crane," to the town clerk, municipal offices, Brighouse, by March 2.

March 2. BELFAST.—Construction of a bridge across the River Lagan at Stranmillis, for the corporation, either steel in accordance with drawing and specification by the city surveyor, or for concrete in accordance with specification of the city surveyor, and to designs by the contractors. Specifications, forms of tender, and other particulars at the office of the city surveyor, on deposit of £1. Tenders, endorsed "Stranmillis Bridge," by 10 a.m., on March 2, to Saml. Black, town clerk.

March 3. ASHTON-UNDER-LYNE.—Supplying (a) one water-tube boiler, and (b) one engine-driven induced draught fan, for the corporation. Apply to the borough electrical engineer, Wellington Road, Ashton-under-Lyne. Tenders by noon on March 3, to John Neal, borough comptroller, town hall, Ashton-under-Lyne. £1 1s. deposit.

March 4. ACKERGILL, CAITHNESS-SHIRE, N.B.—Construction of a reinforced concrete slipway and execution of other works for the Committee of Management of the Royal National Lifeboat Institution. Apply to G. Jamieson, at Wick, or at the office of the engineer and architect, W. T. Douglass, M.Inst.C.E., 15, Victoria Street, Westminster, London, S.W. Tenders before noon on March 4, to Charles Dibdin, secretary, 22, Charing Cross Road, London, W.C. £1 deposit, also 3s. 6d. not returnable.

March 8. CAMBRIDGE.—Supply and erection of sewage pumping plant, including gas engines, centrifugal pumps, and cast-iron mains, capable of delivering 10 million gallons in 24 hours, for the corporation. Specification, plan, and form of tender at the borough surveyor's office, Guildhall, Cambridge. Tenders by March 8, to J. E. L. Whitehead, town clerk, Guildhall. £2 2s. deposit.

March 11. LYMINGE, NEAR FOLKESTONE, KENT.—Lighting of the Workhouse at Lyminge, for the guardians of Elham Union. Designs and specifications to be supplied free of cost. Tenders by March 11, to R. Lonergan, clerk, 11, Cheriton Place, Folkestone.

IRON AND STEEL.

Feb. 27. BRADFORD.—Supply and delivery of 700 tons of steel girder tram rails of the British standard section No. 4, for the corporation. Drawing, specification, and form of tender at the office of W. H. S. Dawson, city engineer and surveyor, town hall, Bradford. Tenders, endorsed "Tender for Steel Tram Rails," by Feb. 27, to Frederick Stevens, town clerk, town hall, Bradford. Fair wages clause.

Feb. 27. SHEFFIELD.—Supplying lamp posts and tulips, pillar heads, copper lamps, and lamp bottoms, for the corporation. Particulars and forms of tender, with conditions of contract at the office of the lighting superintendent, 42, Corporation Street, Sheffield, on deposit of ten shillings. Tenders, addressed to the chief constable, to be delivered to the central police offices, Castle Green, by Feb. 27. Applications to be endorsed "Manufactured articles."

March 1. METHLEY.—2, Supplying and delivering 817 yards of 6in. cast-iron socketed pipes at the station, for the U.D.C. Apply to John S. Richardson, East Parade Chambers, Leeds. Tenders by noon on March 1, to R. S. Wigin, clerk, 83, Albion Street, Leeds; (see also "Plumbing and Sanitary").

March 1. LURGAN.—Supplying and erecting about 300 yards of wrought iron unclimbable fencing, 5ft. 6in. high, for enclosing public park from roadway, curved to gate approach, also ornamental entrance gates 12ft. wide, with two side gates attached, with or without pillars; also one entrance gate, 10ft. wide, without pillars. Gates limited to £50 and fencing to 10s. per yard, all for the T.C. Drawings and specification, with prices, by March 1, to F. W. Pollock, clerk of council, town hall, Lurgan.

March 6. COVENTRY.—Supply and delivery of cast-iron pipes, lead pipes, solder, hydrant and valve boxes, for year ending March 31, 1910, for the corporation. Form of tender and particulars of the engineer. Tenders by 10 a.m., on March 6, endorsed "Tender for Waterworks Stores," to J. E. Swindlehurst, M.Inst.C.E., water engineer, Saint Mary's Hall.

PAINTING.

Feb. 25. ATCHAM.—Painting, etc., at the boardroom and offices, St. John's Hill, Shrewsbury, for the guardians of the union. Specifications at the office of E. P. Everest, clerk to the guardians, union offices, St. John's Hill, Shrewsbury, to whom send tenders, endorsed "Painting," by Feb. 25.

Feb. 27. BLAINA.—Painting the schoolroom and classrooms attached to the English Wesleyan Church. Particulars on application to W. R. Miles Jones, Cwmcelyn Road, Blaina, to whom send tenders by Feb. 27.

March 1. LONDON.—Painting, colouring, cleansing, repairs, and alterations at the infirmary, Rackham Street, Notting Hill, W., for the St. Marylebone Board of Guardians. Specifications and forms of tender upon application to the steward, between 10 and noon, up to Feb. 27. Tenders, endorsed "Tenders for Painting, etc., Infirmary," by 10 a.m., on March 1, to Henry T. Dudman, clerk to the board, guardians' offices, Northumberland Street, Marylebone Road.

March 3. LEEDS.—Cleaning down, painting, etc., various police stations for the corporation. Apply to W. T. Lancashire, city engineer, Municipal Buildings, Leeds. Tenders by 10 a.m. on March 3, to the town clerk, town hall, Leeds.

PLUMBING & SANITARY

Feb. 25. KEIGHLEY.—Excavating and laying about 840 lineal yards of 4-in. water mains between Steeton and Eastburn. Also re-construction of sewer in Steeton, for the R.D.C. Specifications and bills of quantities from Thomas Burton, 248, Oakworth Road, Keighley, to whom submit tenders by Feb. 25.

March 1. METHLEY.—Laying 1,250 yards 15in. and 12in. stoneware pipe sewers and 817 yards 6in. cast-iron rising main; construction of engine house, circular tank, percolating filters, etc., for the U.D.C. Apply to John S. Richardson, East Parade Chambers, Leeds. Tenders by noon on March 1, to R. S. Wigin, clerk, 83, Albion Street, Leeds; £3 3s. deposit (cheque) (see also "Iron and Steel").

March 1. BLABY.—Construction of 950 lineal yards of new stoneware pipe sewers with manholes and ventilators, construction of open septic tanks, effluent drains, irrigation works, air compressor station, etc., in Narborough and Whetstone, for the R.D.C. Plans and specification and bill of quantities at the office of the engineer and surveyor, J. Turner, Blaby Road, South Wigston, between 9 and 10 a.m., on deposit of £1 1s. Tenders, endorsed "Contract No. 3," by March 1, to B. A. Shires, clerk to the council, 1, Friar Lane, Leicester.

March 4. STAVERTON.—Constructing sewage outfall works, and laying sewers in the parish of Staverton, for the Daventry R.D.C. Apply to the engineer to the council, J. B. Williams, the Moot Hall, Daventry. Tenders by March 4, to J. D. Spearing, clerk to the council, the Moot Hall, Daventry. £2 2s. deposit.

March 9. BARNOLDSWICK.—Supplying materials and construction of about 292 lineal yards of 15-in. cast-iron and 139 lineal yards of 18-in. fireclay pipe sewers, with manholes, etc. Also construction of settling tanks, circular filters, sludge beds, and other incidental works. Drawings, specification, form of tender, and quantities, at office of W. Bennett, M.I.Mun.E., engineer and surveyor to the council, town hall, Barnoldswick, on deposit of £2 2s. Tenders, endorsed "Tender for Sewage Works," to W. E. Harper, chairman of the sanitary committee, town hall, Barnoldswick, via Colne, by March 9.

March 16. LONDON.—Construction of a sewer, for the L.C.C., mainly of cast iron, lined with concrete and blue brick, 7ft. internal diameter, total length about 14,770ft., to be formed in tunnel, with weir chambers, manholes, side entrances, ventilators, etc., between Grosvenor Crescent and Warwick Road, Kensington. Drawings, specifications, bills of quantities, form of tender and other particulars of chief engineer, Maurice Fitzmaurice, C.M.G., at County Hall, Spring Gardens, S.W., upon deposit with cashier of council of £10. Tenders by 11 a.m., on March 6, to G. L. Gomme, clerk of L.C.C., County Hall, Spring Gardens, S.W. Fair wages clause.

ROADS AND CARTAGE.

Feb. 26. HARTLEPOOL.—Supply road material for the Union R.D.C. Particulars obtainable from Mr. Burton, road surveyor, Greatham, via Stockton-on-Tees. Tenders by noon on Feb. 26, to George Kilvington, clerk to the R.D.C., union offices, West Hartlepool.

Feb. 26. PORTH.—Ballasting, metalling, paving, kerbing, channelling, etc., the following streets under the Private Street Works Act, 1892, for the Rhondda U.D.C.:—Birchgrove Street, Charles Street, School Street, Brynheulog Terrace, Bryn Terrace, Porth. Plans and form of tender at the office of the engineer and surveyor, public offices, Pentre, Rhondda, on deposit of £1 1s. Tenders, endorsed Birchgrove Street improvements, to the chairman of the council, public offices, Pentre, by 10 a.m., on Feb. 26. Fair wages clause.

Feb. 27. DURHAM.—Supply road metal, cartage, and team labour, and tools and stores, etc., for the C.C. Forms of tender at the county surveyor's office, Shire Hall, Durham, where tenders addressed to William Crozier, A.M.I.C.E., county surveyor, are to be delivered by Feb. 27.

Feb. 27. ARBROATH.—Quarrying, carting, and breaking metal, required for roads for one year from Whit Sunday next. For particulars apply to F. Minto, at 1, Hillend Road, Arbroath, until Feb. 26. Offers with W. K. Macdonald, town clerk, Arbroath, by February 27.

Feb. 27. BILLESDON.—Supplying during year ending March 31, 1910, granite, broken to 2in. and 1¼in. gauge, and granite chippings, for the R.D.C. The whole must, if required, be delivered before Oct. 31. Tenders (forms of W. E. Richardson, clerk, 18, New Street, Leicester), and samples, to the workhouse, Billesdon, by Feb. 27.

Feb. 27. HUCKNALL TORKARD (NOTTS.).— Supplying 3,400 square yards hand-made 2½in. concrete flags; 2,000 lineal yards 12in. by 6in. flat concrete bull-nosed kerbs, 3ft. lengths; 45 ditto circulars, 2ft. 6in. radius; 900 lineal yards 10in. by 12in. Yorkshire kerbing, rolled on top and on both sides to the depth of 4ins, 4ft. lengths; 100 lineal yards ditto circulars, 2ft. 6in. radius; 350 tons 4in. by 4in. granite setts; 1,300 lineal yards creosoted wood fencing, posts to be 6ft. 6ins. long and 7ins. by 3½ins., posts every 6ft., rails 12ft. and 4ins. by 1½ins., two deep; pales, 5ft. and 2¼ins. by 2¼ins., angular and pointed, 3ins. apart, for the U.D.C. Forms of tender of the surveyor, William Swann, council offices, Hucknall Torkard. Tenders, endorsed "Tenders for Materials," by Feb. 27, to Parker Woodward, solicitor, clerk to the council, council offices, Hucknall Torkard, Notts.

March 1. GLASGOW.—Paving various streets in the City with rock asphalte, for the corporation. Apply at the office of public works, City Chambers, 64, Cochrane Street. Tenders to A. W. Myles, town clerk, City Chambers, Glasgow, by 10 a.m., on March 1.

March 1. SUTTON-IN-ASHFIELD.—Supplying tar macadam and broken slab, for the U.D.C. Form of tender and specification from Walter Burn, A.M.I.C.E., surveyor's office, Sutton-in-Ashfield. Tenders by 10 a.m. on March 1, to John D. Fidler, clerk, clerk's office, Forest Street, Sutton-in-Ashfield.

March 1. TENTERDEN, KENT.—Supplying quartzite, basalt, or other approved macadam; carriage of the above; supply and delivery of Kent ragstone and ragstone chippings; and mason's work; for the Corporation. Apply to W. L. C. Turner, borough surveyor, town hall, Tenterden, to whom samples should be sent. Tenders by March 1, to J. Munn Mace, town clerk, Tenterden, Kent.

March 1. STREATHAM.—Making up and paving Woodnook Road, Streatham, for the Corporation of Wandsworth. Specification and drawings, etc., at the borough engineer's office, New Streets Department, 56, East Hill, Wandsworth, S.W. Tenders, endorsed "Tender for paving Woodnook Road," by 4 p.m. on March 1, at the Council House, East Hill, Wandsworth, S.W., in box provided; fair wages clause.

March 1. BRADFORD.—Repair of the district roads in following parishes: Bucklebury, Grazeley, Marlston, Sulhamstead, Bannister (lower end), Ufton, and Wokefield, for the R.D.C. Form of specification, etc., on application to John Forrester, district surveyor, Theale, near Reading. Tenders marked "District Roads," by noon on March 1, to R. E. Rawstorne, clerk to the council, 4, Bridge Street, Caversham, near Reading.

March 1. BOLTON-UPON-DEARNE.—Supplying materials for year ending March 31, 1910, for the U.D.C.:—Broken granite, granite chippings, rough dross, handbroken dross, dross screenings, flags, kerbs, setts, channelling, asphalte, pipes, etc. Form of tender of the clerk, endorsed "Materials," by March 1, to J. Ledger Hawksworth, clerk, council offices, Station Road, Bolton-upon-Dearne, Rotherham.

March 1. SHEPTON MALLET.—Cleansing and maintenance of highways; steam rolling and scarifying; supply and delivery of limestone, granite, basalt, gravel, and sand, for three years from March 31, 1909, for the R.D.C. Forms, with specification, form of contract, from James Neish, surveyor to the council, Charlton, Shepton Mallet, or from the clerk. Samples of materials free of cost. Tenders, endorsed "Tender for Road Repairs, etc.," by 10 a.m. on March 1, to A. E. Nalder, clerk, council offices, Shepton Mallet.

March 2. NORTHAMPTON.—Supplying broken granite, for the C.C. Tenders by March 2, to C. S. Morris, county surveyor, county hall, Northampton.

March 3. SALISBURY. — Execution of works in Bourne Avenue, from the London Road to the Salisbury school, for the T.C. Plan and specification, and bill of quantities, etc., of W. J. Goodwin, A.M.Inst.C.E., city engineer and surveyor, municipal offices, Salisbury. Tenders, endorsed "Private Street Works, Bourne Avenue," by 4 p.m. on March 3, to Francis Hodding, town clerk, Municipal Offices, Salisbury.

March 3. NORTHAMPTON.—Carting metal from railway stations and wharfs to various main roads in Finedon, Irthlingborough and Rothwell, Brixworth, Easton-on-the-Hill, Gretton, Kettering, Oundle, Oxenden, Northampton, Hardingstone, Towcester, Thrapston, and Wellingborough, for the C.C. Tenders by March 3, to C. S. Morris, county surveyor, county hall, Northampton, to whom apply.

March 6. ALSAGER.—Making up a road for the U.D.C. Forms of tender and bills of quantities, from H. V. Lynam, surveyor to the council, Alsager, to whom submit tenders by March 6, endorsed "The Avenue Road."

March 6. DRIFFIELD.—Supplying for year ending March 31, 1910, about 7,000 tons of whinstone, 2,500 tons of broken slag, 600 tons of sea cobbles, 300 tons of sea gravel, 200 tons of tarred chips, for the R.D.C. Particulars and forms of tender of T. Casson Beaumont, surveyor, Driffield, to whom, tenders, endorsed "Tenders for Materials," by March 6.

March 13. COVENTRY.—Supply and delivery of the following materials during year ending March 31, 1910, for the Corporation:—Broken roadstone, granite kerbs, granite setts, stoneware pipes, castings, workmen's tools. Form of tender and full particulars of the engineer and surveyor. Tenders, by 10 a.m., on March 13, endorsed "Tender for Materials," to J. E. Swindlehurst, M.Inst.C.E., city engineer and surveyor, Saint Mary's Hall.

MISCELLANEOUS.

Feb. 25. ASHTON-UNDER-LYNE.—Supplying during year ending March 12, 1910, flags, setts, and curbs, from Haslingden, Rawtenstall, Bacup, etc.; cast-iron manhole covers and street grids and other castings; earthenware gullies and silt traps and stoneware and earthenware pipes, etc., for the corporation. Particulars and tender forms at office of J. T. Earnshaw, A.M.I.C.E., borough surveyor. Tenders by noon, on Feb. 25, to J. Neal, borough comptroller, town hall.

March 1. RICHMOND (SURREY).—Demolition of buildings known as Castlegate, Lower Mortlake Road, Richmond, and removal of the materials with some exceptions. Contractor to state terms upon which he is prepared to purchase. Tenders to E. J. Partridge, surveyor, Bank Chambers, Richmond, by March 1.

March 1. LEEDS.—Supply the following during the ensuing twelve months, for the corporation:—Builders' materials, timber, ironmongery, plumbers' materials, glass, and paint. Copies of the schedules and forms of tender of W. T. Lancashire, Municipal Buildings, Leeds. Tenders to the town clerk, town hall, Leeds, by 10 a.m., on March 1.

March 2. EASTON AND NORMANBY.—Supplying about 1,200 yards of asphalting to be done in the cemetery, for the burial board. Specification at the board's office in the cemetery. Tenders by March 2, to Rob. Franks, clerk to the board, Normanby.

March 4. HUDDERSFIELD.—Supply and delivery of the following materials, for year ending March 31, 1910, for the corporation:—1. Granite setts, gritstone setts and macadam; 2, furnace slag, broken and unbroken, for highway purposes; 3, flags, landings, kerbing, etc.; 4, pitch and creosote oil; 5, cast-iron materials; 6, Portland cement; 7, bricks, lime and river sand; 8, hay, straw, and provender; 9, scavenging machine, brushes and brooms; 10, earthenware pipes, junctions, bends, etc.; 11, house coal; 12, team work; 13, shoeing horses; 14, engine oil. Specifications and forms of tender of K. F. Campbell, M.Inst.C.E., M.I.C.E., borough engineer and surveyor, 1, Peel Street. Number of tender form to be stated. Tenders, endorsed, as the case may be, by 10 a.m., on March 4, to J. Henry Field, town clerk, town hall, Huddersfield.

March 8. EASTBOURNE.—Supplying for the corporation Portland cement, cast-iron goods, wrought iron goods, tools, etc., ironmongery (miscellaneous), oils and colours, timber, broken granite, granite kerb and setts, bricks, pipes, ju[illegible]s, etc. (stoneware), brooms, brush[illegible] etc. Specifications and forms of tender at borough surveyor's office, town hall. Tenders by noon, on March 8, to A. Ernest Pr[illegible]tt, borough surveyor.

March 19. SUT[illegible] COLDFIELD.—Supplying following [illegible]terials during year ending March 31, 19[illegible]0, for the corporation:—Granite macadam kerb, limestone macadam and setts, gravel and broken pebble stones, Yorkshire or Pennant kerb, Rowley setts, earthenware pipes, cement and lime, iron castings, iron and steel, timber, hardware, oils and paint, bass brooms. Conditions of contract and form[illegible] of tender of W. A. H. Clarry, A.M.Ins[illegible]., borough surveyor, council house, [illegible] Coldfield. Tenders by March 19, end[illegible] Tender for Materials."

THE

Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
30, Cross Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ADVERTISER (28), seeks re-engagement, ten years' thorough practical knowledge of building, estate management, and repairs, etc.; experienced in preparing plans and estimates, including quantities, for new works: highest refs. — Y., 86, Coniston Road, Muswell Hill, N. 4805

ADVERTISER (27), Architect and Surveyor, recently returned from Sudan, after completing engagement, desires position as architect or manager to building estate.—Baratt, Hollyrood House, Gravelly Hill, North, Birmingham. 4842

ARCHITECT'S Assistant desires engagement, finalist R.I.B.A.; design, details, specifications, 1st class honours, quantity surveying, honours (Part 1), building construction, artistic and practical; moderate salary.—Address Architect, 24, Brunswick Street, C.-on-M., Manchester. 4871

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. 4828

ARCHITECT'S Assistant (23), excellent Draughtsman, desires re-engagement; London preferred; six years' first-class experience town and country work; contract, detail, and competition drawings; exhibitor Royal Academy; Prizeman for Architectural Design; small salary.—F. E., 10, Cobham Road, Kingston-on-Thames. 4876

ARCHITECT'S Assistant (23), desires engagement; 7 years' eaxperience.—Sedgwick, Belvedere Road, Sunderland.

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECT'S Assistant (23), late pupil, seven years' all-round experience, been clerk of works, working drawings, details, etc., knowledge of quantities and perspective.—E. P. Lee, 631, Commercial Road, London, E. 4781

ARCHITECTS, builders, estate agents (19), good energetic draughtsman, tracing, colouring, working drawings, etc.; willing to assist in office work; references.—F. J. Williams, 89, Shrubland Street, Leamington Spa, Warwickshire. 4796

ARCHITECT'S good all-round Assistant; 10 yrs.' exp. North, South, and Wales; quans., details, working drawings; mod. salary.—W. T., 14, Stanhope Road, Stockton-on-Tees. 4798

ARCHITECT'S assistant (23), over 7 years' London and Provincial experience; excellent references; Inter.R.I.B.A. Exam. — H. J. Wilson, "Brinkdale," Park Road, Peterborough. 4670

ARCHITECT and Surveyor's Assistant (21), seeks re-engagement; 5 years' experience in church and domestic work in larger provincial office; good draughtsman and colourist.—Box 4823, Builders' Journal Office.

ARCHITECT'S Junior Assistant (19), 4 years experience in West End Office, working drawings, details, perspectives, competitions, excellent references; salary 21s.—Box 4777, Builders' Journal Office.

ARCHITECT'S and Surveyor's Assistant, 15 years' good practical experience; excellent draughtsman, designer and colourist; working drawings, details, specifications, surveying, levelling and general routine; excellent references; moderate salary.—A. R., 1, Ivy Villas, Cheam, Surrey. 4862

ARCHITECT'S, Surveyor's or Builder's Assistant (23), Inter.R.I.B.A., good draughtsman, levelling, surveying, specifications, assist quantities, supervision, estate work, correspondence, accounts; excellent references; moderate salary.—H. O'R., 80, Lavender Sweep, Clapham, S.W. 4810

ARCHITECT'S Assistant, thoroughly experienced, temporary employment; domestic work, business premises, schools, etc.; surveying and levelling, etc.; two years' experience in Structural Engineer's office; salary moderate. — Box 4820, Builders' Journal Office.

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

ARCHITECT, estate agent, or builder's assistant, experienced in all branches; good references.—R. S., Eagle House, Marine Parade, Clacton-on-Sea. 4816

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, Builders' Journal Office.

ASSISTANT Draughtsman disengaged, student R.I.B.A.; prizeman in classic and mechanics, A.A.; good all-round London experience; salary 20s.—148, Shooter's Hill Road, S.E. 4864

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

BUILDERS' Assistant desires situation; thorough knowledge plans, specifications, quantities, measuring; not afraid of work; salary not so much an object as permanent situation; 21; 5 years' experience.—Box 4839, Builders' Journal Office.

BUILDER'S Assistant or Manager; thoroughly efficient; moderate salary if prospect of hard work and exceptional ability being recognised; 23 years' experience.—Alpha, 191, Park Crescent, Grimsby. 4877

BUILDERS', Surveyors' Assistant (24), capable and reliable, seeks re-engagement, thorough practical knowledge of construction, surveying, measuring up, good draughtsman, supervision, also costs, accounts, wages, etc.; mod. sal.—Box 4841, Builders' Journal Office.

BUILDERS' Assistant desires work; plans, estimates, setting out buildings, measuring up, prime costing, surveying, and levelling plots, ordering exact quantities, materials; 11 years' experience.—Box 4803, Builders' Journal Office.

BUILDER'S or Architect's Junior Assistant (18), good tracer, well up in prime cost, and general office work; excellent references; three years' experience. — J. W., 164, Wellesley Road, Ilford, Essex. 4833

CARPENTER, or Handy Man, tall; age 34; take charge on large jobs, wants work; 7 years' good reference; moderate salary.—H.C., Box 4838, Builders' Journal Office.

CLERK of Works seeks re-engagement; just finishing public building; varied experience, notably ferro-concrete construction; well recommended; testimonials most excellent; age 45.—A. B., Box 4814, Builders' Journal Office

CONTRACTOR'S outdoor manager and surveyor desires engagement; present situation 17 years; age 37; keen on variations; expert in measurements; all trades, quantities, estimating; town or country.—W., 2, Dalberg Road, Brixton. 4776

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.

ENGINEER, general, wants permanent appointment, official or private staff; **thorough all-round** experience; electrical, **plumbing, smith, married,** 34; good **testimonials.—86, Bathurst Gardens, Willesden. 4704**

ESTATE Owners.—Bricklayer, all-round, stonewaller, and general repairs; abstainer; good references; moderate wage for permanency.—Quinton, 12, Holland Road, Aston, Birmingham. 4802

FIREPROOF Engineers and Concrete Specialists. Advertiser, connected with above trades for 10 years, and whose name is well known in connection with same, desires position as manager, traveller, or head clerk; first-class book-keeper; aged 33; very moderate salary.—P. W. Potter, 73, Penshurst Road, Thornton Heath. 4719

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, Builders' Journal Office.

FOREMAN Painter (working) seeks re-engagement); experienced in all class work in building trade, as for general alterations, etc.; good supervisor, and reliable; either town or country; abstainer.—X. Y. Z., 8, Barton Street, Westminster. 4807

GENERAL Foreman seeks re-engagement, thoroughly practical in all branches; trade, carpenter and joiner, good draughtsman, first class references; town or country.—**A. J., 196, Murchison Road, Leyton.** 4804

GENERAL Foreman seeks re-engagement; alterations or new, practical experience in all branches; carpenter and joiner; good references; age 36; moderate wages.—Caplen, 3, Victoria Mansion, Edgware Road, Paddington, W. 4779

GENERAL Foreman seeks re-engagement, thoroughly practical and reliable; new or alterations; carpenter and joiner; life abstainer; first-class references.—Foreman, 3, Hawbridge Road, Leytonstone. 4787

GENERAL or builder's foreman, energetic, reliable, good timekeeper, trade bricklayer; age 32. Good refs.—G. C., 44, Richmond Park Road, Kingston-on-Thames. 4863

JUNIOR Assistant desires situation, home . abroad; good practical knowledge of construction and details; competent draughtsman and colourist, working drawings, measuring and supervising, surveying and levelling; moderate **salary.—Box 4613, Builders' Journal Office.**

MACHINIST seeks situation; spindle fourcutter, etc.; married, age 32; total abstainer and good timekeeper.—Machinist, 46, Priory Street, Tonbridge, Kent. 4874

PAINTING, paperhanging, distempering, graining wanted, piecework, new work at greatly reduced prices; specimen showing architects' and surveyors' testimonials for quality and cheapness.—Galton, 6, Parolles Road, Upper Holloway, N. 4861

PLASTERER, good jobbing bricklayer, roofs, fire work, stoves, tiling, etc., etc., generally useful, good reference, moderate wages, non-union.—A. Trigg, 117, St. John's Hill, Clapham Junction, S.W. 4856

QUANTITY Surveyor's Assistant (21), 4 years' experience, desires engagement, certificates and good references. — Apply Box 4745, Builders' Journal Office.

QUANTITY, General Surveyor's Junior Assistant, four years' experience; working up measuring existing buildings, good draughtsmen, little estate work; City Poly student.—J. R. O., 233, Essex Road, N. 4844

SHOP-FITTING, advertiser (38), well up in all branches of air-tight work, seeks situation as foreman in shop-fitting or joinery works; 9 successive years' with present employer.—Apply, Box 4837, Builders' Journal Office.

SURVEYOR'S Assistant seeks re-engagement, 9 years with City firm; highest references; surveys; levels, estate management, etc.; shorthand and typewriting, if necessary. — J. P. K., 21, First Avenue, Manor Park, Essex. 4873

TO Estate Owners, builder, experience, in all trades, desires position as manager (working or otherwise); plans prepared, quantities, setting out, accounts and supervision; abstainer; country preferred.—Box 4806, Builders' Journal Office.

VOLONTAIRE.—Foreign gentleman (21) desires position in builder's office, with opportunity of learning.—B. B., 43, Bolingbroke Grove, Wandsworth Common, S.W. 4789

YOUNG Gentleman, with good business pushing qualities, wants situation, experienced buyer in quick selling lines; timber, matchings, joinery, mouldings, etc.; building materials, ironmongery, oils, colours, glass, garden requisites, practical experience, good references; will manage small cash business and develope it. — Box 4872, Builders' Journal Office.

Appointments Vacant.

ARTICLED Pupil, vacancy for same in an old-established architect's and quantity surveyor's office, on the South coast; trained under principals; moderate premium; part returned. A typewriter will receive greater consideration.—Apply Box 4822, Builders' Journal Office.

PARTNERSHIP.—Builder and contractor (established), employing workmen for all trades, at present engaged in developing the town council's new estate in an important and flourishing seaside resort on East Coast, requires experienced young man (some capital necessary), for a partner.—Apply first (in confidence) with particulars to Box 4870, Builders' Journal Office.

WANTED, travellers with established connections at present representing other houses, for the sale of Duroline, a transparent and unbreakable glazing material, to supersede glass for lighting factories, workshops, etc., and other roofing specialities. For terms and particulars apply The Duroline Wire Wove Roofing Co., Ltd., Imperial Road, Fulham, S.W. 4865

WANTED, traveller, floor, wall and hearth tiles; London and suburbs.—Apply Manager, Malkin Tile Works Co., Ltd., 65, Charing Cross Road, London. 4869

March 3, 1909.
Volume 29. No. 9.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: The R.I.B.A. Board of Examiners; The Press, Lay and Technical; Brighter Prospects, 175; Housing Exhibitions; Sanitation, 176.
The Marble Arch Royal Gates - - - - 176
The Press and Architecture - - - - - - 177
The Influence of Tools on Woodwork Design - 180
Notes on Competitions - - - - - - - 180
Our Plate - - - - - - - - - - 181
Obituary - - - - - - - - - - 181
House at New Malden, Surrey - - - - - 181
Correspondence - - - - - - - - 181
London Master Builders' Association: Annual Dinner - - - - - - - - - - 181
Enquiries Answered - - - - - - - 182

CONCRETE AND STEEL SECTION.

American Civil Engineers' Report on Reinforced Concrete - - - - - - - 185
Wheels of Reinforced Concrete - - - - 185
A Reinforced Concrete Aqueduct. By Robert S. Walker - - - - - - - - - 186
A London Steel Frame Building - - - - 187
The Construction of the Selfridge Store - - 188
The Concrete Institute: The Commercial Aspect of Reinforced Concrete. By Lucien Serraillier - - - - - - - - - 191
Selfridge Stores, Oxford Street, London - - 192
Methods of Attaching Shafting and Machinery in Reinforced Concrete Buildings - 195, 196
Federation News - - - - - - - - 197
Employers and the House of Lords - - - 198
Proposed New Works - - - - - - - 198
Trade and Craft: Holt's Patent Syphon Cistern 198
Tenders - - - - - - - - - vi., viii.
Complete List of Contracts Open xxv., xxvi., xxvii.

ILLUSTRATIONS.

Proposed Residence, Hendon Lane. Walter Bennett, M.S.A., and Frank E. Stratton, A.R.I.B.A., Architects, 177 and Centre Plate.
House, Selwyn Road, New Malden, Surrey. Harold Kemp, Architect - - - - 179, 180
Arranging Double-hung Sashes - - - - 183
Strength of Wall - - - - - - - - 184
Calorifers - - - - - - - - - 184
A Reinforced Concrete Aqueduct: Cross Section of Aqueduct, 186; View of Forms for Wing Walls, 186; Section of Beams in Canal Bottom, 186; New Aqueduct Complete, 187; View of Forms for Berm Path Slab and Supporting Beam, showing Canal Side partly Completed, 187.
Selfridge's Stores, Oxford Street: Steelwork Plan, Second Floor, 188, 189; Portion of Grillage Foundation Plan, 190; Section through Retaining Wall, 191.
Methods of Attaching Shafting and Machinery in Reinforced Concrete Buildings - - - 195
Holt's Patent Syphon Cistern - - - - - 198

The R.I.BA. Board of Examiners.

The policy of the Board of Examiners in admitting, year after year, an inordinate number of imperfectly educated youths to swell further the ranks of an already terribly congested profession is, to say the least, open to criticism, and, for many reasons, it appears to us to be one to be deprecated and deplored. Indeed, we do not hesitate to predict that active steps will have to be taken, and that soon, to prevent the continuance of an ill-advised system which there is little doubt is reacting disastrously upon the welfare of all properly qualified architects. A glance at the constitution of the body officially responsible for the selection and (rejection) of the aspirant to an artistic career does not encourage the belief that it is adequate to the efficient discharge of the delicate duties imposed upon it. We have no desire either to wound the susceptibilities or to belittle the services of the many estimable members of the profession who, with the best intentions in the world, have devoted much care and attention to the work of the Board of Examiners. But, nevertheless, we feel compelled to say that we should like to see the *art* of architecture more adequately represented on that body. It is perfectly obvious that the "surveying" element is far too largely represented on the Board. Much more could be said on this subject; but for the present we refrain from closer analysis, as we desire to deal with principles rather than with persons. We must add, however, that, in our judgment, *all* examinations for architects should be conducted *solely* by the most scholarly and artistic men the profession can produce. Yet, probably, of the forty-four members constituting the Board, barely more than half the number would be found to pass satisfactorily this admittedly somewhat exacting test. We suggest that the soon the custom of enlisting *outside* assistance in the preparation of papers set in the preliminary examination is abandoned the better it will be for the success of the examination. What is wanted (in substitution for the present test of "general culture" now carefully adjusted to the standard of a Board School education) is an *informal* inquiry, conducted by properly educated and cultured men, into the candidate's antecedents and education,—the extent and scope of his general reading, and his knowledge and appreciation of the literature, art, and science of his own and other countries. In short, a preliminary examination should be instituted, such as that sometimes imposed by heads of colleges at our older Universities, prior to the admission of candidates to residence within the ancient foundations of the more popular of these schools of learning. A test of the kind we have indicated, is a veritable examination in "general culture" which (*pace* the Board of Examiners) the present preliminary examination does not supply, even though the ordeal to be faced by the candidates under its existing regulations includes investigations regarding the embryo architect's knowledge of "English Composition," "Writing from Dictation," and "Arithmetic, Algebra, and the elements of Plane Geometry."

The Press, Lay and Technical.

Mr. Needham Wilson's somewhat caustic review of the general attitude of the lay Press towards architecture, in his clever paper read to members of the Architectural Association expressly excludes the professional Press, to whose merits he pays a generous and gratifying tribute. The architect is, of course, a "reading man," a discerning critic trained in the nice judgment of "values," and his appreciation is therefore as the "praise from Sir Hubert Stanley." We make our bow to Mr. Needham Wilson. The expression, "professional Press," however, is perhaps not quite sufficiently comprehensive. The organ that an architect finds most interesting and useful deals with every aspect of building. It is, therefore, industrial and commercial, as well as professional. Perhaps "technical" would be a more inclusive term. But the point is of merely academical interest. What is of real practical importance is that the well-conducted technical journal aims at being a sort of central exchange by means of which the architect, the contractor, the merchant, the specialist, and even the craftsman, are put into profitable communication with each other. Each wants to know what all the others are doing, and the up-to-date journal tells him, promptly and definitely; and it should be of about equal value to the representatives of all these interests. That the reading habit, to which architects need no incitement, is spreading rapidly, and is already widely diffused, among other denominations of builders, we are in possession of the most gratifying evidence. The National Federation of Building Trade Employers have realised that their members needed a medium of intercommunication that should not only record their own transactions, but should keep them well abreast of the times by showing them everything of importance that is being done in other directions—the latest developments in ideals, methods, and materials, at home and abroad. That they have found in this journal an eminently satisfactory medium for the dissemination of such useful and interesting information is evident from the cordiality with which its name is always received at association meetings. The discriminating eulogies of the journal by speakers at these meetings prove that the complete builder, like the complete architect, is fully aware that, in order to maintain his claim to that proud title, regular and attentive perusal of an up-to-date technical journal is a primary essential.

Brighter Prospects.

Although it cannot be said that, for the moment, trade is actually and palpably better than it has been for many weary months—one might almost say years—it is nevertheless gratifying to note everywhere a sudden and very marked increase in optimism. "True hope is swift, and flies with swallow's wings." This welcome accession of courage and cheerfulness may be either the cause or the consequence of improved conditions. Perhaps it is both. To anticipate either failure or success is to court the one or the other; and whether or not the more hopeful tone with which architects and builders have rather suddenly become inspired is due to observed indications, or even to some subtle and inexplicable sense that things are about to take a turn for the better, it is very certain that concerted hopefulness must, of its own inherent force and influence, tend towards materialisation. On the other hand, those who (to use an expressive colloquialism) are "looking for trouble" seldom fail to find it. The present depression seems to have been largely a matter of human feeling, or incompetency, or distraction. The world's wealth has not been sensibly diminished by plague, pestilence, famine, or other great convulsion beyond human control. It is all a matter of administration, adjustment, distribution. Things had got into a seemingly hopeless tangle. Energy and enterprise seem to have been taking a rest, and should now arise strengthened and refreshed by the long period of recuperation. The greater buoyancy and confidence that are becoming manifest have in some directions taken tangible shape. For example, we read, with regard to the property market, that "Transactions of all kinds, at the Mart, in the country and suburban sale-rooms, and by private treaty, notified to the Estate Exchange this year, show a decided improvement in comparison with those in the like period of

1908, being £385,855, against £294,121." Then, improved prospects for the building trade in London are freely prognosticated. The new wing to the British Museum, upon which preliminary operations are in progress, should make builders the richer by £450,000. The Bedford estate is being developed, and a new thoroughfare from Torrington Square to Montague Place, opposite the main entrance of the Museum extension, is bringing grist to the mill; and other important works in hand are the extension wing of the National Gallery, the Admiralty extension in Spring Gardens, the new offices in Whitehall for the Commissioners of Woods and Forests, and the preliminary work for the new London County Council Hall in Belvedere Road; while new military recruiting offices are to be built in Great Scotland Yard. In the country, the boom in secondary schools and "places of higher education" is likely to increase rather than to abate; and now that foreign manufacturers are feeling the effects of the new Patents Act, they are making haste to have factories erected in this country. Altogether, there would seem to be fair warrant for the more optimistic outlook that is beginning to prevail. At all events, it is wise and helpful to cultivate hopefulness, and to shun pessimism as if it were a pestilence. The lamentations and the speculative adventures of Jeremiah ("Jerry" for short) are of particularly bad augury for the trade, and it is delightful to find that they are being generally discredited and discarded.

Housing Exhibitions.

Almost simultaneously with the announcement that a rather heavy call on the guarantors has been found necessary in connection with the housing exhibition at Walker-on-Tyne, it is stated that the work of preparing the site for the South Wales Housing Exhibition, to be held at Swansea this summer, is being pushed forward as rapidly as possible. *Absit omen!* "Swansea may succeed where Walker has, in a manner of speaking, failed." But it may be presumed that, in an exhibition that is primarily intended to be educative, commercial success is a matter of quite subsidiary importance, and the guarantors were probably prepared to suffer in a good cause. When housing exhibitions began, widespread interest was aroused in the knotty problem of cheapness. Could small houses be built well and substantially at the low rates specified in the scheme of classification? That was the question; and now that it has been answered—not emphatically in the affirmative—curiosity has subsided. Successive exhibitions have been remarkable for their sameness, and their consequent tameness; the local variations being so insignificant from the general point of view as to fail to attract from a distance anybody outside the ranks of enthusiastic housing reformers, professional and amateur. But while results have been, so far, somewhat disappointing, there can be no doubt that such exhibitions stimulate, in a greater or minor degree, the art and the trade of the districts in which they are held; and the alert professional man or tradesman may find, even in the least successful of them, something to note and remember—some example to imitate or to avoid. They represent movement of some sort, even if it be but motion without progress; and that, at all events, is better than stagnation. Housing exhibitions, however, hardly escape the condemnation that was meted out the other day in a "Times" leader dealing with building regulations. "Sets of them are drawn up for urban and rural districts by people who have an abstract conception of what houses ought to be. When these come to be applied to the erection of agricultural cottages in a particular locality, the beautiful result is that cottage building comes to an end. Cottages built according to regulations are too expensive for the people they are meant to house, or they are not the sort of cottage that the people like, and the population does not change its ancient habits just to suit the doctrinaire. It is quite possible to build good comfortable cottages suited to the district and within the means of poor people, but no one can do that without being exposed to legal proceedings. The doctrinaire wants to plant men upon the soil—an admirable expression, for he evidently thinks that a man can be planted as easily as a cabbage." Because the cheapest dwellings at housing exhibitions are usually required to comply with the "doctrinaire" regulations of the district, they necessarily become too expensive to be accepted as models of practical utility. The danger of relaxing those regulations, however, though ignored by the "Times" writer, is only too obvious. The so-called "doctrinaire" is not to be flouted and despised. He has initiated many valuable and priceless hygienic reforms. That he is given to running to extremes is no more than can be said of his opposite, the so-called utilitarian, who is too apt to fetch up in unmitigated slumdom. What is wanted is some fair middle course between these extremists. Perhaps the Swansea exhibition may show how we can arrive at it. If it does, it will deserve to be called epoch-making. A fresh experiment that is about to be tried by the London County Council on its Norbury estate touches the rent question. The Council is putting up ninety-five cottages on this estate. It was at first proposed that these cottages should uniformly consist of five rooms each; but it has now been decided that twenty-six shall contain four rooms each, and that half-a-dozen shall consist of three rooms and a box-room, so as to come within the means of "heads of families earning from 25s. to 30s. a week." It is pitiful that "heads of families," and the London County Council, should be driven to such shifts.

Sanitation.

Sanitary inspectors are fond of saying that the first sanitary reformer was Moses. Mr. P. M. Raskin, of Leeds, who read an interesting paper at a general meeting of the North-East Centre of the Sanitary Inspectors' Association the other day, did not repeat this platitude in so many words, but his title seems to imply it, for his paper was headed, "The Mosaic Sanitary Code and its Relation to Modern Sanitation." The Mosaic laws with regard to sanitation were chiefly directed towards the scourge of leprosy, and they were very drastic. Infected clothing was to be burnt, an infected house had to be emptied, the infected parts of the building removed, and the walls scraped. If the malady recurred, the whole house had to be demolished, and the materials removed to an unclean place outside the camp, and never used again. Mr. Pridgin Teale, who presided at the meeting at which Mr. Raskin's paper was read, remarked that nearly every one of the greatest cities of antiquity having disappeared, he thought it probable that such places as Babylon and Nineveh had been abandoned because they had grown beyond the power of the people to keep them sanitary. This is not a very far-fetched theory, and perhaps Mr. Teale does not claim originality for it. The Great Plagues and Black Deaths of more modern cities have doubtless been due to the same cause; and modern immunity to such visitations is entirely due to the advance of sanitary science. Abandonment of insalubrious districts is a practice that is much older than civilisation. The civilised method of removing the refuse from the dwelling is reversed by savages. They simply remove the dwelling from the refuse.

THE MARBLE ARCH ROYAL GATES.

The uncovering of the Marble Arch Royal Gates, the erection of which, it will be remembered, was commenced on November 9th last, the King's birthday, occurred on the day of the opening of Parliament by the King. The Royal gates, and others that have been erected on either side of them for the public use, practically complete Mr. F. W. Speaight's improvement. The design for the gates was made by the Office of Works, and the gates, which were made by Messrs. Martyn, of Cheltenham, are generally admitted to be one of the finest specimens of hammered iron work in London. They are all of wrought iron, executed in a free treatment, most of the ornament being generally associated with the Royal emblems. The centre of the Royal gates is 18ft. high and 16ft. wide between the piers. The main feature of the ornaments on these gates is the Royal Arms surrounded with the chain of the Order of the Garter, and surmounted by a crown from which a festoon of laurel leaves is suspended. The many hundreds of pieces were fused together by the aid of oxygen gas and acetylene. From the chain hangs the emblem of St. George and the Dragon, while in a lower portion of the gates the centre is fitted with the Tudor rose. This ornament is repeated four times, being on either side of each leaf to the pair of gates. The gates are so constructed as to open freely, without the usual track and rollers, on which horses are apt to stumble. On each side of the Royal gates are two railing panels, 12ft. high and 11ft. wide, the centre of the upper portion being a large Tudor rose upon a convex surface surrounded with acanthus leaf ornament and surmounted by a Royal crown. The lower portion is treated with foliaged scroll-work. There are upwards of ten thousand hammered iron laurel and palm leaves used in the whole design.

Following the railing above mentioned on either side are a double pair of carriage gates, each pair being divided by a large box pier, or rather a treble box pier, while beyond the carriage gates are the foot gates. The ornamentation of the carriage gates is again different from that of the Royal gates and railing, the design being composed of the Royal cypher upon a convex shield surrounded with wreaths of laurel leaves tied with ribbons from the bows of which spring sprays of palms, the whole being again surmounted with a crown. The over-all width of the carriage gates measures 32ft., and the height of the centre pier 13ft. The foot gates are treated in a similar way, and are 12ft. 6ins. wide, the height being the same as that of the carriage gates.

On the west corner of the new road there will be erected shortly further gates of similar importance and design to the carriage gates, also one pair of foot gates of simpler design, being somewhat similar to the panelled railings on each side of the Royal gates. On the south-west corner a pair of foot gates are also being erected, to give greater facility at the inner portion of the new road. These also are comparatively simple.

The total cost of these iron gates, etc., has been about £3,000, and they have given employment to some seventy or eighty craftsmen, for over three months. The weight of the combined gates is nearly 40 tons. All the materials that are being used for the work, as well as the labour, are British.

THE PRESS & ARCHITECTURE*

The Awakening.

Lately we have witnessed a vast change in the attitude of the Press to our profession and its productions. The moment is fraught with big events for architecture, in this awakening of the powerful English Press.

In Praise of the Professional Press.

The author did not include the professional Press in his remarks. Architects, in his opinion, cannot over-rate the debt of gratitude owed to the professional Press, which has done so much to promote the best interests of our art, to foster its appreciation, and to advance its progress in the best channels. It would, he said, be ungracious not to pause to acknowledge the help and assistance which the Association had received from the professional Press, and all those connected with it, from the editors to those gentlemen who report what are only too frequently, he feared, dull, lame, and halting speeches in that room. We have little to complain of in our professional Press, which, indeed, did not come within the scope of his paper.

How to Acquire Fame—Cheap.

The daily Press has a tendency to rush from indifference to the other extreme, and thereby offer a temptation to the young and struggling man to make a desperate attempt to escape from the trammels of obscurity, and to launch himself on a career of fame. The process is simple. Hatch up a wild-cat scheme, preferably connected with a public building, dish it up in as splashy a drawing as you can, and send it to the—well, a daily paper. Do you think a dome would look well on Westminster Abbey? Send it to the Press. Why not rebuild the Bank of England as a skyscraper? Send it to the daily Press. Cover in Trafalgar Square with steel and glass—send it to the daily Press. Cannot you find a site for an unnecessary public building? Then put it on an artificial island in the river and send it to the Press.

Crazes and Scares.

This suddenly awakened zeal in architecture has taken another strange phase of recent years, partly accentuated by the Garden City and cheap-cottage craze, and such incidents as the settlements in St. Paul's Cathedral. So much public attention was drawn to these matters, that the reading public realised for the first time that there existed a class of individuals known as architects, and the doubtful privilege of the "interview" was extended to members of the profession.

Discovering the Finest Building in London.

Then there was an endeavour, in one of the evening papers, to discover the finest building in London. The result must have been somewhat bewildering to the reading public if they read the opinions at all. And if they came to any conclusion it must have been one of contempt. Still, the attempt was, on the whole, commendable, as it probably led many to realise for the first time that fine buildings did actually exist in London. This is something achieved by the Press, though whether as a result architecture has been advanced is open to question, and for architects there seems only a step between this kind of thing and the advertisement columns.

This

Tardy Recognition of the Architect

by the Press is but a bare act of justice long delayed, and in its inception naturally ill-expressed. Hitherto he has been consistently ignored. The painter who executes in pigments the creation of his brain, and the sculptor who puts in concrete form his fancies, are recognised as the authors of their creations, and are open to adulation or criticism according to the fad of the moment. Indeed, a Press warfare may rage around their work if the Press, that stern guardian of public morals, decrees so.

Delicate Details.

Editors of the lay Press appear to consider that the public are chiefly interested in the exact number of bricks used, or the precise quantity of cement employed, or the number of men engaged, and how many were killed or injured, and how many gallons of beer they drank. They hardly go far enough. Why do they not add the age of the contractor, a brief family history of the quantity surveyor, the weight of the clerk of works, and such interesting details? Why does it not occur to these editors to give the number of drawings made, the aggregate of hours spent upon them, and the quantity of pencils used? Why not detail the time occupied in party-wall disputes, struggles with innumerable authorities, and other engrossing matters?

The Man, the Method, and the Moment.

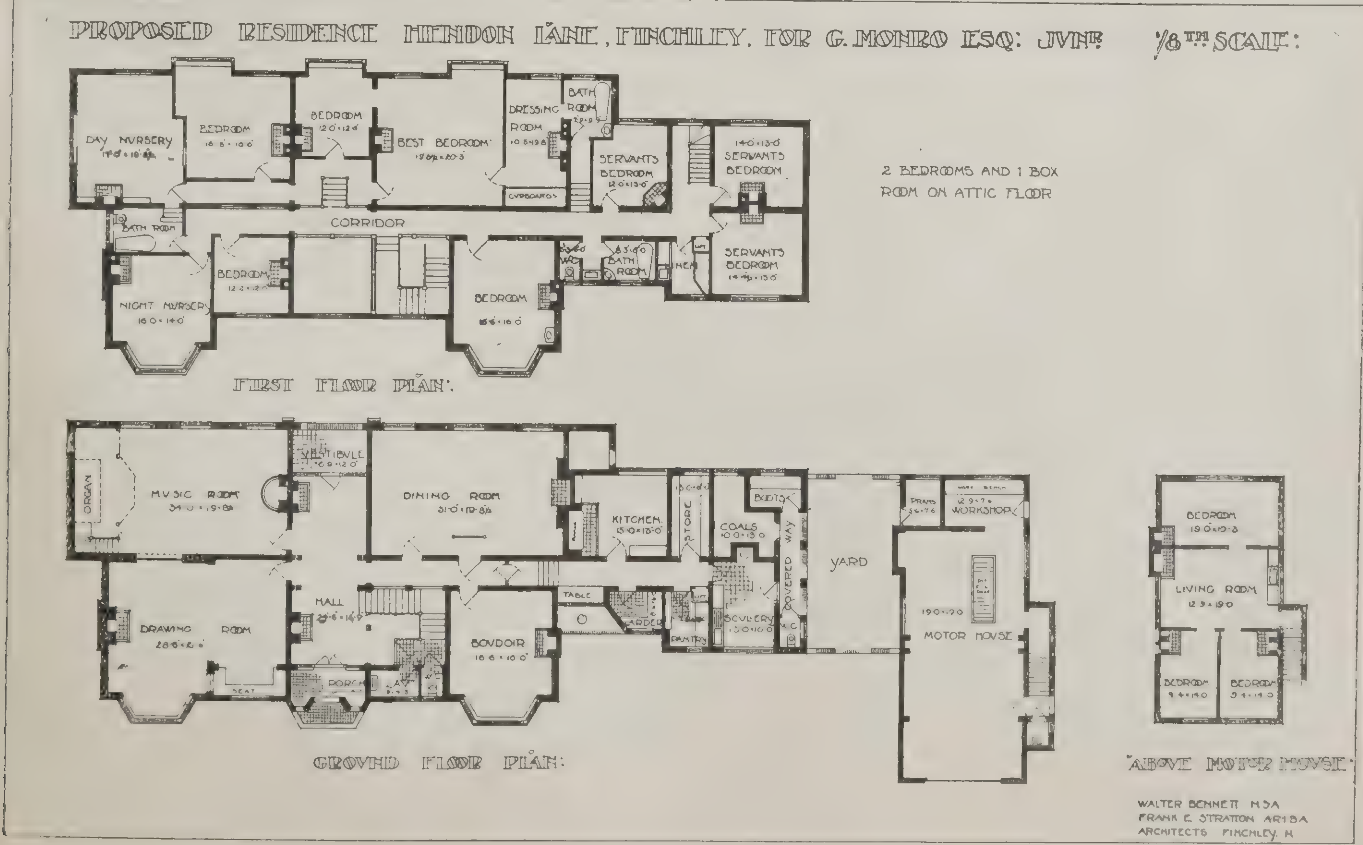
But hitherto no one has been interested either in the method by which a building is produced or in the man who produces it. Now, however, that the public have discovered that a building does not rise spontaneously, and that there is a directing and controlling force known as the architect, there is a tendency to rush to the opposite extreme, and advertise the architect at the expense of the architecture. This tendency has been aggravated by the result of the competition for the County Council Hall, where the picture of a young man, rising suddenly in prominence and fame, appealed strongly to the Press, and through it to the public. But what appealed more strongly still was the remuneration. You all saw it—in heavy leaded type—"A FORTUNE AT THIRTY-TWO!" Such minor points as that the receipts would spread over many years and be subject to heavy deductions for expenses, were absolutely ignored. The impression conveyed was that the successful author had done his work, had received so many thousand pounds, and there his interest ceased. Apparently not one of the papers took pains to present the facts of the case, and how many presented a serious and authoritative criticism of the designs? Still, there is the salient fact that the architect has been discovered and has received a certain amount of recognition.

Architect Anonymous.

How different from the time when the Imperial Institute was opened amid circumstances of unusual public interest, and extreme pomp and ceremony. The papers were full of it, and devoted column after column to the event, but the author could not remember one which even hinted at the existence of an architect. Certainly, views of the building were published, but it is significant that the name of the author should be considered of insufficient interest to demand publication. There is no need to multiply instances. They will occur only too readily. But the promi-

---

*Abstract of paper read by Mr. A. Needham Wilson, before the Architectural Association, on Feb. 19th.



nent fact remains that only recently has it dawned upon Press writers that some man is responsible for a building which attracts public attention.

The architect, after a prolonged period of obscurity, working beneath the surface, so to speak, producing art for art's sake, is just beginning to creep into the light of the Press, and is here and there receiving public recognition in the shape of well-deserved honours. In honouring them, the profession as a whole has been honoured, and in honouring the profession our art has been honoured. This lack of recognition for benefits conferred upon the community has been due to a variety of causes. Partly the indifference and ignorance of the public, partly the lassitude of the profession, and partly the attitude of the Press.

Clumsy Ridicule.

For long years whenever the architect has appeared in the pages of our journals, he has served as a butt for the shafts of somewhat clumsy ridicule. Occasionally I confess the ridicule has been deserved. More often it has not, and the daily Press, taking its cue from the pages of "Punch," has continued a campaign of satire, which I submit has now become pointless and ill-deserved. I do not think as a profession we are more thin-skinned than other professions, or that we are free from foibles, and we do not claim immunity from the cheap sarcasm which passes for wit. What we want, and what we do not get, is intelligent criticism from persons qaulified to criticise. Here, I again submit, we have a genuine grievance against our otherwise excellent Press. On the rare occasions when an architectural article is required, how often is an architect employed to write it?

Not long ago, I was staggered to see in a sober evening journal, and not one of the sensational journals either, this very unfamiliar heading:—

ARCHITECTURE IN THE WEST END.
By An Architect.

and a very good and well-written article it was, to my mind. I make the editor my compliments!

Blessed Ignorance.

Scarcely a newspaper article, description, criticism, or witticism, scarcely a magazine article, scarcely a story or novel, but has contained some glaring solecism or inaccuracy which has excited the derision of the architect. But then the reader does not know in his blessed ignorance, and the architect has left him to wallow in it.

How is it that we never see corrections of architectural inaccuracies? In a novel by an extremely well-known and popular living writer is a description of an invalid's bath-chair being wheeled down the steps of the house by means of planks laid from the *lintel of the door* to the ground. Not one critic seized upon the solecism. Was the author who wrote of the "stone gargoyles which grinned down upon the passers-by *from each stone mullion*" held up to public derision as a person with a little dangerous knowledge? Not at all. Was the lady who wove a novel round one of our English cathedrals, a novel full of gushing and fulsome anachronisms, pulled up for references to cloisters which simply do not exist? Never to my knowledge.

Showers of Blessings.

Almost a worse type of offender is the one who has a nodding acquaintance with technical terms and showers them upon the long-suffering reader as proof positive of his superior knowledge—a blatant assertion of his real ignorance.

I venture to think, however, that this state of things is passing away, and the colossal ignorance hitherto shown will no longer be tolerated by a better educated public. I suggest that the Press is lagging behind and but slowly following the public demand, instead of exercising its true function in leading and developing.

Influence of Environment.

It is not realised how intimately the daily life of the community is associated with the buildings in which it dwells, worships, conducts its business, works, amuses itself, houses its museums, its works of art, its learned societies, its law courts, its vast system of government. The very necessities of life are bound up in the edifices which meet the eye everywhere. The influence of environment upon the development of the community, as affecting not only its health, but its moral welfare, has received but scant attention in the daily Press, though the awakening knowledge of hygienic necessities has developed more interest in the matters of housing. Even now I suggest that so important a subject as this has not received the attention it demands

Beslubbered Slums and Slighted Suburbs.

Plenty has been written about the slums of our big towns and cities. Plenty has been written about our villages, but who has dealt adequately with our suburbs? I do not mean the suburbs with their detached or semi-detached residences nestling amid greenery and trim gardens, but the drab, gloomy, interminable streets of dull and sordid houses—all ground out of the same mill—with little to relieve the monotony of sooty bricks and mortar, save utilitarian lamp-posts and untidy back yards. It is saying too much to assert that if the Press had done its duty these acres of dreary monotony would have been an absolute impossibility?

Housing and Town Planning Reform.

Surely it is a matter of education, and the Press could raise its powerful voice to urge so necessary a reform. Why should our land be blotted and spoilt by ugly towns and villages for lack of the necessary teaching? We architects cannot do it for fear of the accusation of "touting" for work; but the great Press can, and should.

The Press has the power to mould public opinion for good towards the betterment of the community. It has done it before, and now that it has discovered that such beings as architects actually exist, and that there is such a thing as architecture as distinct from building, let it cease from jibing and deal with great issues.

The Human Nature in Architecture.

Now I turn to another phase, which I think has received no attention at all. It is wonderful to me that the Press has been so long in discovering the human nature in architecture—human nature as expressed in every feature, every moulding, every piece of timber, every worked stone. Does not the Press see the history written or unwritten in architecture? Has it not dreamt of the romance wrapped in every ancient building?

An Appeal to the Press.

I disclaim any advocacy of advertisement for architects, merely pleading that since the eyes of the Press and public are opened, the knowledge of the latter may be intelligently guided. I am only desirous that the efforts of the Press should be directed in the right way for the furtherance of an art so intimately associated with the life of the people, and the perfection of which, both artistically and practically, is essential to the well-being of the nation. It is not as if we architects had stood still. We have made great efforts to advance our profession, and, I think, with success, for surely modern architecture never stood on so high a level as it does now. That being so, we can appeal with confidence to the great power of the Press to lead in the further advancement and development of our art in the public interest

---

Discussion.

Mr. Edward Salmon, of the "Saturday Review," proposed a vote of thanks to Mr. Needham Wilson, and said that as a pressman he thought the address had been delivered to the wrong audience. Mr. Wilson had enlarged on the shortcomings of the Press in a way worthy not only of an architect but of a pressman. Had he not been so well acquainted with Mr. Wilson, he should have credited him with an intimate connection with journalism, for he had given away the foibles of that profession generally. The Press had its art and legal critics, but, judging from the lecturer's remarks, it would appear that the Press was well informed on all subjects except architecture. This attitude reminded him of a story told in connection with the late W. E. Gladstone. A Japanese gentleman sought an interview with the great Liberal leader, and discussed many of the problems engaging thought at that time. Shortly after this interview he (the Japanese) met a friend to whom he described his impressions. Mr. Gladstone, he observed, was a greater man than he had previously thought him to be. His knowledge was profound. The only subject with which he appeared to be quite unfamiliar was Japan. It seemed to him (the speaker) that the Press belonged to the same order of erudition. He had noticed that Mr. Wilson had culled all his evidences of ignorance in regard to architecture, not from the daily Press, but from novels. Why should not the novelist utilise the lintel if he so wished? The novelist took unwarrantable liberties with humanity at large, so why should he not do so with architecture? And probably the lintel was introduced with a purpose. Might it not have been in order to upset the bath chair and kill the occupant? Again, the lady novelist had introduced into her cathedral, cloisters, obviously for the purpose of her story; what harm was there in that? He took the paper seriously, however, and felt that something should be done. But between feeling and doing there was a great gulf. A well-known journalist recently had told him that Kingsway was being turned into an architectural monstrosity. He (the speaker) suggested that Mr. Wilson should organise a personally conducted tour in order to point out the shortcomings of Kingsway.

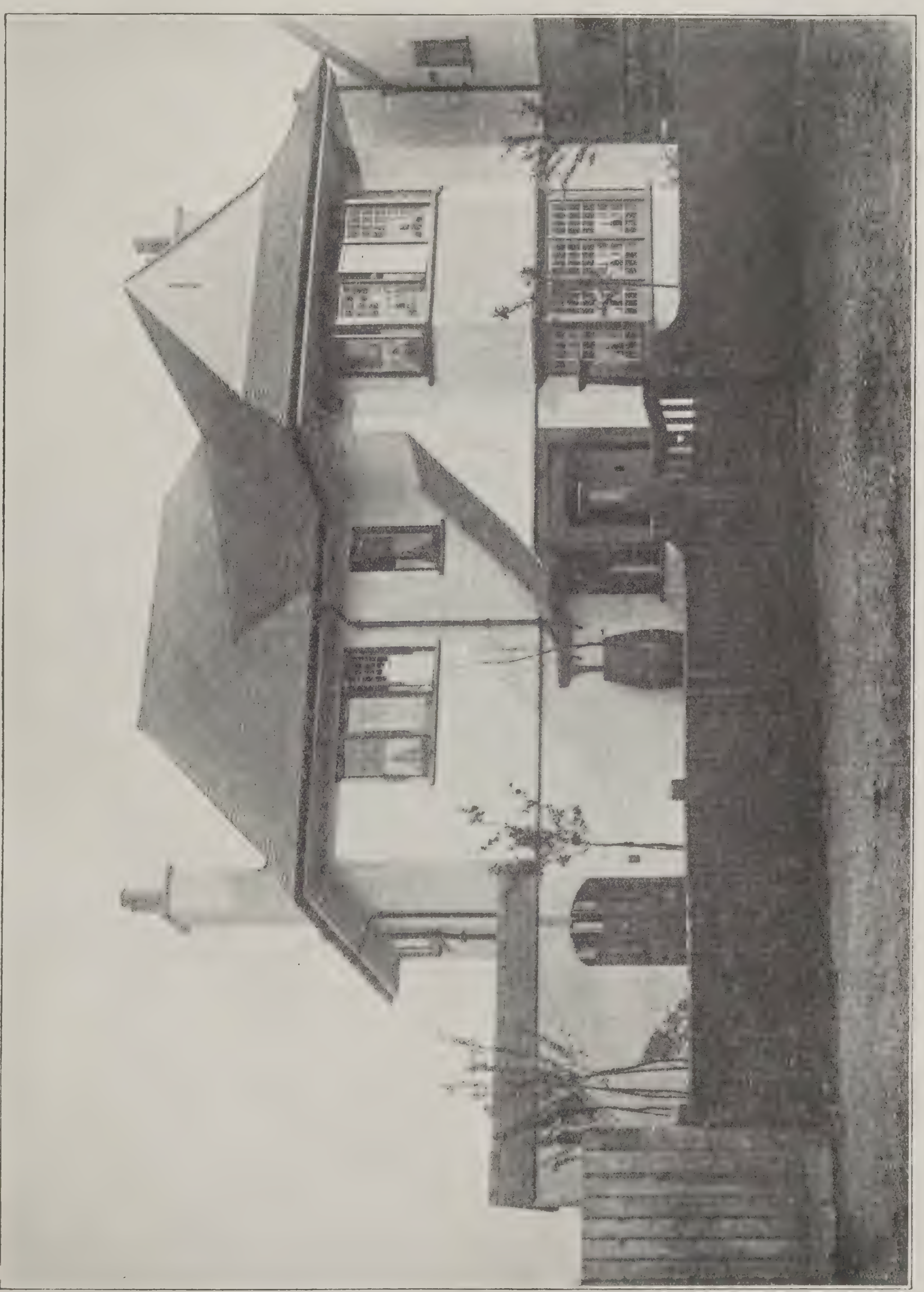
Mr. Louis Ambler, in seconding the vote of thanks, deplored the small audience, but supposed it was due to the fact that the younger members of the association had stayed away, believing the present paper to be of no interest to architecture. He said emphatically it was. It seemed that interest only centred round a building when it was opened by royalty, or when a foundation stone was to be laid by a personage of note. It was then and only then that the architect came into anything like prominence. The provincial Press paid more attention to, and gave fuller descriptions of, buildings in its columns, obviously because the opening of a new building was an unusual event.

Mr. F. D. Clapham said he believed that articles on architecture in the daily Press, however well written, were penned compulsorily in accordance with the editor's instructions. Hence, the public would read with awe that if the bricks employed in the construction were laid end to end, they would form a chain reaching from Land's End to John o' Groat's. "This," they would say, "is a very fine building." He believed that the public hardly knew what to make of the architect. To them he was a sort of glorified plumber, and was the man they would think it right to consult about a leaking tap, and other little questions of that kind.

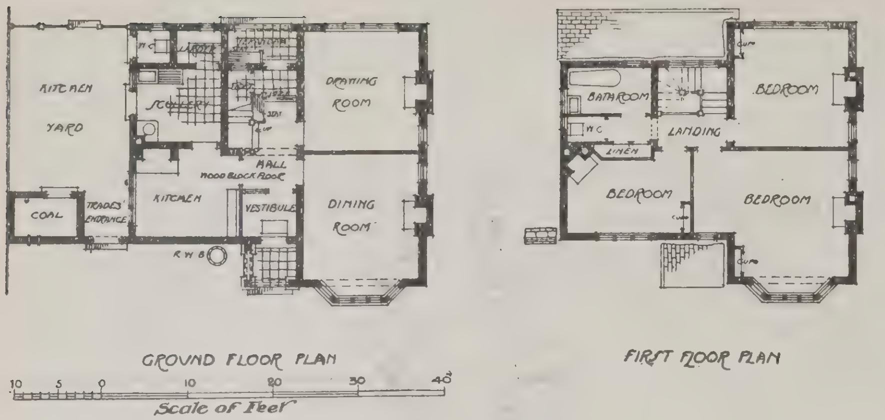
Mr. Alan E. Munby supported the vote of thanks, and recorded his confidence in registration as a possible remedy for the many ills endured by the architect. There were two sides to every question, and the architect should see that he performed his part to satisfaction. A line of distinction should be drawn. At present, a man who made his hen-coops could call himself an architect. The public wanted educating; and it was chiefly due to a lack of this that they were quite unable to judge with discretion, what to dislike and what to appreciate.

Mr. Potter made a few observations, and the chairman, Mr. Henry Tanner, jun. (vice-president) observed that when the lay Press did deal with the subject of architecture, it invariably made egregious errors. He was rather anxious to know what building in Kingsway had been separated out for castigation, as he himself was the architect of one in that thoroughfare.

Mr. Needham Wilson briefly replied



HOUSE AT SELWYN ROAD, NEW MALDEN, SURREY. HAROLD KEMP, ARCHITECT.



HOUSE AT SELWYN ROAD, NEW MALDEN, SURREY. HAROLD KEMP, ARCHITECT.

THE INFLUENCE OF TOOLS ON WOODWORK DESIGN.

The above subject was very ably dealt with by Mr. A. Romney Green, B.A., at Carpenters' Hall, London Wall, E.C., on Wednesday, February 17th, this being the concluding lecture on woodwork, the previous ones having been given by Mr. Guy Dawber, and Mr. Troup, and summarised in this journal. It has always been, he said, a prime instinct of man to have durable goods, as good and beautiful as he can make them, for he is thereby gratifying not only his desire for beautiful things, but his passion for making them, which is a great deal stronger. The richly carved canoes of the New Zealand savages (some examples of which were shown, carved with sharp stones or shells), the sword of the Crusader, the spinning-wheels of the Norwegian peasants, and the public architecture of all great nations, bears witness to this passion. No generation working in this way can produce enough for its needs, but they bequeath more to their successors than they themselves received.

This instinct of man, to make his goods as durable and beautiful as possible, was, Mr. Green pointed out, liable to suffer defeat. However long they took to make their tables, etc., they had to make their tools as well; and some of the most beautiful tables were made with adzes, chisels, and gouges, instead of the elaborate tools with which our furniture is produced to-day. It was the desire to make their work more perfect that led these makers to invent new tools. Some old 14th century pew ends that were shown had been cut out of the solid, and the lecturer pointed out that the cracksand warping consequent on this method suggested the framing of the wood together. This gave rise to the plough, which is a simple adaptation of the chisel. The turning lathe, he said, may have been suggested by the potter's table, and moulding plane was suggested by the plough for cutting mouldings, as accurately and with as little labour as possible. The carving on those old pew ends was done with nothing but the simplest tools. No planes were used, nor even drawing instruments for setting out the ornament; all were freehand, and yet the result was excellent.

An old carved French pulpit of the 16th century showed to advantage the use of simpler tools. In fact, simpler tools were much more frequently used, and a good joiner of that period was well on the way towards becoming a good carver. This pulpit, he remarked, was carried out as a recreation, and almost in a spirit of fun. Also, there was no doubt that it was designed by the men who put it together.

Passing on, the lecturer showed an example of a French 16th century chair, on which the plough had been used as a moulding plane. This, he said, is how the moulding plane was suggested, and was a great mistake. The joiner thereby lost much of the practice of simpler tools, and mouldings were much more interesting when cut with simpler tools than when worked with the moulding plane. In earlier days, there was no attempt to make the mouldings continuous, and there were no mitres. As a contrast to this, the lecturer showed an example of a 17th century door, and pointed out the mechanically cut and mitred panels. The 18th century door was, he considered, the most constructional of all. There were no bolts to rot and stain the wood, and the mouldings were "stuck"—even glue was unnecessary.

Dealing with the furniture of the Sheraton and Chippendale periods, he deplored the mechanical hardness of the carving; but this is not surprising when we consider that they preferred the moulding cut by a moulding plane, to the moulding cut by hand.

Drawing attention to a magnificent old Scandinavian chair of the 10th century, wonderfully carved, which was shown on the screen, he pointed out that where primitive tools have been in use, as in the case of the Norwegian peasants, there is very little change in the work, and that the furniture produced by these peasants in the 18th century might have been made by the same men as produced that 10th century chair.

This change in the character of the work and the influence of tools on design, whether for good or evil becomes still more pronounced with the introduction of modern machinery. Machinery, he said, tends to eliminate the human element in design, and also the influence of materials on design. For example, just as a hand-cut moulding is more interesting than one cut with a moulding plane, so is an adzed beam more interesting in form and surface than one which has been machine-sawn and planed. Our tools and machines are nowadays often more works of art than the things they produce. When a man invents a new machine he is as pleased as a child with a new toy, and if it be a moulding plane he covers his work with mouldings; if it be a turning lathe, he not only turns table legs and chairs, but cuts them in halves and sticks them about his plain surface as applied ornament. The use of machinery also has a further effect in the nature of a reaction. This may be seen in the almost morbid desire of our designer to do something novel. He determines to do something new at any cost. We may go to any arts and crafts' exhibition and find it full of monstrosities. Where, however, there is a living tradition, we find neither this great divergence of types nor exact similarity: one type of species grows out of another type of species, just as one geological era follows another. He would not say that the invention of new tools and machinery is fatal to art, although since the invention of labour-saving machinery, we have sacrificed the man to the work. Our factory operatives, builders' labourers, and artisans are treated as hands. Whether they are employed on a building job, or at the furniture makers, they are employed as machines in a purely mechanical way, supposed to be animated by the mind of a single architect or designer, who is probably ignorant of the materials being used. In the Middle Ages, however, the craftsman was an important person, and the craft guilds were as important as the merchant guilds, and beautiful art and architecture was produced by them. To-day our craftsmen do not belong to their guilds, and have hardly any money to buy their furniture. Good work, he pointed out, is never cheap, and the apparently cheap art of the Asiatic costs as much in rice and macaroni as our English beef and beer. Finally, he expressed an opinion that craftsmen will never again flourish in this country until they are sufficiently important persons to be their own architects and designers, and to belong to their own craft guilds.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Mar. 8.	*PONTARDAWE (WALES). Offices for the Guardians, in Holly Street. Premium £10 10s. The premium is offered by the Guardians "for plans with abridged specification, *which in their judgment* are best suited." Particulars and conditions from C. B. Jenkins, Clerk, Herbert Chambers, Pontardawe, S.O., Glamorganshire.
Mar. 17	†NEW OFFICES FOR THE STANLEY U.D.C., DURHAM. Cost £3.500. Premiums £30, £20 and £10. Conditions, etc., to be obtained from J. G. Ridley, Clerk to the Council. Stanley S.O., Co. Durham.
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days.
April 10.	BOLTON BRANCH PUBLIC LIBRARIES. The Libraries Committee of the Corporation invite competitive plans from architects who have been principals in the County Borough of Bolton six months prior to the present date for Branch Public Libraries to be erected in the districts of Astley Bridge, Halliwell, and Gt. Lever. The plans and particulars may be obtained from Samuel Parker, Town Clerk, Town Hall, Bolton. Deposit, two guineas.
April 12.	ELLAND NEW SECONDARY SCHOOL. Architects having offices and practising in the West Riding of Yorkshire are invited to compete for the work in connection with the new Secondary School at Elland, and should apply for particulars to Mr. Leonard Clegg, Holiwell Green, near Halifax.
July 31.	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50. and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	BOURNEMOUTH BRANCH PUBLIC LIBRARY. Architects practising in the County Borough of Bournemouth are invited to submit designs for a new Branch Library at Boscombe. Particulars from Charles Riddle, Borough Librarian, Central Library, Bournemouth.

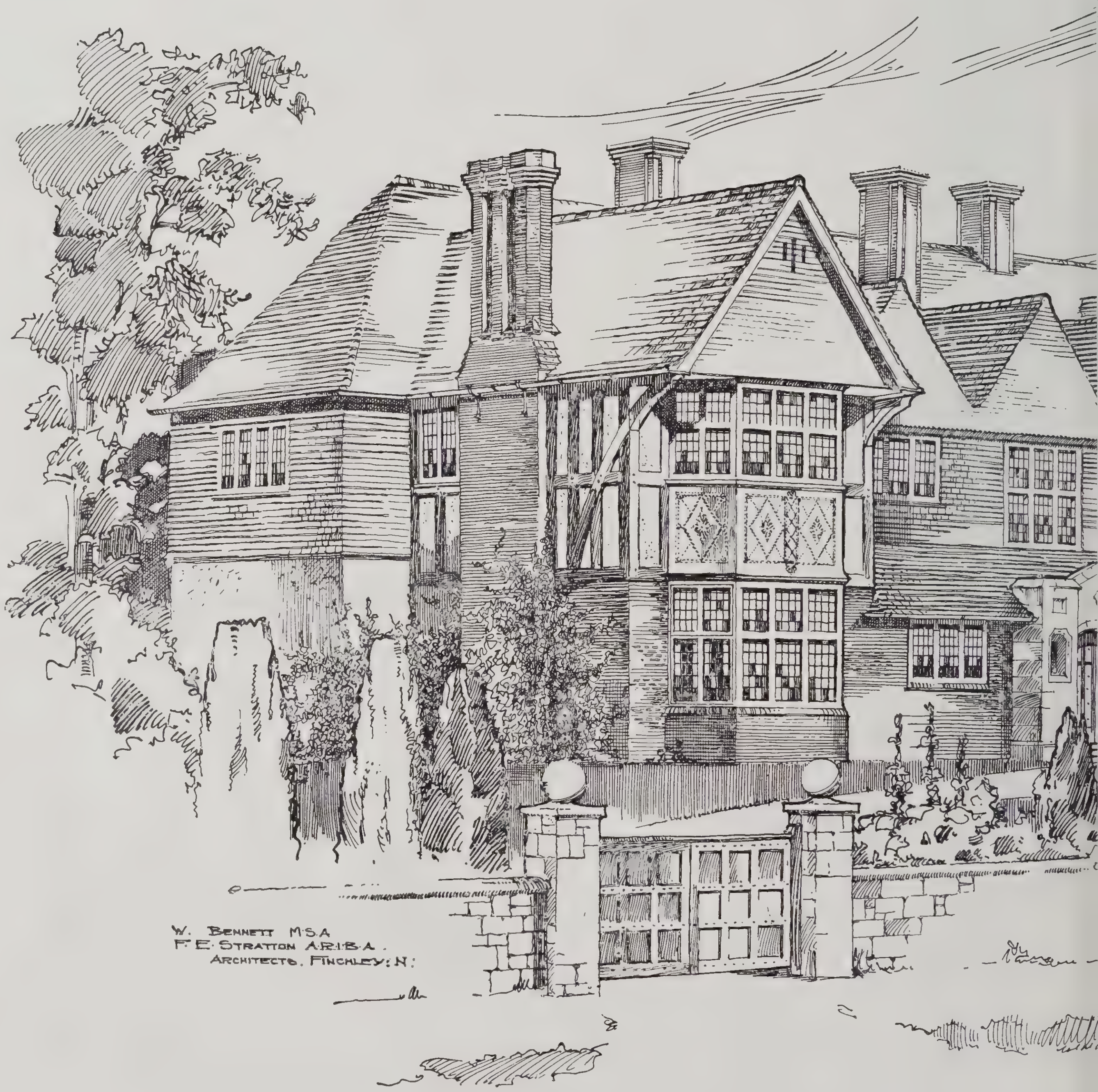
*We are advised by Mr. Jenkins that the supply of particulars and sketch plans is exhausted and no further applications can be entertained.

† The Royal Institute advises members not to compete.

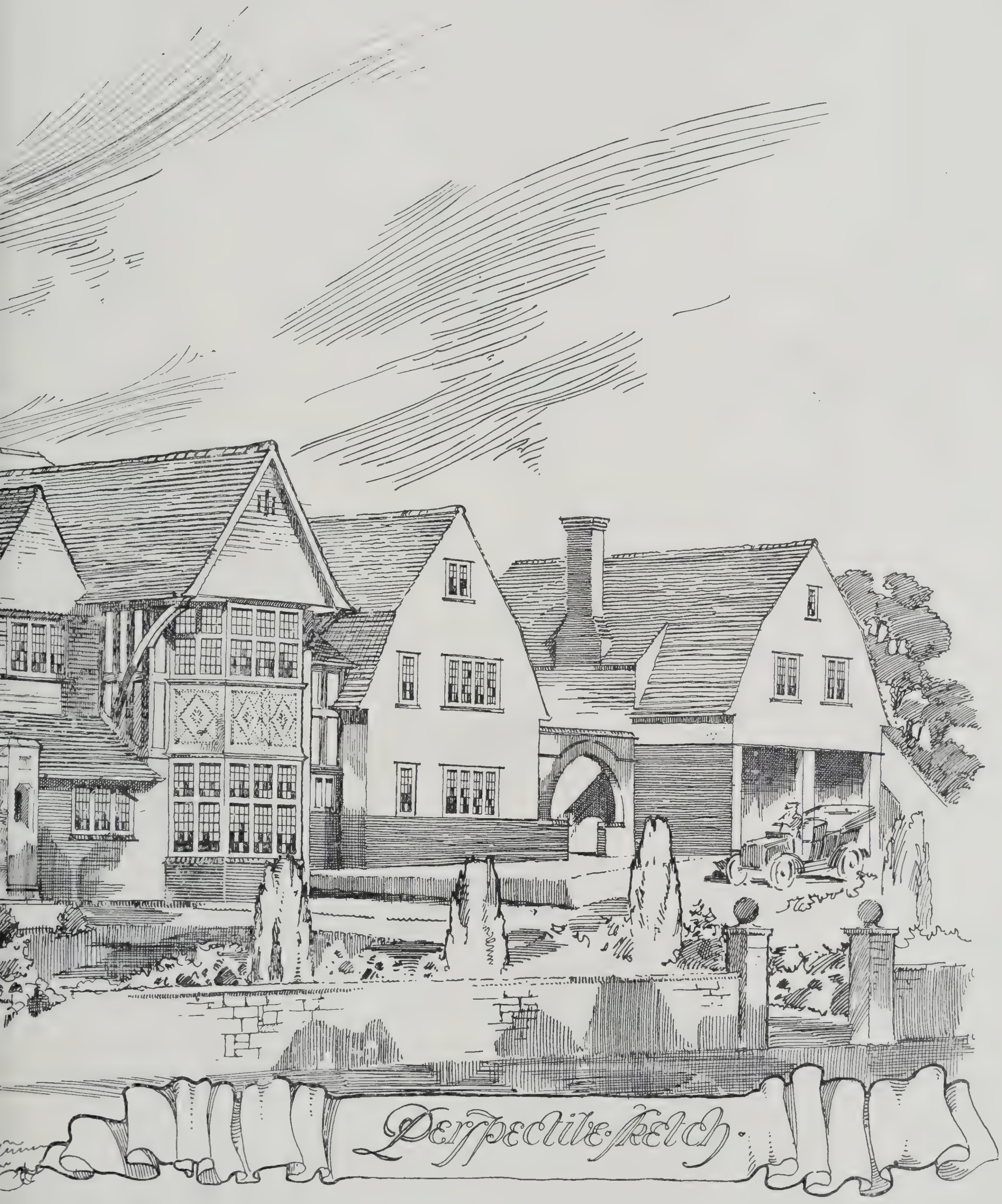
The Association of Master Painters in Scotland state, in their recently presented annual report, that the membership stands at 207. It is stated that trade prospects are brightening.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Supplement to THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER. *Wednesday, March 3rd, 1909.*



RESIDENCE, HENDON LANE, FINCHLEY,



BENNETT AND STRATTON, ARCHITECTS.

Our Plate.

Residence for G. Monro, Esq., jun., Hendon Lane, Finchley, N.

This house is now in course of erection on the Grass Park Estate, Finchley. The exterior is treated in a free style of modern domestic Gothic, with red Suffolk bricks, rough plaster, half-timbering and weather tiling, and the roof is laid with hand-made sand-faced tiles. Adjoining the servants' wing is a large motor house, with accommodation for three cars, with the chauffeur's quarters over. The main features of the interior are lofty and spacious reception rooms. On the west side overlooking the garden are the dining room, with walls panelled to the ceiling with richly carved and moulded walnut, and the music room, with a dark oak dado and a musicians' gallery. The drawing-room, which lies towards the south east, has a large bay window and inglenook. All these rooms are laid with woodblock flooring. The hall, which goes right through the house, is paved with black and white marble squares, and the walls are panelled. The outer hall is taken up the two storeys with arcaded gallery on the first floor. The main portion of the house is heated by hot-water pipes and radiators, by Grossmith and Co., of Southsea; and the house is wired throughout for electric light and intercommunication telephones, by Francis Vere and Co., of Finchley. The contractor is Mr. William Tout, of Brent Street, Hendon, and the architects are Messrs. Bennett and Stratton, Finchley.

Obituary.

We regret to record the death, at his house in Didsbury, Manchester, of Mr. James Brotchie Peace, after a comparatively short illness, at the age of 63 years. Mr. Peace was one of the founders of the firm of Messrs. Peace and Norquoy, builders, contractors and shop fitters, of Manchester, with whom he was associated for about 38 years. He was the patentee of the well-known folding partition, many thousands of which have been fixed. He was a prominent member of the Manchester, Salford, and District Building Trades Employers' Association.

HOUSE AT NEW MALDEN, SURREY.

The exterior of the house in Selwyn Road, New Malden, is carried out in white roughcast, and the roofs are covered with red sand-faced tiles. The external painting is of an apple-green colour, with the exception of the porch, which is of Oregon pine, stained with dark brown Solignum. Internally, a feature is made of the hall, which is lighted by a stained-glass window by George Wragge, Ltd. and is panelled to match the panelling of the staircase. All details have been studied with due respect to simplicity and economy. The builder for this work was Mr. E. D. Hobbs, Thames Ditton. The architect was Mr. Harold Kemp, of 29, Malden Road, New Malden.

Correspondence.

Puzzolana.

To the Editor of The Builders' Journal.

Sir,—Mr. J. H. Markham, in his paper on "Reinforced Concrete," read before the Architectural Association, is reported to have said: "Since Roman times, builders have not had the advantage of using such an excellent material as pozzolana, and concrete almost dropped into disuse."

Pozzolana, or puzzolana, mixed with blue lias lime, was used by Smeaton for the mortar for building Eddystone lighthouse, and it was specified in Government contracts to within the last fifty years.

At Chatham dockyard extension works, in 1867, it was specified to be used mixed with Roman cement, for all mortar below high-water mark.

T. P.

London, S.W.

LONDON MASTER BUILDERS' ASSOCIATION.

Annual Dinner.

The annual dinner of the members of the Association and their guests took place on Wednesday, February 14th, at De Keyser's Royal Hotel, Victoria Embankment, the attendance numbering about 130. Before the dinner, a reception was held. Mr. Wm. Lawrance, the president of the Association, occupied the chair, and was supported by Mr. J. Carmichael, J.P., president of the Institute of Builders; Mr. Walter Cave, F.R.I.B.A., president of the Architectural Association; Mr. F. L. Dove, L.C.C., past-president of the London Master Builders' Association; Mr. J. Randall, also a past-president of the L.M.B.A.; Mr. John W. Simpson, V.P.R.I.B.A.; Mr. G. L. Gomme, clerk of the L.C.C.; Mr. W. Shepherd, past-president L.M.B.A.; and Mr. Arnold E. Harris, J.P., F.S.I. president of the Quantity Surveyors' Association.

The loyal toasts having been duly honoured,

Mr. J. Carmichael, J.P., president of the Institute of Builders, proposed "The Architects and Surveyors." That the toast was both comprehensive and important, he was sure they would all agree. It was comprehensive because it embraced many of the ablest and most talented men of the time. Taking into consideration the high standard of efficiency to which the two professions had attained, and after some twenty-five years' almost daily experience of many of the leading architects and surveyors of London one formed the highest opinion of their ability and integrity. The duties of an architect to-day were much more difficult than they had ever been. Not only must he be an architect in the ordinary acceptation of the term, but he must have knowledge of many other subjects. In the first place, his client would ask his advice as to the value of the land, and as the building progressed, he would be supposed to know something about electricity, lighting, sanitation, hydraulics, engineering, and innumerable other subjects appertaining to building. So far as the architect was concerned, however, if he did not know all, he turned to the quantity surveyor, and whilst a certain amount of ignorance might be tolerated on the part of the architect, it was simply unheard of on the part of the quantity surveyor, whose business ability was hard to be surpassed.

Mr. John W. Simpson, F.R.I.B.A., V.P., R.I.B.A., said that in the absence of Mr. Ernest George, the pleasing duty devolved upon him of thanking, on behalf of the architects, the gathering for the reception of the toast. He could only confess that although it was perfectly true they did not deserve the nice things which had been said about them, it was certainly true that they ought to. It was pleasant to congratulate themselves upon the cordial relations between the creative and executive branches of the building trade. It was with some pride that he saw the absolute confidence placed in the architect by both parties to a building contract, and he felt that pride because he believed it was honestly justified. Although the architect was engaged in the interests of the employer, it was an accepted axiom that he would hold the balance level between both parties, and see that the builder as well as the employer suffered no wrong. He could look with no satisfaction upon executed work which had resulted in loss to the builder through no fault of his own. It was part of his duty to let him make a profit on honestly executed work. Trade was not so good as one could wish it to be. He thanked heaven that he was no politician and need not add the apple of discord to the dessert by voicing the virtues or vices of fiscal reform. But it was not often that one had the chance of addressing an assembly of the princes of the building trade, and now that their great courtesy compelled them to listen to him, he proposed to take a mean advantage and introduce an unpleasant subject. He meant, of course, the London County Council. They were at it again, they were indeed, and it was the usual thing, "an Omnibus Bill, full inside and out." It was extraordinary to note the tendency of official departments to straddle out and try to obtain more power and more work when already they possibly had more work than they could do. For instance, the Building Act of 1905 filled the mouths of the officials with more than they could digest but they now wanted more stringent powers, and were working in the face of the expert opinions of architects, builders, district surveyors, and engineers. The harassing and constantly increasing restrictions and vexatious regulations were acting injuriously upon the trade. When he heard politicians complain of the House of Lords, he was absolutely petrified by their ingratitude. They ought to thank God they had the House of Lords, and not the London County Council to deal with. The R.I.B.A. was fighting tooth and nail to obtain more moderate provisions, and in this new Bill he hoped they would have the active support and assistance of every master builder. The whole system of regular building in London was founded on a basis of fallacy. If the Building Acts were remodelled on the simple principle of specifying what might not be done, they might be of some value, but now they were pure nonsense, and the means of harassing those desirous of constructing buildings in the best possible manner. He made no complaint about the district surveyors or officials, but he did attack the Building Acts, and all their off-shoots. Solomon summed up the whole art of building when he said "Through wisdom is a house builded, and by understanding it is established."

Mr. Arnold E. Harris, J.P., F.S.I., president of the P.S.A., who responded for the surveyors, said he could not help thinking when Mr Carmichael so genially referred to the architects and surveyors, that architects might design and design, and draw and draw, and quantity surveyors might measure and measure, and bill and abstract; after all, where would they be without the builders? Therefore, he considered that the toast being proposed by the president of the Institute of Builders added very materially to the honour conferred upon the architects and surveyors, and he was glad to be able to express his own and his colleagues' appreciation of the honour. It was a source of great satisfaction that the relationship between builders and quantity surveyors was so cordial. There were very few instances in which the relations were other than cordial, and that he ventured to think was a real testimony the the fairness and impartiality of the surveyors. When they considered that in most large contracts the surveyor was appointed without any reference whatever to the builder—and most of those present would recollect that in the old days that was not so—because on many important occasions builders had a voice in the selection of the surveyor—he drew the conclusion that such cordial relations were a testimony to the general fairness and impartiality of surveyors as a body. His association was only a juvenile association, but everyone would agree that it had a very laudable object in view, viz., not only to educate the young surveyor, but to raise the status of the profession and improve the basis on which builders' contracts were founded by making it as near as possible an exact science, and eliminating all sporting items, so that the bill quantities should represent the actual work to be done in the building. He was sure that their objects in this direction would always meet with the cordial goodwill of the London Master Builders' Association, and with the co-operation of its members in every possible way.

Mr Walter Cave, F.R.I.B.A., president of the Architectural Association, next proposed the toast of the evening, "The London Master Builders' Association." He did not think the excellent work that had been done by the Association was generally known.

They worked very quietly, but they worked extremely well. It was thirty-seven years since the association was formed, and if he might recall the fact, it was brought about on account of the strikes in those days amongst the men. The very powerful unions and combinations then existing made it necessary that the masters, or employers of labour, should defend themselves against those powerful corporations. Therefore the whole inception of the society was its own protection. That had been the policy throughout, not aggression, and he believed that without statutory powers of any kind they had taken a great deal of work on their shoulders in the matter of the Conciliation Board. When a body of busy men took such a heavy burden on their shoulders, it showed that it was for the good of the whole building trade, and he thought they were very much to be congratulated in that they had already been successful in many instances in settling differences of opinion between masters and men. Without such settlement any building operations worthy the name could not possibly be carried on. He believed that during the past year there had only been one case brought before the Conciliation Board; that might be a matter for congratulation, but on the other hand, it might be an indication of the somewhat depressing times through which they were all passing. Mr. Simpson had referred to the amount of legislation that had been going on lately, and he thought it was a matter for regret that so much attention had been drawn to the details of their calling.

In responding to the toast, the president (Mr. Wm. Lawrance) said that in regard to the legislation of the London County Council in the matter of the County Council Powers Bill, which had lately been very much in evidence, he could only say that their Institute had been represented at several conferences in association with the R.I.B.A. and other institutions, and they had been very ably represented by Mr. James Carr, president of the Institute of Builders. With regard to the work of the association, he was glad to be able to report that their relations with the men had been friendly during the past year—possibly because of the depression in trade, but not wholly for that reason, because it was one of the principles of their association to consider all the relations between masters and men, and one of the great institutions necessary for that purpose had been the establishment of the Conciliation Board. There had been only one or two opportunities to meet the men, but even one was of importance, because then they considered their relations with the men, and at the same time were able to maintain and assert the principle for which they existed, viz., to maintain their right to carry on their business in their own way. With regard to the principle of their institution, they were not aggressive. They sought to establish and maintain proper, honourable and satisfactory relations between the men and themselves, and as an institution they honourably adhered to the laws made between masters and men. He thought if anything was to be said on that point, the London Master Builders' Association stood for absolute integrity; and having made proper and honourable arrangements with the men, they strove to carry them out. It was common knowledge that very great influence was brought to bear upon members of Parliament in the interest of labour organisation. It had been the duty, not only of their association, but the National Federation and other institutions, to watch carefully the Parliamentary Committees, and all measures affecting the trade, and in every respect to safeguard the interests of the builders, not only of London, but of England. He would express their indebtedness for the hard work given in defence of the right of the builders of the whole country, many useful opportunities having arisen during the year for the work to be performed. At the last meeting, Mr. Dove gave a very optimistic report upon the new premises to be taken by the association. He much regretted to say that Mr. Dove's forecast had not been fulfilled, and they were still without a home, except that at 31, Bedford Street. The negotiations for premises in Kingsway proved abortive, and other attempts came to nothing. He appealed to all present, and to all with influence in the building trade, to support their association. It had done splendid work during the thirty-seven years of its existence, and he thought there was no time more opportune than the present for them to remember that "union is strength." It was absolutely certain that there was now an opportunity for the whole interests of the building trade to be bound up together in one bundle, and he earnestly appealed to them all to support the associations so that if bad times came again they could fight the battles with great strength and vigour. He hoped the result of that night's gathering would be to create a new interest in the association, to enrol new members, and to consolidate the work which had progressed during so many years. Finally, he desired, on behalf of himself and the association, earnestly to congratulate their secretary, Mr. Costigan, on the great and good services he had rendered to the association during the past year. Their earnest and sincere thanks were due to Mr. Costigan.

The next toast, "Our Guests," was proposed by Mr. Ernest J. Brown, president of the National Federation, and past president of the L.M.B.A. He said they had already toasted some of the number, as architects and surveyors. They loved architects and surveyors sometimes, but there were others for whom they had affection, because they rendered them assistance in carrying on the trade of the great city. The great thing was that those visitors gave them credit; it was not very difficult to obtain, and they always seemed willing to give any amount of credit, and did not ask too many questions. Having given some humorous instances of hospitality extended to guests, Mr. Brown asked the visitors to assist the building trade by pulling down their palatial residences and having them re-erected. He would suggest they should never ask anyone to tender for a job who was not a member of the Builders' Association, as by so doing they would leave out those who reaped the benefit of the organisation throughout the country, but who never contributed a sixpence or a word towards the association or the National Federation of which he was president. With the toast he begged to associate Mr. Gomme, of the London County Council. He know perfectly well that Mr. Gomme was a friend to builders; he was a courteous gentleman, and all would agree that he was the right man in the right place.

Mr. Gomme said that he felt quite sure, in returning thanks for the guests on that memorable occasion, that every one of them except his unfortunate self, had enjoyed himself heartily. He had been reminded that there was such a thing as a Building Act. Well, he happened to be somewhat of an historical student, and he had read a Building Act passed in the reign of King Stephen. Builders were not allowed to do all kinds of things in that reign which they could do in the present reign, and it had to be remembered that the object of the present day legislation was to effect something useful to the community. He would venture to point out that legislation was not aimed at members of an association like the London Builders' Association, who were banded together in order to do the best they could for their profession, but rather it affected the weaker links of the chain. In rebuilding that great city of London—and it was being rebuilt — the London County Council did want to see it rebuilt in such a way that in sixty or a hundred years hence it would not have to be destroyed again, but built for all time, and be held up as an example to the rest of the country, both for its building and its planning. He was very ambitious for the good of London, and if the building and kindred professions would assist the Council in bringing about necessary reforms and in improving the weakest links of the chain, they would produce in the near future a London of which they would all be proud.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Duodecimally Divided Slide Rule.

FALMOUTH.—E. R. writes: "In the last paragraph of an article by Mr. A. E. Fletcher in 'The Builders' Journal' of February 3rd, mention is made of a duodecimally divided slide rule. I presume this is an instrument for squaring dimensions in feet and inches. If so, will you kindly inform me where such an article can be obtained, and its probable cost?"

The duodecimally divided slide rule invented by C. Hoare, which I have, is a very old one, and bears the name of Aston and Mander, 25, Compton Street, Soho, W. I am not aware whether these can still be obtained, but a slide rule with a duodecimally divided scale has been recently brought out by Mr. A. G. Thornton, of Manchester, the price being, I believe, about 4s.

ALAN E. FLETCHER.

Frontage Line Question.

HERTS.—M. writes: "An urban district council rejects plans of alterations and additions because the proposed addition projects beyond a straight line between front main walls of buildings to right and left. The frontage line—i.e., road edge—is not straight, but convex, and the distance from the front of the proposed addition to the boundary of the opposite property is 50ft., while the forecourt to property dealt with will be about 12ft., and that of property opposite 5ft. There is a by-law that the width of road shall not be less than 40ft. from the front of the proposed building to the opposite boundary. In the event of the council continuing to refuse, what steps could be taken to compel them to give the written consent necessary under the P.H. Act? Have such steps been taken frequently or successfully in such cases? Otherwise, is the game worth the candle, the improvement value to the property being but moderate?"

The statutory law upon this subject is practically all embodied in section 3 of the Public Health Act, 1888, and that clause has been frequently quoted *in extenso* in these columns. There is nothing in the Act to say that a straight line must be drawn from the front wall of adjoining house to that of the house on the other side—a curved line in consonance with the curve of the street may very fairly be adopted under the circumstances you describe. If, however, the urban district council in your case will not agree to this, I do not think you will be well advised in attempting to force their hands; they are entrusted with discretionary powers, and may refuse to exercise them if they so choose. I believe your only course of action at law will be by making an application to the High Court for a "mandamus" calling upon the council to show cause why they refuse to pass the plans, but I do not consider the "game would be worth the candle," as the French proverb expresses it.

F.S.I.

Sichel Size.

BANBURY.—SANITAS writes: "Do any of the experts on your staff know anything of Sichel size, which is said to be three times as strong as ordinary size, and to possess the advantage of not requiring heating?"

Sichel size has been used by the writer on many occasions, and he has nothing but praise for it. It is a vegetable size of great strength, quite odourless, and it dissolves in cold water, and mixes well to form distemper. It is very valuable for preparing whitewash, distemper, etc.; in fact, it is in every way much better than ordinary size, which is, of course, of animal origin. In appearance it is white, almost like milk. It is manufactured by Leo Sichel, 93, Aldersgate Street, London, E.C., and I advise you to get a sample and experiment with it. The same firm make a paste based on the Sichel size, which is exceedingly strong, and keeps sweet almost indefinitely. J.

Tithe Rent Charge on Building Land.

SOUTH-EASTERN COUNTIES.—TITHE BARN writes: "Various properties were purchased by a corporation, under powers granted by Act of Parliament, for street improvements. The lands were subject to a tithe rent charge. Frontages were set back, boundaries re-arranged, and plots sold for building. A new street was made over part of the land. (1) Are the present owners of the land (corporation or those who purchased from them) liable for tithe in proportion to the areas held by them, so that the total amount received by the tithe owner is the same as before, but redistributed? (2) Is the tithe payable whether land is in use or not? (3) Must the corporation commute the tithe for the land now dedicated to the public in the form of roads, or can they evade payment? Doubtless the existence of the charge was taken into consideration when they purchased, and they may be assumed to have paid so much less for the land as would allow of their paying now for commutation."

(1) No; each owner is liable to pay to the tithe owner the whole of the awarded amount, the receiver of the tithe rent charge having no right to constitute himself an apportioner. Should any one owner be thus called upon to defray the whole of that rent charge, he has a right to recover a proportion of it from each of his fellow landowners. The usual procedure in such a case as this is that the tithe owner should collect his full quota from the largest individual owner, but there is no law to compel him to do so, and he may claim it from any one of the owners he chooses. (2) Yes. (3) The corporation cannot be compelled to commute the proportion which would fall due as a fair share upon their roads, but they must pay their proportion of the annual charge in the same way as any other owner. Your argument as to the lower price because of this outgoing, holds good not only against the corporation, but against the persons to whom they subsequently sold land. It is possible for any of the owners to apply to the Board of Agriculture for a reapportionment of these tithe rent charges, provided that in no case can a sum of less than five shillings be charged upon any one plot; if the plots are of a smaller value than that sum the Board may direct that each person should redeem his proportion of the rent charge. You will find full information on this question in Mitchell's "Rates and Taxes," published by Effingham Wilson, Threadneedle Street, E.C., at 3s. 6d. F.S.I.

Liability for Quantity Surveyor's Fees.

WALES.—G. H. writes: "I took instructions from a client, gave sketch designs, complete working drawings, details, and specification of a house costing about £1,200. I sent the drawings to a young quantity surveyor, whom I knew to be excellent at his work, and who asked to do my quantities at 1 per cent. Am I personally liable to the quantity surveyor?"

Unless you can very clearly show that you gave instructions to the quantity surveyor as agent only for your client, there is no doubt that the full liability for his fees will fall upon yourself. F.S.I.

By-laws and Sanitation.

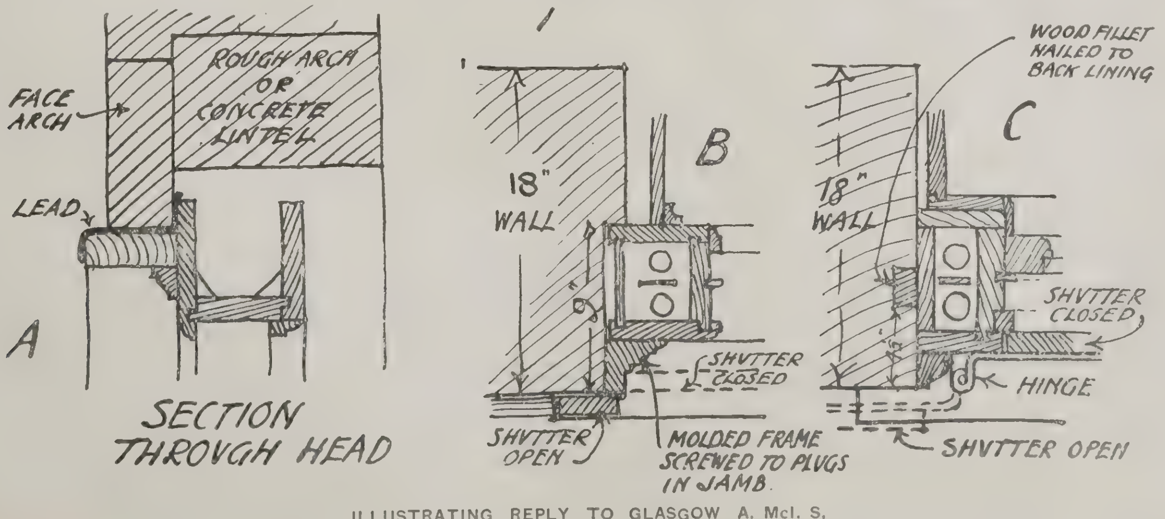
PROVINCES.—E. J. B. writes: "Plans were deposited with an urban authority for forming a new w.c. and lavatory within the building of a large hotel. The urban council refused to pass the plans, and the medical officer of health and surveyor inspected the premises and condemned the whole of the sanitary fittings and drains, and called upon the owners to instal a new system. The owners are willing to meet the council as far as possible, but many difficulties are present. There is no proper system of sewers in the town, but there are main drains into which, in a few cases, crude sewage is discharged, and also the overflows from cesspools are carried. These drains discharge ultimately into the river, but are undoubtedly public sewers, as defined by the P.H. Acts, and have been so long before the creation of the urban authority, as sewage has been directly carried into them from time immemorial. The owners are willing to do all possible to meet the urban council, but it is impossible to comply with the by-laws with respect to the cesspool; the confines of the property will not permit a new cesspool to be constructed the prescribed distance away. Can the urban council cut off the present drains directly connecting with their sewer without providing other facilities for getting rid of the sewage?" [Sketch enclosed, but not here reproduced.]

(1) No; the sanitary authority must acknowledge that any conduit taking the sewage away from two or more premises, "not within the same curtilage," is a sewer, and no resolution or determination of the urban district council can alter their legal responsibility for a sewer, however it originally came into being. (2) Yes; provided that such a w.c. is otherwise in accordance with the local by-laws. If you are likely to get into a difficulty with the council, I advise you to consult a solicitor before the case goes any further. Generally, there is no doubt whatever that the sanitary arrangements, as shown on your sketch, are very obsolete, and should be amended at once—the long lengths of soil pipe laid inside the building are particularly objectionable. W.c. No. 1 should be turned round and be furnished with a proper soil pipe, drain and intercepter, outside the building, and discharging into the sewer near the front angle of the hotel. I should also consider it to be very desirable that the existing cesspool should be abolished and a direct connection be made to the sewer—it is much too near to the building now. Proper interceptors should be put in every drain, before it leaves your premises, to prevent the passage of sewer gas back from the sewer. F.S.I.

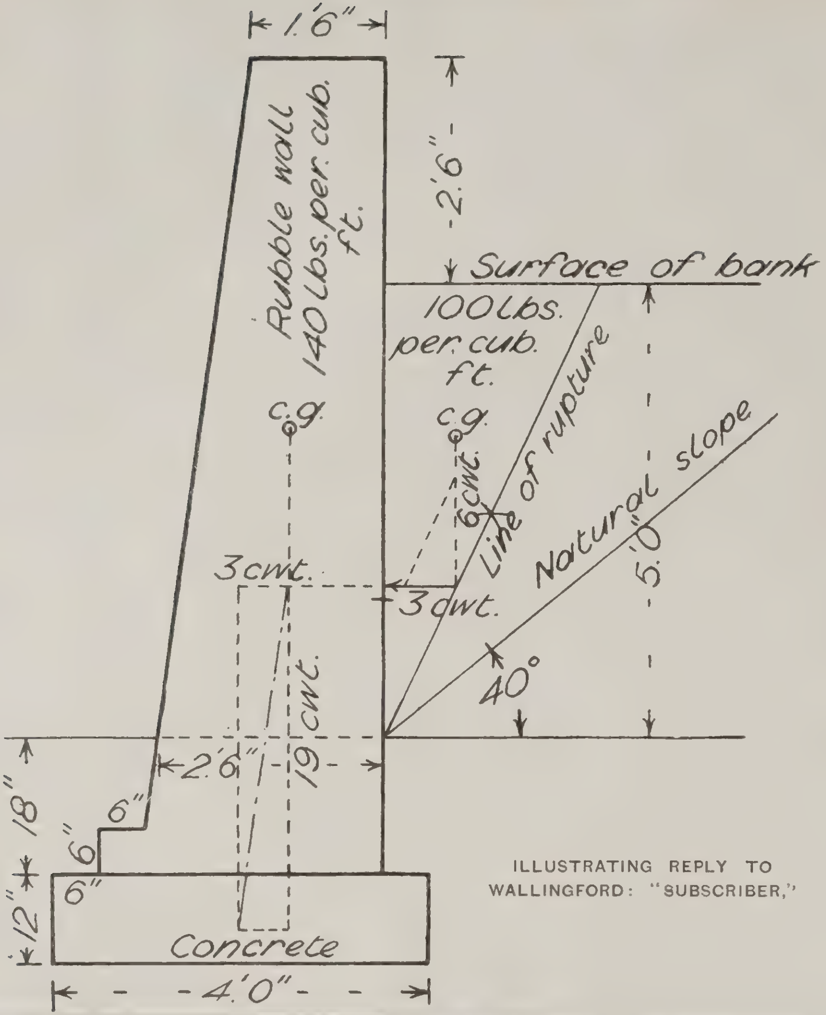
Arranging Double-hung Sashes.

GLASGOW.—A. McI. S. writes: "Kindly advise as to the best method of arranging double-hung sashes with shutters, after the manner shown on accompanying sketches [see illustration], whereby there would be the least possible chance of water coming in, while the desired effect of having the cases to show in the form of white architecture round the window opening would not be destroyed. I also send sketch of section through main cornice of house, with window sashes immediately below, and should be glad to have the benefit of your experience as to the best treatment for making a satisfactory job. The type of house I purpose building is similar to a Georgian house illustrated in Mr. Ernest Newton's book of 'Country Houses'—a large brick house with shuttered windows."

Exposed cased sash frames are most frequently built into straight reveals without any check whatever, but in this instance, owing to the very exposed position, it is probably wise to provide one, and the form you show should prove quite satisfactory except in the case of heads of windows not covered by the cornice. Presumably, these windows have gauged face arches; in this case the best means of protection would be a strip of lead as shown in sketch A. If the frames are built in, it will be a simple matter to arrange for this leadwork, but if they are put in after the work is up, the lead must be placed in position on the arch centre before the arch is built. The Georgian frames did not usually set so far back as 4½ins. from the wall face. Alternative plans through jambs are given in sketch B and C—the latter an American plan; with both of these the frame approaches nearer to the wall face, and a single wood moulding is sufficient to cover the brick reveal. Outside shutters are usually hung with parliament hinges, screwed to the sash frame, but I do not recommend them, and either of your suggestions is preferable. The section through eaves is quite practicable, but it might be suggested that beam filling raised from concrete lintel to the underside of the roof boarding would be an improvement. G.



ILLUSTRATING REPLY TO GLASGOW A. McI. S,



ILLUSTRATING REPLY TO WALLINGFORD: "SUBSCRIBER,"

Rubble Stone Boundary Retaining Wall.

Wallingford.—Subscriber writes: "Please advise as to the strength of the wall of which particulars are enclosed." (Of insufficient general interest to warrant reproduction.)

It appears in this case that a rubble stone boundary wall with concrete core is required to act in places as a retaining wall to a bank of earth 5ft. high. No description is given of the nature of the earth to be supported, or of that upon which the wall rests, so that average conditions must be assumed to exist. Taking the section of wall to be as shown in the accompanying illustration, the resultant thrust, found graphically as shown, cuts the ground level at the centre of base, and the maximum stress will be $\frac{W}{A} = \frac{19}{2\cdot5} =$ 7.6 cwt., or 0.38 tons per sq. ft. compression. Two courses of footings, 6in. deep, with 3in. projection, may be substituted for one course with 6in. projection if preferred. It is not desirable to have two different mixtures for mortar in the same wall; lias lime may be used throughout. It can be built in 60ft. lengths, racked back as proposed. The stones below ground may be rough, but should be solidly bedded in lias mortar. The concrete may be reduced to 9in. if the bottom is good, but 12in. is better.

Henry Adams.

Property in Old Materials.

Hereford.—H. S. writes: "Repairs having been executed at certain old premises, the contractors carted away the old material. The proprietors demand its return, but the contractors hold that as there was no mention of the matter in the contract, they had a right to follow the custom of the trade with respect to old materials. Please favour me with your opinion."

The contract must have been very loosely drawn, if it neither expressly, nor by clear implication, laid the responsibility for the removal of the old materials upon the contractor. I am of opinion that the contractor was within his rights in taking away the waste material and retaining it; because it was not reserved to the employer, and no doubt the contractor would have been quite unable to do the specified work unless he did so remove the old work. I cannot say that the "custom" is so definite as you state it, but, on the whole, I think it possible that such a plea might successfully be set up in a court of law.

F.S.I.

Glass Furnaces.

Staffordshire.—Architect writes: "There are, I believe, certain firms who produce a patent melting furnace suitable for the manufacture of glass bottles. These firms are, I believe, chiefly German and American. I have the address of a firm named Siemens, but there is a firm, 'Dixon,' whose address, together with the names and addresses of a few other firms, I am anxious to obtain. Dixons erected one of their furnaces at Tutbury. Perhaps you can supply me with the information I require?"

(Can any of our readers oblige with the required information?—Ed.)

Books on Reinforced Construction.

Dinas Powis.—L.W.B. writes: "Please recommend books on reinforced concrete construction."

The best books on reinforced concrete construction are those by Messrs. C. F. Marsh and W. Dunn (either the large work at 31s. 6d. nett, or the handbook at 7s. 6d. nett), and "Reinforced Concrete Construction," by Buel and Hill, 21s. nett.

Stonework Quantities.

Cambridgeshire.—Stonework writes:—"I have a set of quantities, which includes stonework with the following heading:—'Box ground stone as described at first floor level, including all sawing and waste, rough sunk work and preparatory 'setting out' beds, joints, faces, etc. Is this the usual heading for stonework? The various labours follow, and I shall be glad to know whether these labours (including the beds and joints) would be in every case the net measurement of finished work, especially with respect to the traceried windows."

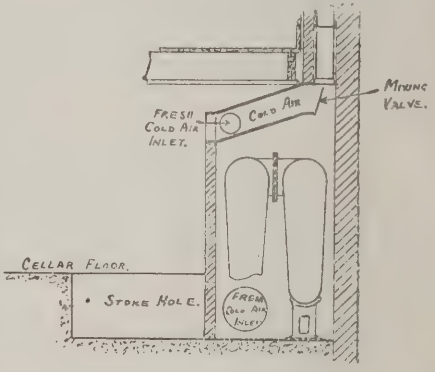
The description of the cube stone is not unusual, the labours included being all preparatory work. The labours to beds and joints, being included in the heading, will not be separately measured. In a bill of quantities where these labours are measured, they will be taken from the cube out of which the stone will be worked. Further labours are taken to include all previous labours necessary to produce them, and will be nett. The superficial area of the stone out of which the stones in tracery are obtained is measured both sides as plain work.

Calorifers or Basement Stoves.

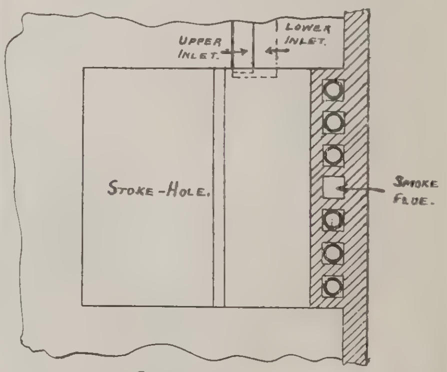
London, S.W.—Devereux writes: "In 'Specification' for several years running, calorifiers or basement stoves, are described in detail. Can you, in your 'Enquiries' columns, give a typical plan and section of their construction, and the names of firms of repute who undertake this system of heating?"

Calorifers vary too much in their details to permit of one drawing serving for the main features of all. All the best makes have a furnace, lined with fireclay, in which the coke burns, and pipes or chambers through which the smoke travels ere it reaches the chimney. The ease of sweeping out dust and soot from the flues and of cleaning the outside surface are points to be noted when selecting an apparatus. The cleaning of the air-flues is also to be noted, though these can often be swept from the rooms down to the heating chamber. The accompanying sketch will give some idea of an installation. The following firms make and instal calorifers:—J. Langfield and Co., Manchester; Haden and Sons, Trowbridge, Wilts, and London; John Grundy (the "Heim" calorifer), Tyldesley, Lancs. and London; J. Constantine and Son, Manchester; Musgrave and Co., Ltd., Belfast and London; Crumblehulme and Co., Bolton, Lancs. There are other firms in different localities who do this work. With this and "Specification," you should be able to select a good appliance.

Ingenior.



Cross Section.



Plan.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

AMERICAN CIVIL ENGINEERS' REPORT ON REINFORCED CONCRETE.

A special commission, appointed by the American Society of Civil Engineers to report on the subject of concrete and reinforced concrete, has recently drafted their report which, for the time being, is referred back, and will be discussed and probably amended in important particulars before being adopted by the Society. The report, when complete, should be important and worthy of close attention, for not only is the American Society of Civil Engineers a very important authority, but American engineers have had much more experience than engineers in this country, and they regard things from a more practical standpoint than is customary on the Continent or in England. The English Institution of Civil Engineers have also appointed a committee to deal with the subject of reinforced concrete, and the outcome of their deliberations will be awaited with much interest, as the Royal Institute of British Architects specially appointed committee on the same subject, which some time ago issued a report that seems to have become an accepted standard of practice. The R.I.B.A. Committee did not definitely pronounce upon rules for all details of reinforced concrete construction nor for all purposes, and their exclusion of these features was due to the fact that the scientific understanding of the minor problems of reinforced concrete design was incomplete, and that further study was desirable before coming to a conclusion in the matter. The same conservatism seems to dominate the American Commission; but though the whole of the members expressed their conviction that the laws of design have by no means been adequately determined as yet, the commission has drawn up majority and minority reports, and both alike place the question of design of reinforced concrete as in a position of progress solely. The main report consists of a resumé, without citing authorities or tests, of what its authors consider conservative present practice. The minority report states plainly that sufficient information has not been collected by the committee and incorporated in its report on which to base the details of design and methods of calculating stresses recommended by the majority, particularly as such recommendations will have much weight with the public because of the high standing of the Society. The first part of the report advocates the placing of all design work in the hands of specially experienced engineers not affiliated with contractors, giving them complete supervision, and holding them equally responsible with the contractors for the result. Such advice is not unexpected, for the American Society of Civil Engineers is mostly composed of professional men, and it is natural that they should advocate the professional point of view. The only objection to the independent engineer is that he is divorced so much from practice, and in all branches of engineering we find that many contractors employ their own designers, and that the engineering profession has a tendency, as specialisation progresses, to draw into two classes, i.e., those who are affiliated with firms of contractors or manufacturers, and those who are solely consulting engineers. The latter often do prepare designs, but it seems more and more general for them only to prepare general schemes, and to leave the detailed design to the specialist engineers affiliated with contractors. The latter method is certainly the most economical, and where it is a matter of economy we do not think the public will allow any other system to succeed. However, the pious expression of faith in the independent engineer may serve to comfort a little the professional element in the American Society, and the procedure will be settled by the public and the efficiency and fundamental economy of the varying methods of working as time goes on.

Then the American Commission proceeds to make more practical recommendations. It believes that a detailed study of the connections between reinforced concrete members is desirable, together with such designs of the reinforcement as shall preclude the possibility of displacement. Then it advocates definite tests of concrete aggregates. It urges the provision of special reinforcements to take account of shrinkage stresses, although it makes no allowance for such stresses in the assumptions it advances for the design of reinforced concrete beams. It is all very well to call attention to such a point, but it would be more helpful if some advice as to how to make such allowance were given. No doubt such stresses may be important, but it is difficult to ascertain what such stresses are and their effect, and how to guard against them. The committee recommend a thickness of 1½in. of fireproofing on monolithic concrete columns, at least a 2-in. covering over the metal of other columns, 1½in. over that of beams, and a minimum of 1in. in the case of short-span floor slabs. American opinion inclines to the belief that these recommendations err in being too conservative, for it is urged that to add to the deadweight and cost of the structure by increasing the usual fireproofing allowances on floor slabs from 10 to 30 per cent. is unwarrantable, as the effects of fire can almost invariably be easily repaired, and even a failure from fire damage will at most be local, and can do comparatively little harm. The usual provision in this country is ½in. protection for the metal in floor slabs, and this we ourselves believe to be sufficient. We are, however, with the committee in regard to a 2-in. protection for columns, and 1½-in. protection for beams, for fires and fire tests have conclusively proved that anything less is not sufficiently fire-resisting. The main supports of fire-resisting floors should be adequately protected; but the floor slab itself needs little protection, and ½in. is sufficient in our view. We cannot follow the committee in objecting rather strongly against the plastering of concrete surfaces. We cannot see any serious objections, and until some more satisfactory and economical method of finishing the surface has been found, we have no doubt that reinforced concrete floors and walls, etc., will continue to be plastered. The committee's majority report recommend various working stresses for the materials in reinforced concrete structures, but they do not give any indication of the reasoning upon which these recommendations are based. The subject is prefaced by the remark that the stresses specified may be increased up to 25 per cent. only when the best materials are employed, and only the finest workmanship is provided, and they should be reduced when concrete of less than 2,000 lb. compressive strength is used. The stresses recommended are as follows:—

Concrete.

Compression:	
For bearings	650lbs. per sq. in.
For axial compression	450lbs. per sq. in.
In banded columns ...	540lbs. per sq. in.
In columns with both bands and longitudinal rods	650lbs. per sq. in.
In bending	650lbs. per sq. in.
(With extra allowance near supports.)	
Shear:	
Pure shear	120lbs. per sq. in.
Combined shear and diagonal tension without steel, 40lbs., up to 120lbs. where full steel reinforcement by stirrups is employed.	

Steel.

Tension	16,000lbs. per sq. in.
Compression	16,000lbs. per sq. in.

These are high stresses, higher than those recommended by the R.I.B.A. committee, and it is to be doubted whether the raising of the limit is advisable for ordinary work. Trade designers will be tempted to add the 25 per cent. to them, which is recommended for the best work, and use the figures thus obtained for ordinary work. We are glad to see the opportunity given for higher stresses to be employed when proof is given that the materials can be so safely stressed, and that the design and workmanship are well done; but we think it unwise for a professional body at the present time to advocate such relaxation of the conservative figures provided by by-laws and advised by other societies. Such advocacy will only be used by unscrupulous or ignorant trade interests to sail still closer to the wind, with possible and, indeed, probable, detriment to the industry and danger to efficiency and life and limb. However, we hope that on more mature consideration the American Society will issue a report that will be more worthy of it, and a little more helpful than the majority report of its commission promises to be.

WHEELS OF REINFORCED CONCRETE.

There seems no end to the purposes to which reinforced concrete may be applied. The latest, and somewhat surprising, development is that the material has been used for the construction of heavy wagon wheels, for which patents are being taken out in the United States. A renewable steel tire is used on the outside just as is done with a wooden wheel. The rim and hub only are of concrete, the spokes being of wood, boiled in oil, coal tar or crude petroleum, to prevent the absorption of moisture and decay. The bearing in the hub for the axle is made of chilled steel to give it long wear. The advantages claimed for this reinforced concrete wheel are that it is practically everlasting, is not affected by any climatic conditions, and its cost to build is not over one-half as much as the all-wood wheel. It can be made at any spot by anyone, as there is no difficult work required in building it: all that is necessary is to set the spokes in position and pour the cement mixture into the mould.

The third general meeting of the Concrete Institute was held on Thursday, February 18th, at the Royal United Service Institution, Whitehall, S.W., Mr. Edwin O. Sachs presiding over an excellent attendance of members, among whom were the following:—Mr. Lucien Serraillier (who read the paper, of which a portion was given in last week's issue, the remainder appearing this week). Prof. Hy. Adams, M.I.C.E., and Messrs. F. E. Wentworth-Sheilds, M.I.C.E., A. Alban Scott, M.S.A., E. Fiander Etchells, G. C. Workman, J. Munro, M. Kahn, Herbert E. Brooks, E. Benedict, M.I.C.E., A. B. Jocelyn, Thos. Potter, Harold H. D. Anderson, Alexander Drew, Alfred Brooks, Alfred Fidler, E. P. Wells (hon. treasurer), and H. Kempton Dyson (secretary).

The Chairman said it was the custom to make an announcement as to the increase in the membership of the Institute. At their first meeting they had 300 members, and the second 401, and between then and this meeting they had increased to 551.

A REINFORCED CONCRETE AQUEDUCT.

By Robert S. Walker.

(*Concluded fom page 96, No. 730.*)

While the piles were being driven, carpenters worked on the forms for the tow and berm path slabs, on the eastern side. As will be seen in Fig. 10, these two slabs overhung from the two side walls of the canal, and were carried on two concrete beams, one on each slab respectively. These beams were in turn supported on an extension of the buttress and middle walls. The forms for this part of the work were erected on much the same lines as the main canal bottom. Troughs were made for the beams, and supported on 6in. by 6in. timbers. Cross pieces of 6ins. by 6ins. were run across from the cap pieces to the side walls, to carry the planking for the slabs proper.

The process of erecting the western arch was similar to that of the eastern, except in the case of the canal side wall on the tow path side. Here provision had to be made for two sluices, ways, and a spillway over the top of these. The wall was also increased in thickness on account of the openings.

The gates used were of the usual sluice type, and designed to operate vertically. They were constructed of steel plate, strengthened by angle irons riveted on the back. Bronze rubbing strips were screwed on both to the gates and guide bars, with brass countersunk screws. A rack and pinion gear was used for raising and lowering, two racks being provided on each gate. The operating mechanism consisted of two vertical shafts, with the upper ends squared, which ran down from the tow path, and engaged with the pinion shafts through worm gears. Handles fitted on to the upper ends of the vertical shafts enabled the gates to be operated from the tow path.

Owing to the delay caused by the rivers flooding, the work was so put back that the concrete in the western canal side walls had only been in a few days when the time was up. As the State wanted to refill the canal, a temporary wooden wall had to be built inside the concrete one to take the strain until the concrete had set sufficiently. This temporary wall was afterwards removed by means of a floating derrick.

The work as completed is shown in Fig. 14.

Reinforcing.

All the reinforcing in the work was of steel bars, in sizes varying from ½in. to 1¼ins.

Buttress Walls.

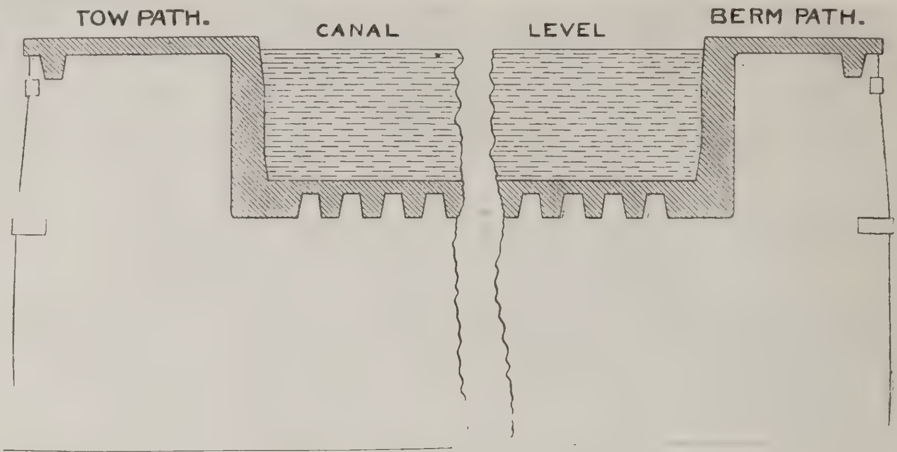
7-8ths in. bars were used in these, placed vertically and spaced 12ins. apart, every alternate bar being bent 4ft. from the bottom about 2ft. out of the straight to follow the line of the toe at the bottom of the wall. All the bars were placed about 3ins. from the surface of the outside of the wall, thus serving as tensional bars to resist the pressure of the earth filling behind.

Middle Wall.

This had no reinforcing.

Wing Walls.—Fig 11.

These were reinforced with 7-8-inch and ½-in. bars, the ½-in. bars being set vertically and spaced 12ins. apart; the 7-8-inch bars horizontally, and spaced 6ins. apart for the eight lower rows, and then 9ins. apart on the remaining. This scheme of reinforcing was placed on both sides of the walls, 3ins. from the surface.



CROSS SECTION OF AQUEDUCT.
FIG. 10.

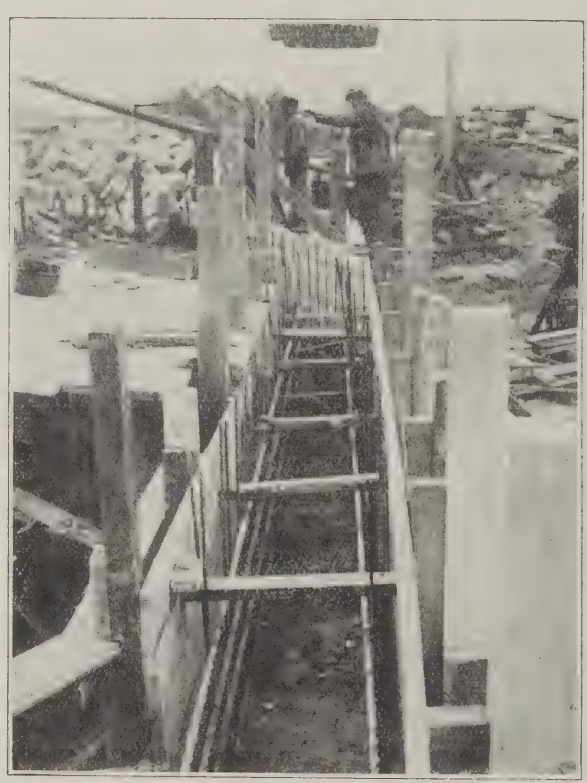


FIG. 11. VIEW OF FORMS FOR WING WALLS PARTLY FILLED, SHOWING REINFORCING BARS.

Canal Bottom.

This was formed of beams with a 12in. slab on top, monolithic with them. The beams were reinforced as follows:—Two 1¼in. straight bars were set at the bottom 2ins. from the surface, and two 1¼in. rods bent up at the ends set about 2ins. above them. Finally, a 7-8-inch bar, bent as shown in Fig. 12, was placed between these latter. The slab was reinforced with ½in. bars spaced 12ins. apart and set at right angles to the beams. These bars were set 2ins. below the surface.

Canal Side Walls (Excepting Wall with Sluice Openings.)

These were reinforced in practically the same way as the wing walls described earlier.

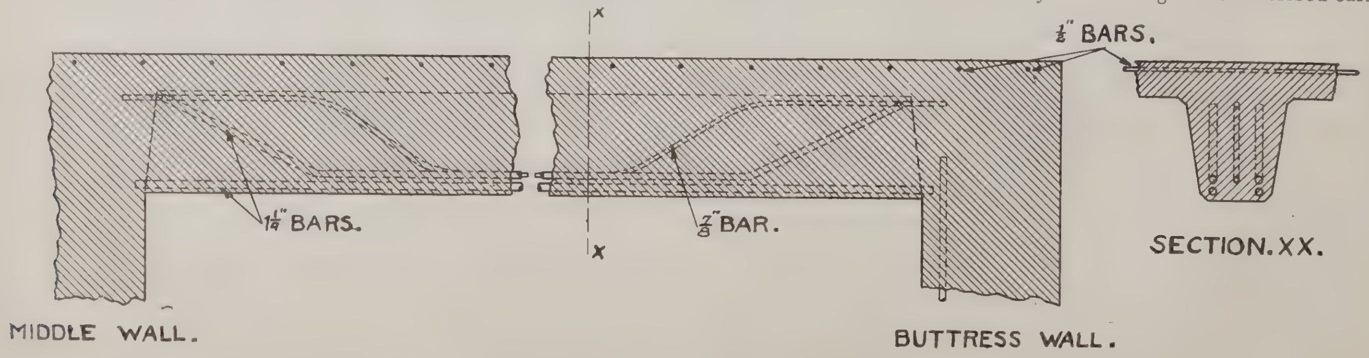


FIG. 12. SECTIONS OF BEAMS IN CANAL BOTTOM.

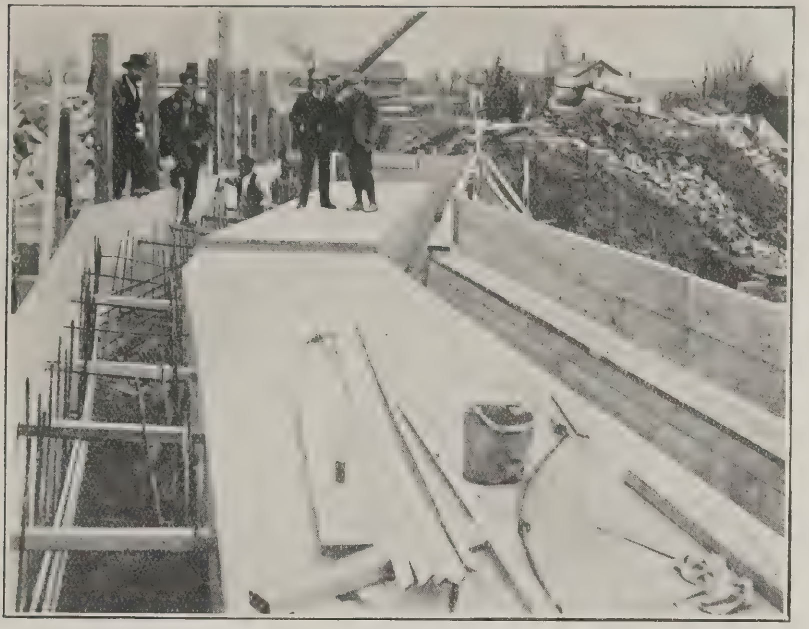


FIG. 13. VIEW OF FORMS FOR BERM PATH SLAB AND SUPPORTING BEAM, SHOWING CANAL SIDE WALL PARTLY COMPLETED

with the exception that the bottom six rows had 1in. bars.

Side Walls with Sluice Openings (Approximately 3ft. thick).

This wall, being weakened by the sluice and spillway openings, was reinforced with ½in. and 1¼in. bars. The ½in. bars were set vertically, approximately 12ins. apart. They were omitted where the openings occurred. The 1¼in. bars were set horizontally, spaced 6ins. apart. These were also omitted where the openings occurred.

Town and Berm Path Slabs (12 ins. thick). Fig. 13.

These were reinforced with ½in. and ¾in. bars. The ¾in. bars were set crossways to the path, 3ins. from the bottom surface, and spaced 12ins. apart. On top of these, ½in. bars were set at right angles to them and spaced about 2ft. 6ins. apart. Then 3ins. from the top surface ½in. bars were set crossways to the path and spaced 12ins. apart. On top of these again, ½in. bars were set at right angles to them, spaced about 2ft. 6ins. apart, and so arranged as to be staggered with the lower row of ½in. bars running lengthways with the path.

Tow and Berm Supporting Beams.

These were reinforced in practically the same way as the beams in the canal bottom, with the exception that the 7-8ths. inch bars were omitted.

Concrete Mixing Plant.

The mixing plant consisted of a two-storey covered shed, the mixers being on the ground floor. A hopper with a collapsible bottom was fitted in the floor of the upper storey with a shoot running down from it into the mixer hopper. Runways were erected to the stone and sand piles, and to the cement store shed. The stone and sand were wheeled up the runways by gangs of men with wheelbarrows, and dumped direct into the upper hopper in correct proportion for the batch. A man stood by the side of the hopper and dumped in the required amount of cement, according to the mixture required. Then the bottom of the hopper was collapsed and the contents let into the mixer. Another man operated the mixer, and took care of the water supplied to it. Immediately the upper hopper was empty, the bottom was shut, and another batch dumped into it. In the meanwhile the first batch was mixing, and as soon as it was properly mixed it was run out into the concrete dumping buckets on the derrick, swung around and put into the forms. Directly the mixer was empty the man operating it signalled to the gang above and the next batch ready in the hopper was let down into the mixer. This system worked admirably, and as many as 235 batches of ½ cub. yards were handled in ten hours.

Two Ransome mixers were installed. They were belt driven from a horizontal engine. Only one was used at a time, the other acting as a stand-by.

The erection of this aqueduct was undertaken, and, in spite of many mishaps, successfully carried out in the specified time by C. E. Parsons, C.E., of Albany, N.Y. Fig. 14 shows the work completed.

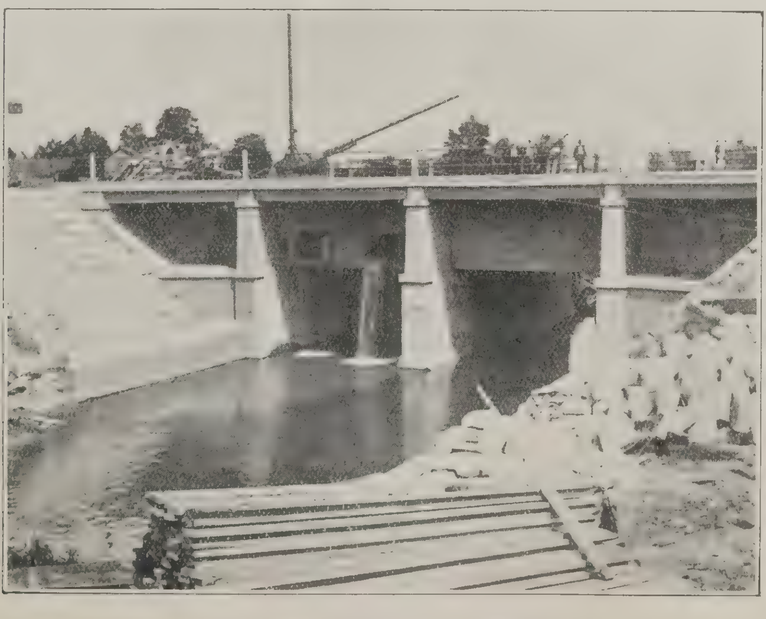


FIG. 14. NEW AQUEDUCT COMPLETED.

A LONDON STEEL FRAME BUILDING.

The Selfridge Store.

In the new building at the corner of Oxford Street and Duke Street, London, W., erected for Mr. H. Gordon Selfridge, now nearing completion, we have an example of the modern steel-frame structure which, until the last few years, was typical of the United States, but not adopted here. The Ritz Hotel was the first example of a typical steel-frame building erected in London, and at the time of its erection we gave a series of articles illustrated with many detail drawings of the steelwork, framing plans of the steelwork of every floor, and photographs of parts and of the whole in course of construction, for we thought that it was desirable for us to describe the system, new to us, of construction as fully as possible, for the benefit of the English architectural profession and building trade. That structure, designed by the same engineer as the Selfridge Store, and executed by the same contractors, was, however, not quite so advanced or so thoroughgoing a steel-frame or skeleton construction as that developed in America. It made many concessions to English tradition, and the steelwork was designed to fit an architectural plan already made and not particularly designed for the use of the steel skeleton construction. To some extent, of course, the Ritz Hotel was not quite the kind of building that lends itself to the most economical framing. In this building the first consideration was to be suitable arrangement of rooms for an hotel. The Selfridge Store was, however, from the first designed as a steel-frame structure, and schemed to make all parts work well together and secure the greatest economy. There are, of course, some points in which the structure does still not exactly use the system to utmost advantage, but that is because our London Building Act was not framed for such structures, and unduly thick walls were insisted upon.

However, the building marks a considerable advance on previous London structures, and we have therefore thought it desirable to describe and illustrate the Selfridge Store in considerable detail, first, in order to provide our readers with accurate information upon this modern method of construction; and, secondly, to afford a record of a landmark in the progress of modern building construction. With that object we have arranged for Mr. S. Bylander, the contractor's engineer responsible for the engineering design, to describe the construction in detail, and the first part of his article appears below. We illustrate in this issue some details of the steel grillage foundations, the plain and reinforced concrete retaining walls, the reinforced concrete floors, and some steelwork details, as also some photographs taken at various stages of the work, showing the construction generally, and the progress of its erection, which was very speedy. In future issues we shall publish many further illustrations of the construction. The Selfridge Store belongs to the modern type of warehouse construction, and the latest improvements, not only as regards the steelwork, but in many other directions, have been adopted. It is probably the most interesting and up-to-date building of its kind in the Metropolis.

Great credit is due to the different parties concerned for the excellent results which have been obtained, both as to beauty of design and stability and rapidity of construction. The architects are Mr. R. Frank Atkinson, F.R.I.B.A., of London, and Messrs. D. H. Burnham and Co., of Chicago. The contractors are Messrs. Waring and White (1906), Limited, whose engineering department has prepared the design and working drawings for the steelwork, foundations, and floors. It must in fairness be stated that, to the satisfactory results obtained, Mr. Selfridge has contributed more than anyone else, by his bringing into play, with unremitting energy, his great business ability and his knowledge of organising this class of work.

The building occupies a site between Oxford Street, Duke Street, and Somerset Street, the frontage to Oxford Street being about 250ft., and to Duke Street about 175ft. The entire area has been built upon, and no central court or area has been constructed. The building is designed with the object of obtaining as large rooms as possible, and is constructed on the most up-to-date methods for the prevention of fire.

It is the first building where the authorities have permitted so great cubical contents in each portion of the building; and, further, by special consent, the door openings have been made 12ft. by 12ft., thus facilitating better planning to sales rooms.

Every floor in the building will be used for sales rooms, except a portion of the basement floor, which will be used for storing material, and the third basement, which is occupied by machinery.

The flat roof is 80ft. above the street level, and the foundations are 60ft. below the street level. The total height from the foundations to the top of balustrading is 150ft.

THE CONSTRUCTION OF THE SELFRIDGE STORE.

By S. Bylander.

Steelwork.

The building is constructed as a steel frame, although the exterior walls are carried on piers, and no columns are placed in the exterior walls. The internal division walls are carried on steelwork, except the centre party wall, which is self-supporting, and also carries the floor load.

The building contains about 3,000 tons of constructional steelwork, and it may be of interest to know that it was erected at the rate of about 125 tons per week.

The contractors, Waring and White (1906), Limited, made the steelwork drawings, and also carried out the erection, and during the construction about 12,000 blue prints were in use, of which about 2,500 were 40in. by 27in. in size, not including the architectural drawings and drawings for sprinkler and heating systems, etc.

The foundations are spread by means of grillage beams, on which are resting the cast-iron bases supporting the columns.

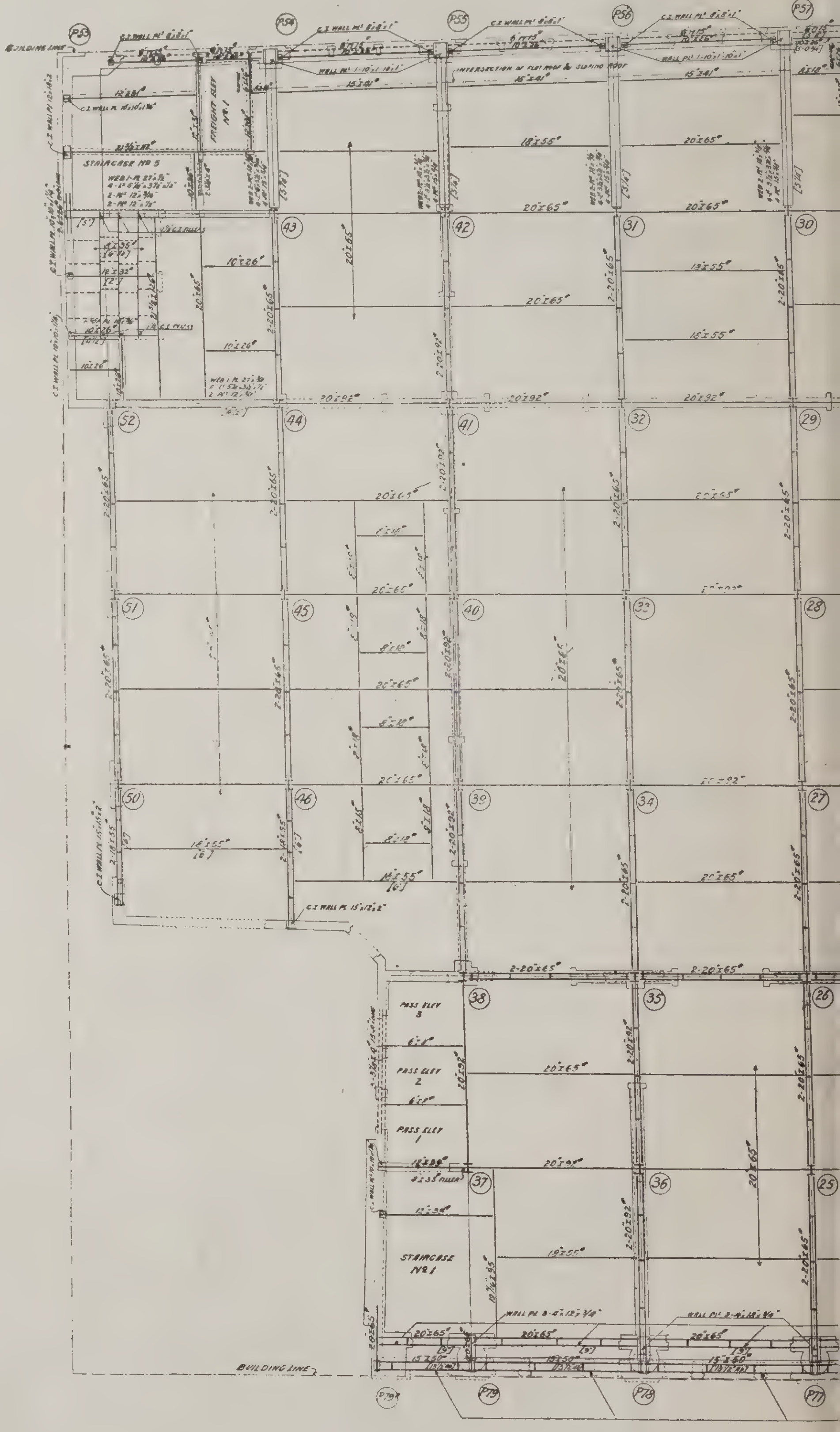
The columns are placed in straight lines parallel to Oxford Street, and the distance between them is 22ft parallel to Oxford Street, and 24ft. in the other direction, the centre lines of the columns making an angle of somewhat less than 90 degs. (87 degs.).

The panels are all alike, although slightly on the skew, great advantages being obtained by this regular setting out of the panels, minimising the possibility of errors and also the amount of details required. The columns are built up of plates and angles; rolled steel joists or channels have not been used.

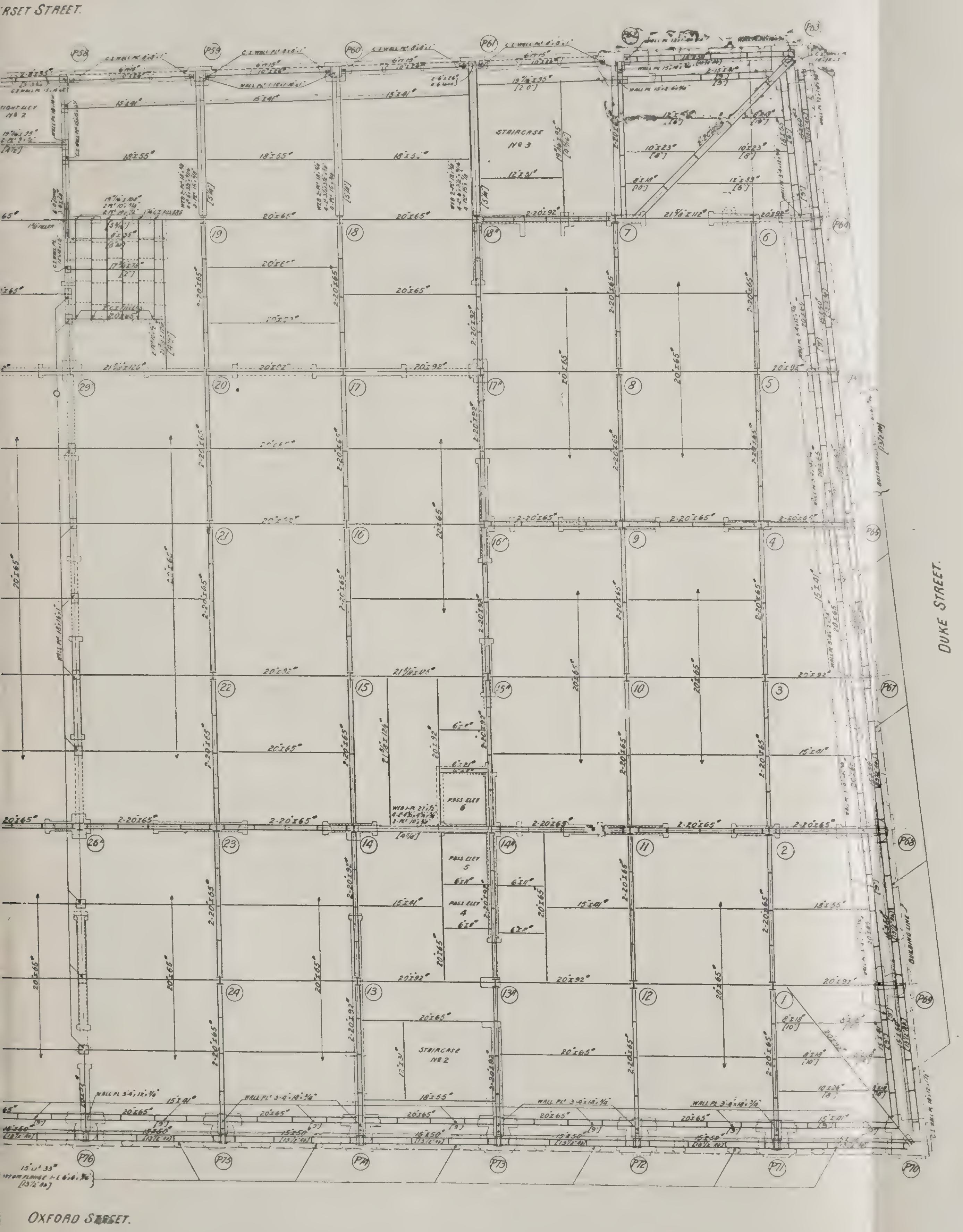
The lengths of the columns were designed for two storey lengths, the splice of the columns being made about 1ft. 6in. above the floor level. The splice plates were riveted to the flanges of the columns, and no cap plates were used.

The girders are carried on angle brackets, and supported by stiffening vertical angle-irons, which outstanding leg is cut on the splay to suit the architectural cap.

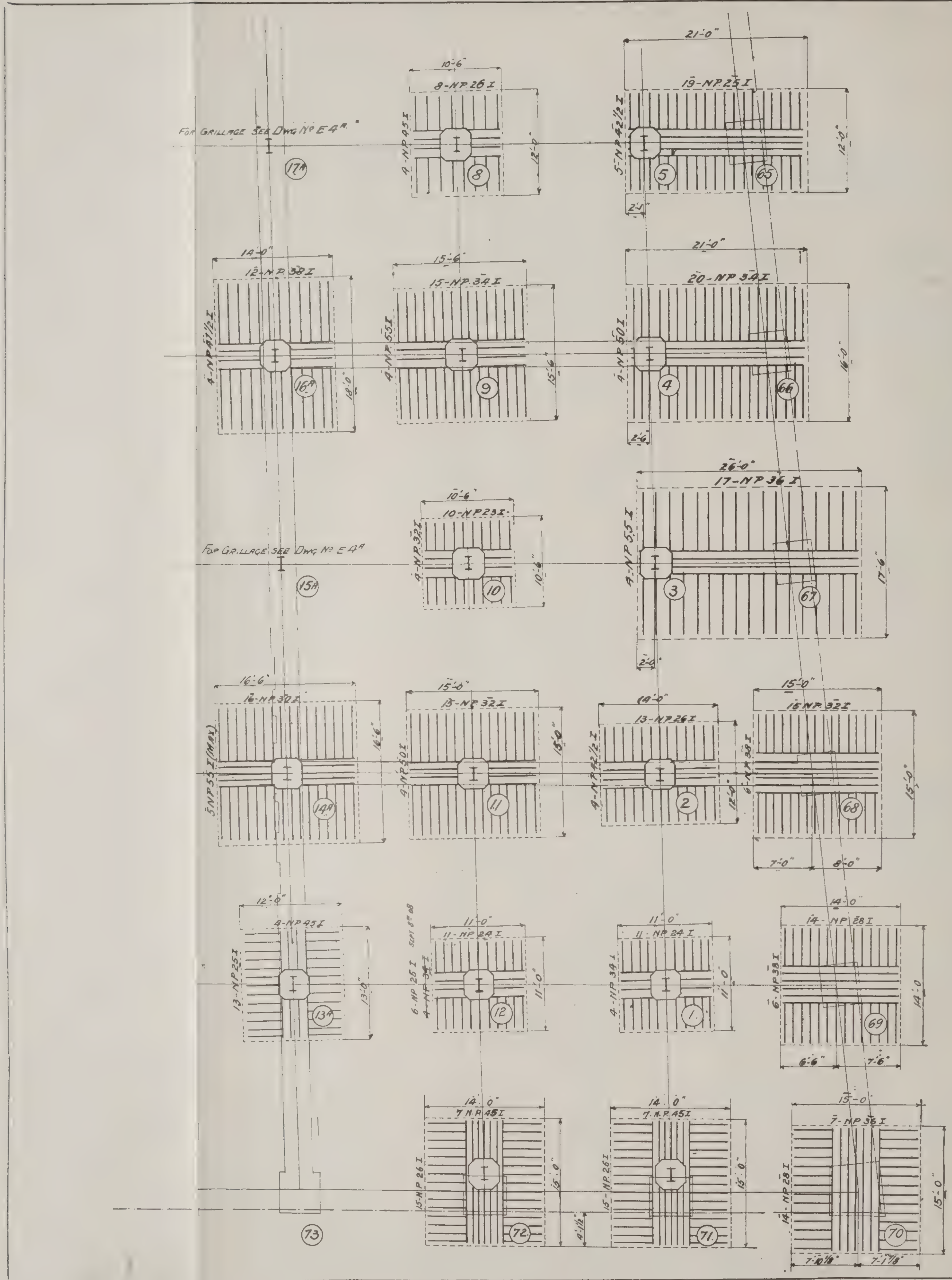
The diameter of the steel columns had to be made small in order to suit the diameter of the architectural columns.



SELFRIDGE STORES,



ORD STREET, LONDON. STEELWORK PLAN, SECOND FLOOR.



THE SELFRIDGE STORES, OXFORD STREET, LONDON; PORTION OF GRILLAGE FOUNDATION PLAN.

The ends of the columns were planed perfectly square to their axes in order to provide a proper butt joint.

The floor framing consists of 20in. deep beams for all standard panels, two beams being used in the direction of 24ft. span, and one beam being used placed 12ft. centres for carrying floors.

Twenty-inch beams of special heavy section have been used for carrying the division walls.

All connections between girders and beams, and between girders and columns, were riveted. Cast-iron separators have been placed between the double beams to afford greater stiffness.

Retaining Walls.

The retaining walls around the site are constructed in plain concrete, except that to Somerset Street, where a reinforced concrete retaining wall is constructed 60ft. On page 191 is shown the section of plain concrete wall and spandril at base and ground floor.

Trenches were made for the retaining walls before the excavation was completed, and the retaining walls were put in before any other work was done. The reinforced wall was built in its entire length at one and the same time. The excavated branch was 200ft. long, 25ft. wide, and 60ft. high. The earth pressure was resisted by horizontal pitch pine struts 10ins. by 10ins., placed 3ft. centres vertically and 6ft. centres horizontally.

(To be continued.)

HE CONCRETE INSTITUTE.

THE COMMERCIAL ASPECT OF REINFORCED CONCRETE.*

By Lucien Serraillier.

(Concluded from page 172, No. 733.)

Data.

The client, the lecturer thought, should reember that the more complete information supplied to the specialist firm he employed e more expeditiously and intelligently would s plans be prepared. Particulars concerning e loads to be carried, nature of soil and undations, materials available near site, ere essential. Architects should say hether the specified loads included the dead ad or not; the tendency to omit this inrmation often placed reinforced concrete in fair comparison with ordinary steel joist nstruction.

The nature of the test load should be ecified at the outset. Sufficient attention as not paid to the question of fire protecon. The nature of the aggregate, whether arp or smooth, a specification of the ment and its setting time, the breaking and astic limits of the steel, whether concrete ould be mixed wet or fairly dry, etc., ould be stated. The height of the floor ove ground when only one floor had to be pplied would materially affect the price, and even the scantlings of available timber for centreing, will, if known beforehand, enable the beams to be so designed as to utilise it without waste and thereby effect a saving. So that no details were so insignificant as to be despised.

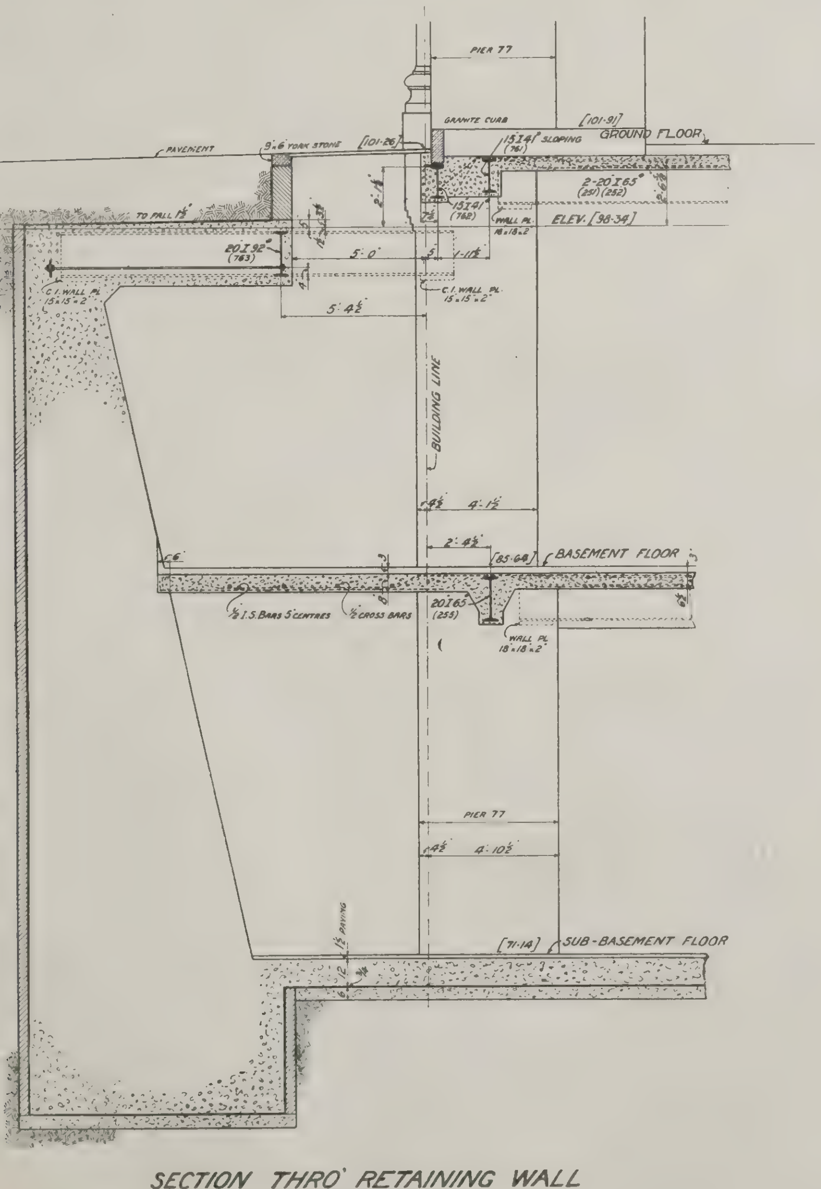
A point on which confusion often arose was the factor of safety. A comparison of competitive designs on a large contract would frequently reveal an extraordinary diversity in the factors of safety when these were reduced to the same denominator.

The client should at the outset clearly indicate whether designs were to be tendered upon by contractors selected by him or by contractors associated with and approved by the specialist firms. This saved time and useless correspondence, and would enable the latter to give detailed information to contractors with whom they were not associated when these were specified by the client, which was not necessary in the case of contractors with whom they worked together. Clients should, in justice to competitors, place them all on the same footing, and any deviation from this rule should be resisted by competing specialist firms, who should co-operate in refusing to submit designs under conditions which did not give all the same chance.

Preparation of Designs.

When inviting competitive designs, the client should not ask for too many details at the outset, but should be content with diagrammatic plans which indicated the system proposed sufficiently clearly to enable him to make a selection. He should remember that plans were generally prepared free of charge by specialist firms, and consideration should be shown by not throwing too much useless work upon them. The present tendency was to require too much detail before the selection of a specialist firm was made, and this was particularly irritating when schemes were only in their initial stage.

It was a regrettable fact, to which attention must unfortunately be called, that designs obtained from one specialist firm were sometimes sent by the client to a competitive firm to see if the latter could improve upon them. A design was the property of the designing firm, and should be respected as a privileged communication until the client had acquired it on the terms on which it is submitted. The communication to a rival was a breach of faith which the lecturer suggested should be met by a joint undertaking by specialist firms to refuse work offered under such conditions.



SECTION THRO' RETAINING WALL
.OXFORD ST.

SELFRIDGE STORES, OXFORD STREET, LONDON.

Estimates.

Generally the client was in a tremendous hurry for his plans. Hurry meant mistakes, and for these the specialist firm had to suffer. The modern system of bustle and strenuousness, so much admired in another hemisphere, was peculiarly unsuitable for reinforced concrete, for in this, more than in any other branch of construction, more haste meant less speed. Engineers and architects who took months to mature a plan expected very often full detailed plans by return of post. Specialist firms should resist such demands, and refuse work for which a proper time allowance was not made, rather than risk a disaster which may affect the whole industry.

Differentiation of Work.

There was a present tendency to lump all classes of work together, and to invite tenders on the whole contract, even in cases where the reinforced concrete portion is relatively insignificant as compared with the remainder of the contract. It could not be too strongly insisted upon that reinforced concrete was a separate subject altogether, and that the portion of a contract which concerned it should be scheduled apart from the other portions of the same contract, and separate tenders invited upon it. In the case where the reinforced concrete portion was the most considerable part of an important contract, the other portions might form sub-contracts. But it was essential to differentiate the reinforced concrete from the rest, so that the estimates from specialist firms might be compared together on their merits without being affected by other portions of the contract. A satisfactory tender would frequently be spoilt by the addition of excessive sums for other portions of the work with which the contractor was not familiar, and for which he provided too large a sum to cover himself against possible loss. This occurred specially in cases where prices were sent in hurriedly and the specialist firm or the other contractor had no time to obtain sub-estimates.

Payments.

It was desirable that specialist firms (B) which supplied reinforcing material should receive payment for this and for their designs, if these were charged for, direct from the client, and not from the contractor as at present. This would avoid the frequent unjust detention of moneys for materials supplied to the contractor by the withholding of the necessary certificate of payment when the contractor had failed to satisfy the engineer or architect.

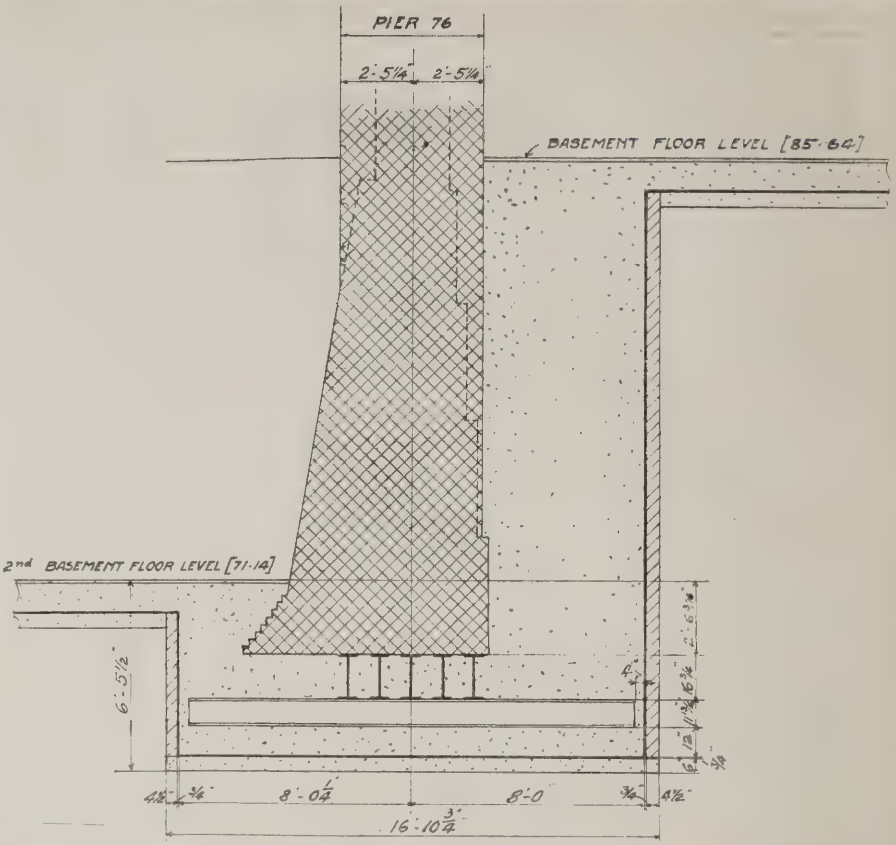
Discussion.

Mr. F. E. WENTWORTH-SHIELDS said he was sure they all owed a deep debt of gratitude to Mr. Serraillier for his most interesting paper. He pointed out to them that reinforced concrete had brought into being a number of what were very rightly called specialists, specialists of all kinds, the designing specialists—he did not use the word in any invidious sense—and the merchant specialists, and they had done an immensely good work in this country. Mr.

---

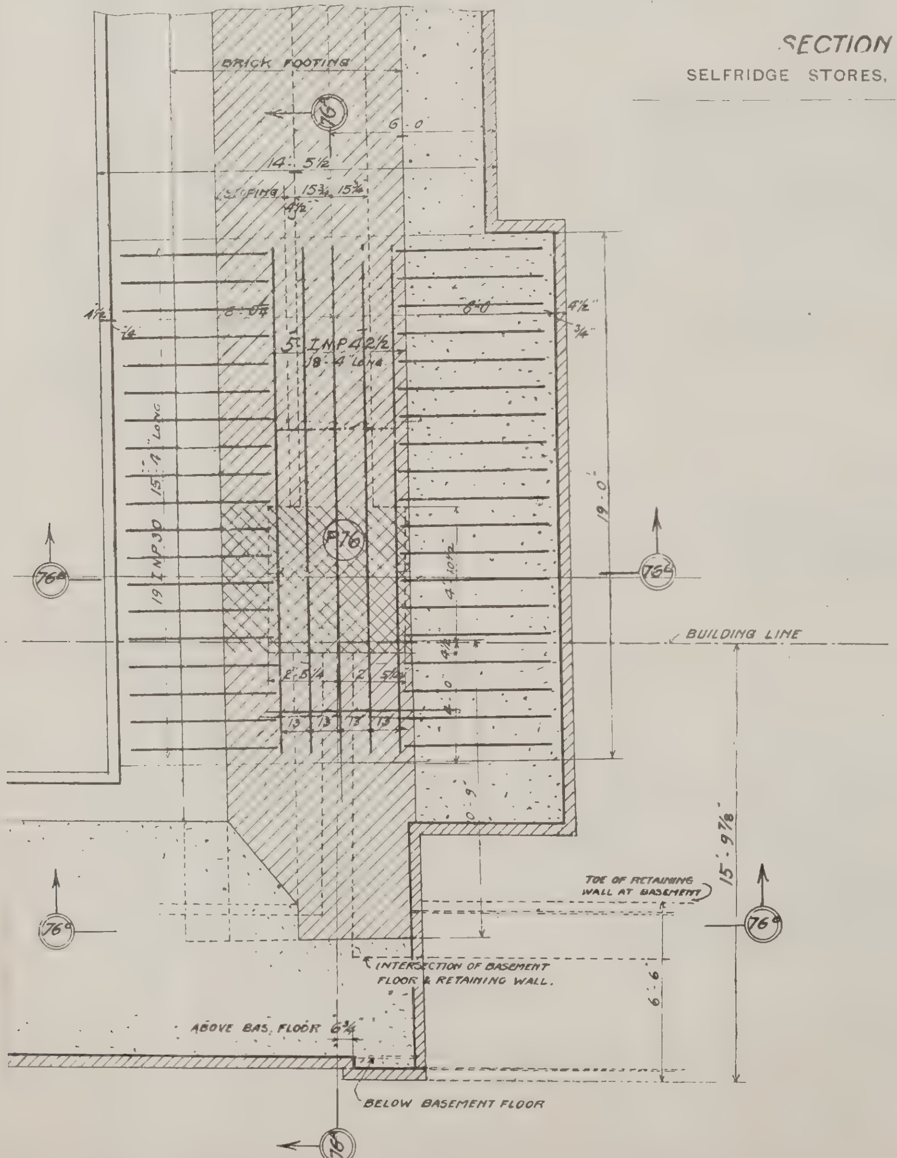
* Abstract of paper read by Lucien Serraillier at the ird General Meeting of the Concrete Institute, bruary 16th, 1909.

Serraillier had pointed out a good many difficulties under which they had to work. In fact, his paper might almost be called the bitter cry of the reinforced concrete specialist. Personally, he was very sorry for the specialist, and one reason was that he had done a magnificent work for them, and yet, he thought, he was bound to disappear. At all events, he thought the designing specialist was bound to disappear, and he thought before he went they ought to say that they owed him an immense debt of gratitude. He had preached reinforced concrete in season and out of season to a very apathetic public, and by means of inventions and investigations had done an enormous lot to push forward the use of this most useful material. But he was bound to go, he thought, simply because history repeated itself. They were very much in the same condition now as half-a-century or more ago, when the use of wrought-iron and steel girders was first practised. Before that time arch and suspension bridges were common, but when steel girders first came in—he thought the Britannia Bridge over the Menai Straits was the first large girder bridge ever built—people were extremely suspicious of wrought-iron girders, and some thought it was not quite right that thin steel plates should be built up in such a way as to carry heavy loads. But as confidence was acquired, the extended use of girders might be said to have been brought about by girder-designing specialists. As time went on, and as every young engineer and architect got familiar with the practice of girder designing, the specialist died out, and with or without the assistance of a trained draughtsman, a man designed his own girders; and he thought the same thing would eventually happen in regard to reinforced concrete. He thought the time would come when the architect or engineer would make his own design. Of course, it might be said that the fact that a great many designs were in the hands of patentees would prevent this, and that the patentees would naturally prefer to make their own designs. It might be a heresy, but he thought the time would come, before very long, when the fact of having a patent would not be of very much value to a designer. Some of the patents had already expired, and he thought the time would very soon come when an engineer or architect would be able to make his designs without fear of infringing any patent whatever. He would like to say a word about failures. He thought what the author had said about the necessity for giving full information about failures was most important. He remarked a little further on in his paper that the Local Government Board had rather set their faces, apparently, against reinforced concrete, and evidently they were fearful of these failures. He supposed the fact was that they, as an Institute, wanted to investigate these failures, and to lay down such rules for reinforced concrete construction as should practically ensure a building being able to avoid the various causes of failure mentioned by Mr. Serraillier, and that was a work which the Concrete Institute ought to do, and was, he thought, doing. When they had done that and were in a position to say that, provided their rules were followed, they could guarantee a life of thirty years or more to a reinforced concrete structure, then he thought the Local Government Board, and all the other authorities, would have to recognise the full value and usefulness of this new type of construction.


PIER 76
2'-5¼
2'-5¼
BASEMENT FLOOR LEVEL [85·64]
2nd BASEMENT FLOOR LEVEL [71·14]
6'-5½
2'-6¾
4½
¾
8'-0¼
8'-0
¾
4½
16'-10¾

SECTION 76B-76B

SELFRIDGE STORES, OXFORD STREET, LONDON.



SELFRIDGE STORES, OXFORD STREET, LONDON: PLAN OF GRILLAGE AT SECTION 76B—76B.

Mr. A. ALBAN SCOTT said it seemed to be an entirely wrong principle to call a man a reinforced concrete specialist who did anything else but design the structure. A firm which had a patent on the market could not possibly hold that absolutely unbiassed position which a specialist should hold.

Mr. E. FIANDER ETCHELLS said the Concrete Institute should strive to combat the esoteric opinion that there were two kinds of natural law in the physical universe, one kind for reinforced concrete, and the other for all other materials. On reading some of the circulars sent round, one would think that reinforced concrete, not being in existence when the laws of nature were framed, was not included therein, or was specially exempted therefrom. Mr. Serraillier, in reference to his statement that in France a specialist who designed a faulty building was put in prison, said that this was a knotty point which might be discussed by the Concrete Institute. In this connection, he (Mr. Etchells) suggested, as an additional inducement to rembership of the Concrete Institute or its Council, that the Institute should go bail for such unfortunate designers. If the building authority were to plead for the enactment of imprisonment on failures, he feared there would be a great outcry, and yet in the oldest school of laws in the world, laws older than the Decalogue, in the Code of the Kingdom of Babylon more than 4,000 years ago, he read that "if a builder has built a house for a man and his work is not strong, and if the house he has built falls in and kills the householder, that builder shall be slain." Doubtless that law tended to ensure sound construction, but to-day more than ever before it was the man who cut things fine and took the most risks who would usually got the most orders. The contractor who thought to-day of strength alone, not counting the cost, would most probably end in the bankruptcy court. They all knew how often an order was missed because some person less scrupulous or more daring had cut down his thicknesses, and thus obtained the coveted order. Unrestricted competition did not make for sound construction and fair prices. In that connection he urged that the Concrete Institute should take up the suggestion given in the paper as to whether the regulations of the R.I.B.A. Reinforced Concrete Committee should not be adopted by this Institute, with the necessary simplifications and amendments. If they could get rules with such support as to obtain national acceptance, they would do much to restrain uneven and unfair competition. There was another advantage in obtaining a general adoption of an accepted code, and that was to reduce the cost of preliminary drawings submitted with tenders, because it should be sufficient to examine the general lines of the design if all the designs submitted were based on the stresses of the R.I.B.A. Report, as amended. He noticed that the author of the paper had invited their attention to the dangers of "hustle" in the preparation of drawings for reinforced concrete work, and he would point out that "hustle" was very much greater in the actual execution of work on the site.

Mr. G. C. WORKMAN thought that the specialists, who were destined to disappear some day or other, were suffering very much from a want of data when asked to supply a design. Very often they were not given the superload, and he knew they were in competition with other firms who were probably not given the superloads either, and they were generally left to guess them. They might, of course, guess 1 or 2cwt., and naturally the price of the various designs differed. Another thing they suffered from very much was that they were not given the bearing capacity of the ground. He wished to take this opportunity of telling architects how absolutely necessary it was to give these proper data. They could not build a footing without knowing the bearing capacity of the ground. If they were not told these things, how were they going to work? They had to guess them. They might guess a capacity of 2 tons to the square foot, but another specialist might guess something much higher, with the result, of course, that there was going to be a greater difference in the ultimate cost. With regard to the difference in the working stresses of the materials, that he thought was a most serious point, and he could not say too much to make them feel how serious it was. They were not all working on the same stresses, and he thought it was only fair to those who were, like themselves, working under the Rules of the Committee which had been by the R.I.B.A., that when they were working under those Rules in competition, all the others ought also to work under them. Instead of that, he did not think that was actually the case. As to the factor of safety, this was a most vital question. They had been asked to provide for a factor of safety of 5 in certain cases. They thought 3½ was quite sufficient. On the Continent a well-known specialist never thought of giving more than 3½ or 4; it simply meant a waste of materials to give more than that. With Mr. Serraillier, he did not think some people realised that the factor of safety was a proportion of the breaking strain. Concerning the preparation of designs, this was also a very important point. Mr. Serraillier thought that far too many details were required from specialists, and there was no doubt about that, but he could quite sympathise with the architect. There was such a diversity of systems and methods of placing bars in a beam, for instance, that he could quite sympathise with the architect who said he must have some kind of idea what the system was going to be, inasmuch as nowadays all architects were taking a great interest in reinforced concrete, and were quite capable of checking if such-and-such a system would be efficacious or not. Therefore, he thought that, although in preparing designs a simple sketch should be given, at the same time he thought it was advisable to give a cross-section, and a longitudinal section of the beam. With regard to "hurry," they were often asked to do some impossible work. They had to alter the architect's plans very often; they had to put beams in the proper position, because the architect had not put them there, not being quite aware of where they ought to go. It simply came to this, that of course the architects knew exactly where a beam ought to be, but they did not always know where it was most economical to place it. They were asked to hurry tremendously, and of course they were bound to make mistakes, and to suffer in consequence, but there was one thing that was a source of great distress to specialists, and that was that not only were they bound to suffer for a mistake in their designs, but they were responsible also for the quantities, and that of course was a thing that was a cause of great trouble between the contractor, the specialist, and the architect. With regard to failures, Mr. Serraillier said that in France they put the engineer in prison; that was, of course, in cases of fatal accidents, but he thought in England the same thing would happen. He thought if there was a fatal accident in England the engineer would go to gaol, and that was a strong reason why they should have definite rules which should be recognised in an official manner. He had said before that the rules of the British Committee should be adopted. Everybody said that, but was anything being done to make them adopted? He did not know what the Concrete Institute was doing in the matter. He was unable to attend the last meeting of the Council, but he thought some steps ought to be taken to try and impress on the authorities the necessity of getting these rules once and for all recognised, because there was no doubt about it that if there was a failure causing a death, some rules would have to be put forward, and he thought there was no doubt that the rules of the British Committee would be adopted, there being no others that he knew of. He wanted to say a word about Local Government Board loans. In England they could only get a period of 15 years for the repayment of loans. M. Coignet had pointed out that in France there were buildings in reinforced concrete which he himself had put up, which were over 30 years old, and were doing very well.

Mr. J. MUNRO said that he was in complete accord with most of Mr. Serraillier's paper, but there were one or two points he should like to speak about. With regard to responsibility, he held that that should be absolutely borne by the specialist, no matter whether he designed or carried out the work, because the architect in these days of stress and hustle had not got too much time in which to indulge in responsibilities or accept a divided responsibility. Of course, in years to come he expected the architect would have the Alpha and Omega of reinforced design at his finger-ends, and then he would be able to accept what at the present time he (Mr. Munro) would be very loath to load him with, i.e., responsibility. With regard to the testing of material, he thought that was all to the good. They ought to make good all defects, and ought to be responsible for quantities as well. It seemed to him that if the architect gave them work to design and carry out, it ought to be undertaken in the same spirit as a builder would undertake it. There should not be a too divided responsibility. There was one question that Mr. Serraillier had left out, and that was a question of payment. He thought that in every specification, an estimate that was given by a firm of concrete people ought to include a specific sum, which should be a general one, for the builder. The builder was entitled to a sum because he had lots of little things to see to, and a lot of little responsibilities, and it would be only fair to him to have a little return. He thought 5 per cent. ought to be added on. With regard to contracts, if the amount of the contract for reinforced work was not a serious one, he saw no reason why it should not be amalgamated in the general bill, and the building contractor pay the specialist; but if the work was of serious import, he agreed with Mr. Serraillier that the contract should be made direct. There might be some agreement made in respect of the Concrete Institute with the R.I.B.A. as to the stress and strain, and in agreements as between the general contractor and the specialist there ought to be some step taken to obviate unnecessary or harsh clauses in the agreements. The contractor had the control of the building, and if he chose to be arbitrary, he could order the specialist off the job.

Mr. M. KAHN said that Mr. Serraillier had made a very common error in crediting the Continent with being the cradle of reinforced concrete. As a matter of fact, an Englishman was using reinforced concrete at a time when M. Monier was still a small small boy in knickers. It had often been proved that reinforced concrete was not born on the Continent, but in that cradle which was rocked between the Irish and the North Seas. He heartily confirmed the contentions of Mr. Serraillier with respect to failures; an accident must result either from faulty construction or from faulty labour and material. The question of responsibility was, he thought, more a trade problem than a professional problem. With regard to the expense incurred in the preparation of drawings, which Mr. Serraillier stated sometimes amounted to as much as £100, he could give several instances where the expense had involved more than £100. It was to be regretted that so many bad schemes were thrown on to the specialist to deal with; schemes which were never intended by the architect to materialise. What Mr. Serraillier stated regarding designs of competing firms being passed round, was only too true, and he had often thought such a procedure was just cause for legal action. Some of the points raised in the paper should not be treated professionally by the Concrete Institute, but in a professional manner by the co-operation of the specialists; and whilst much good would result if all Mr. Serraillier's suggestions were carried out, it was almost hopeless to expect that all of them would ever come into effect.

Professor HENRY ADAMS said the greater part of the paper consisted of statements that could not be gainsaid, but there were points in it, he thought, which were open to question. The chief point of the paper appeared to be the supremacy of the specialist contractor, who should combine in himself the designer, constructor, and supervisor. He demurred to that. It was like combining the cashier and book-keeper, or the auditor and treasurer, and he thought it was generally agreed that that was not a workable or satisfactory arrangement. The author spoke of the engineer and architect as being liable to make mistakes, with possibly a loss of reputation, but no pecuniary loss. As he took it, the law stood this way —that a professional man was not liable for errors of judgment, but he was liable for negligence, and that was the distinction between the cases where an engineer or architect was or was not responsible. With regard to the factor of safety, he often heard of questions on that subject. It was something like the dividends on investments on the Stock Exchange; they might get a big dividend or a small dividend, but it all averaged out to something under 5 per cent. In factors of safety, they might say that they gave a factor of 4, 5, or 3, but that factor was not a definite, fixed amount. They might call it 5 when they were really only getting 3. The factor of safety was a figure that should cover all contingencies; those contingencies varied in every case, and it was not as if they had perfect material, perfect workmanship, and perfect design, and knew exactly what they were getting, so that a factor of safety at 4 meant a factor of safety at 4.

A Member: It is a factor of ignorance.

Professor ADAMS, continuing, said that if they could rely on what they were doing, they could be satisfied with a factor of safety of about 2½. They must have at least 2 to keep within the limit of elasticity, but 2½ would probably be safe. It was because of the unknown matter that they had to make a greater allowance. The Regulations of the British Reinforced Concrete Committee had been referred to. He thought that was a very good thing for the Concrete Institute to consider, and he hoped that they would then simplify the formulæ, and take great care that contingencies were properly allowed for. In all formulæ of that kind there was a tendency to be too theoretical, to consider that the work was perfect, whereas in practice they knew that they could not always rely upon the supervision the work would get; they could not rely upon the men, and not always on the material, and so some of these formulæ were too finely cut for practical use. With regard to failures, on the Chinese Railways, when railways were first formed there and an accident occurred, the contractors were put in prison, but he thought, in the case of reinforced concrete, so far as his experience went, it was the workmanship that was more often in fault than the design, and therefore the heads of the departments were safe as regarded penalties.

Mr. HERBERT E. BROOKS said there was a reference in the paper to the question of Local Government Board action on the loan matter, and remembering what the ways of Government Departments were, it had occurred to him that they might possibly have a better chance of securing a result if they were to ask the Local Government Board themselves to select and appoint a committee to deal with this question. They knew what a strong representation was made not very long ago on this very question of a committee, and how exceedingly obdurate the President of the Local Government Board was in the matter. Mr. Burns was quite alive to what had been going on, and he knew the object with which the questions in the House of Commons were put. The Local Government Board, he said, was not satisfied, and they must have this information concerning the durability of these structures before they would listen to any lengthening of the terms they had hitherto been willing to agree to. It had occurred to him (Mr. Brooks) that possibly the line of lesser resistance might be to invite the Local Government Board itself to select the committee.

Mr. JOCELYN remarked that if the Concrete Institute were to combine with the R.I.B.A. to amend the rules for designing reinforced concrete which all specialists would work on, could they depend on the specialists working on those amended rules? Up to the present, in ordinary steel construction, he did not think there was an engineer who would be dictated to by any committee. Could they, therefore, rely on the concrete expert being dictated to?

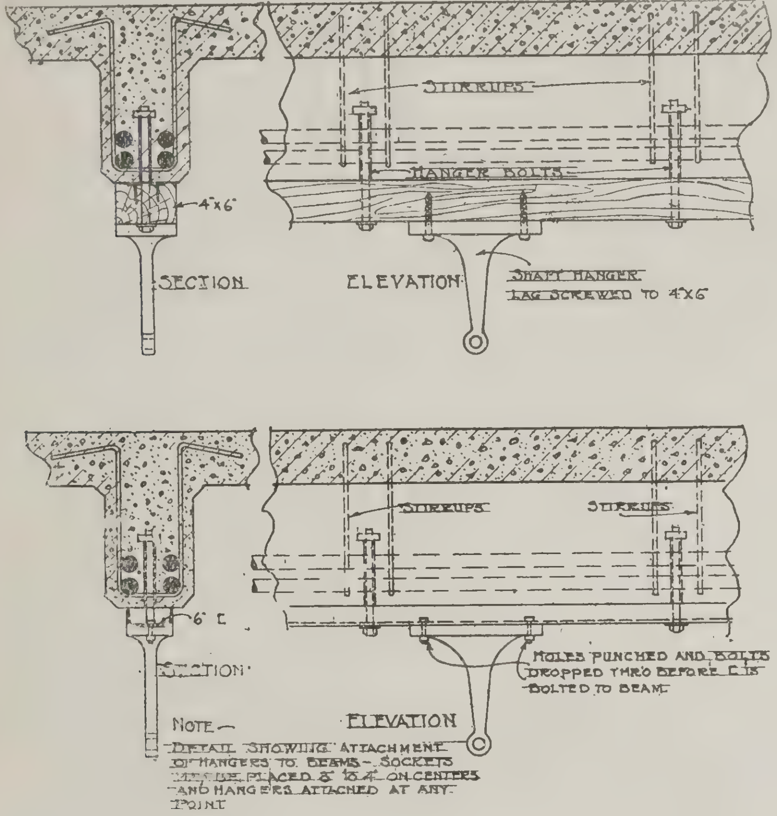
The CHAIRMAN said he would like to join with those who had spoken in thanking Mr. Serraillier on behalf of the Concrete Institute, for the very excellent paper which he had put before them. There were, as they all knew, a very great number of abuses at the present moment in the execution and in the design of reinforced concrete work, and in the practice, if he might so term it, for practice was a word which perhaps covered the subject matter of Mr. Serraillier's paper best. He agreed, as he had said before, that they would disappear gradually as architects and engineers because more acquainted with the subject of reinforced concrete, both its advantages and its limitations, and although he quite saw what Mr. Wentworth-Shields was driving at when he spoke of the possible extinction of the reinforced concrete specialist, he did not quite share those views in the light in which they were put forward. He was under the impression that it would simply be a change in procedure. The architect would design more carefully; he would specify more carefully as he understood more about the subject; the younger generation would know the subject thoroughly in about ten years' time, and that was about the time when they must look forward to a more general practice in reinforced concrete. A specialist would get to read good specifications, and those who sold special articles, like bars, would make those bars to specific specifications, and the result would be very much the same as what they were having now with steel-frame construction, that there would be a practice based very much, as it was at present in steel-work, on standards, not so much, perhaps, on legislation as on rules, but on standards arrived at after joint consultation between the industries concerned. The architect would know what he wanted in detail, the engineer likewise, and the specialist would really be having rather an easy time, or he would become a constructor or contractor more than a designer, and it would not be expected of him to design to the extent he had to do now in order to get work at all. They were all very thankful to the specialist that he should have done such a lot of pioneer work, but if they came to think of it closely, he had done a great deal of work that the architect or engineer ought to have done of his own accord. Regarding the point as to failures, he believed that the precise publicity of the causes of failure would be of advantage to the development of reinforced concrete. The unknown was always worse than the known, and to know precisely what were the very few points in which reinforced concrete had its dangers, and to know what was to be avoided, meant that they would not have any failures, and that those precautions would be taken that were really necessary. They had heard something said about the legal aspect of these questions. France had the "Code Napoleon," and some other countries also, and it could be precisely stated that the French architect, builder, or contractor did go to prison, and had to prove his innocence, while at the very most they in this country could have a case of manslaughter, which did not immediately assume guilt. The whole principle of the law was that the moment a building was down, the French responsible official, were he architect or contractor, was assumed to be the guilty party, and he had great difficulty to prove that he was innocent. Another point brought out on the legal questions was unfair competition. There were laws in two countries—Germany and Austria—where unfair competition was a criminal offence, and it not only affected the contractor in building construction, but it affected everything practically that was sold or was erected or constructed in those particular countries. Then there was a technical or trade question brought forward, viz., the question of discounts and builders' payments. He sympathised with the view put forward by Mr. Munro. A contractor should receive a specific sum, preferably about 5 per cent. or 7½ per cent., for the trouble he had to take in assisting and making room for the specialist contractor. The fixed sum should be provided, and personally he had always provided 5 per cent. in contracts for the general contractor where a specialist contractor was also employed. But he had also found in two cases that the builders had, nevertheless, tried to make a little extra out of the specialists in what they called a "cash discount." The cash discount was anything between 2½ per cent. and 10 per cent., and however they might object to it, it was regrettable to state that there were cases where specialists simply agreed to make this extra payment. He could only advise specialists in such cases to go straight to the architect, and state their case. He had very soon had a stop put to it by having payment made direct from the client to the specialist, and the amount deducted from the general contractor's bill. He was much pleased to hear the proposal made by Mr. Brooks, that a suggestion might go from the Concrete Institute to the Local Government Board that a departmental or some such committee of inquiry should be held in the matter of loans for reinforced concrete work. He thought this would do a great deal of good, particularly at the present moment, when there were a number of proposals being brought forward by different municipalities with a view to obtaining powers to allow reinforced concrete buildings in their districts. In conclusion, he again thanked Mr. Serraillier for his paper.

Mr. L. SERRAILLIER, replying on the discussion, said his paper had not provoked as much criticism as he anticipated. He knew there was one gentleman in the room who was thirsting for his blood, and he wished he had spoken. All the specialist representatives were of the same opinion, and the architects and engineers were of another opinion; that was to be anticipated. His paper was not a bitter cry of the specialist, but simply an indication of the difficulties they had to encounter at this moment, and which they would overcome. They had not any intention whatever of disappearing. On the contrary, they had come to stay, and they were doing very well, all the same, with all these difficulties, which he thought would be less when the situation was better understood. He thought that was the reason why things were so difficult at present. He did not see why they should disappear. They were told that gas would disappear when electricity came in, but it had not disappeared at all. As to the question of failures, Mr. Workman told them of structures in France over thirty years old, and he thought that ought to be a sufficient indication that they could stand. As to the question of discount for the builders, and the suggestion that each specification should include, say, 5 per cent., he thought that was all right if some understanding could be arrived at beforehand about it. He was glad to hear it was an Englishman who first brought in reinforced concrete. When he said that the Continent was the cradle of reinforced concrete, he meant that the material was first developed on the Continent. Mr. Brooks had suggested that the Local Government Board should be approached by the Institute to appoint a committee themselves with regard to the question of loans, but he was afraid the President of the Board was entirely in the hands of his technical advisers; that was where the difficulty lay.

The hon. treasurer announced that the next meeting of the Institute would probably take place on March 18th.

METHODS OF ATTACHING SHAFTING AND MACHINERY IN REINFORCED CONCRETE BUILDINGS.

The manner of attaching shaft hangers, pipes, and machinery to beams and floors in a factory or mill building of the reinforced concrete type is a detail of considerable importance, so much so in fact, that often if no satisfactory scheme is explained to the owner he will not consider the use of reinforced concrete beams in his proposed building. In the ordinary mill constructed factory with wooden or steel floor beams there is no special difficulty in attaching hangers for shafting and pipes or fastening machinery to the beams and floors in any desired location without any previous plans necessary and at a minimum cost. But in a concrete building the conditions are entirely different, and it is much better to adopt some scheme for the installation of the machinery, piping, etc., before the building is constructed if we wish to obtain the best results in all respects.


STIRRUPS
HANGER BOLTS
4"x6"
SECTION
ELEVATION
SHAFT HANGER LAG SCREWED TO 4"X6"
STIRRUPS
STIRRUPS
6" [
SECTION
HOLES PUNCHED AND BOLTS DROPPED THRO BEFORE [IS BOLTED TO BEAM
ELEVATION
NOTE —
DETAIL SHOWING ATTACHMENT OF HANGERS TO BEAMS – SOCKETS MAY BE PLACED 3' TO 4' ON CENTERS AND HANGERS ATTACHED AT ANY POINT

Fig, 1.

Shaft Hanger Supports.

Appliances for conveniently supporting hangers for pipes and shafting and for supporting motors and other machinery from the beams and ceiling probably require more previous planning and careful selection than are necessary for other phases of this subject. The method recommended by the engineer and adopted for use with this type of building should be one designed to best meet all the requirements so far as can be known of the building and its later equipment. It should be inexpensive, compact, and simple in form, with not too many separate parts, and as flexible as possible to accommodate future changes in the line of shafting, additions, or improved machinery, etc.

We have here collected a few different systems which are used by specialists in concrete construction.

One of the most common methods employed is to attach a hard pine timber to the under side of the concrete beam. This may be in any desired length, to which the shaft hangers are bolted or lag-screwed in their exact position as is shown in Fig. 1. The timber can be secured to the bottom of the beams by bolts built into the concrete about 4ft. on centers, with a projecting threaded end and nut below, or by the use of sockets, inserts, sleeves, and washer nuts imbedded in the concrete, into which the timber pieces are afterwards fastened. If the bolts are used, care should be taken to set and keep them vertical, also have them thoroughly anchored into the upper part of the beams.

Fig. 2 illustrates the long bolts with saddles and check nuts to hold them in position, which is quite essential. It is seldom that all the bolts projecting from the bottom of the beam are made use of, and where not used they present an unsightly appearance, hence sockets or sleeves and washer nuts are often preferable. These can be kept in correct position with less trouble, are about the same cost, and make a neater looking job.

In Fig. 3 we have shown a special socket. This device serves also as a support and spacer for the beam rods, keeping them all properly spaced from each other and from the beam box or centering. Fig. 4 represents a socket sometimes used. It is made of a short piece of wrought iron pipe tapped out on the inside to receive a lag screw or bolt. Holes are drilled near the top, through which a ¼in. rod or stirrup is placed which should extend well up into the concrete. The socket itself is temporarily held in position before the concrete is placed by setting it over a wooden plug nailed to the centering. The stirrups are not easily kept in an upright position. For this reason this socket is not altogether satisfactory.

The socket shown in Fig. 5 is made of cast or malleable iron with a flanged top, which serves to anchor it into the concrete. A vertical stirrup should be used with this socket if it is placed in a beam and is intended to support much load. If used as shown in the sketch it also acts as a support for the rods.

Another special socket shown in Fig. 6 can be made use of for almost all supports in reinforced concrete work. It is a malleable casting made in many sizes. can be anchored as securely in the concrete as may be necessary by the use of stirrups, and is more or less adjustable.

Another form of adjustable sockets or inserts for use in beams, principally, is shown in Fig. 7. These castings are made in convenient lengths, and are set on the forms for centering before the concrete is placed. The slot in the bottom makes it possible to place hangers or bolts at any desired location along the length of the insert.

Fig. 1 illustrates the use of large washer

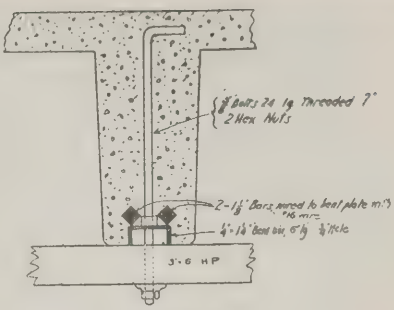

⅝" Bolts 24 lg Threaded 7" 2 Hex Nuts
2-1⅛" Bars wired to bent plate m.s. ⅛ mm
¼"×1¼" Bent bar, 6" lg ½" Hole
3"·6 HP

Fig. 2.

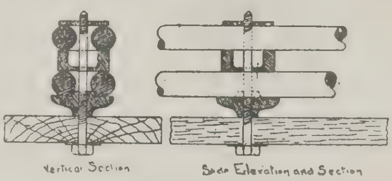


Fig. 3.

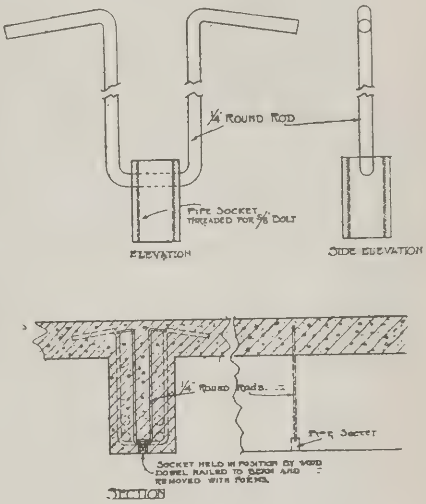

¼" ROUND ROD
PIPE SOCKET THREADED FOR ⅝" BOLT
ELEVATION
SIDE ELEVATION
¼" Round Rods.
Pipe Socket
SOCKET HELD IN POSITION BY WOOD DOWEL NAILED TO BEAM AND REMOVED WITH FORMS
SECTION

Fig. 4.

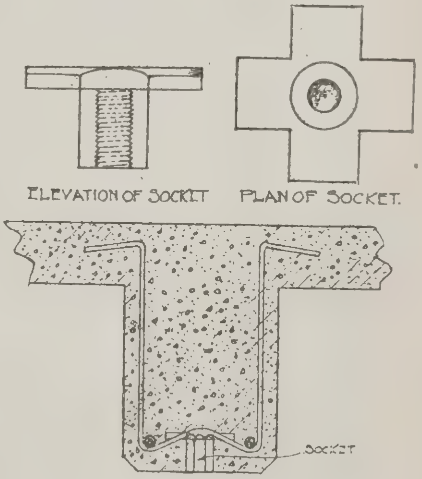


Fig. 5.

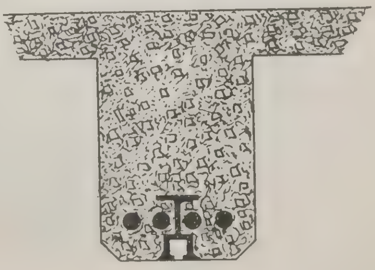


Fig. 6

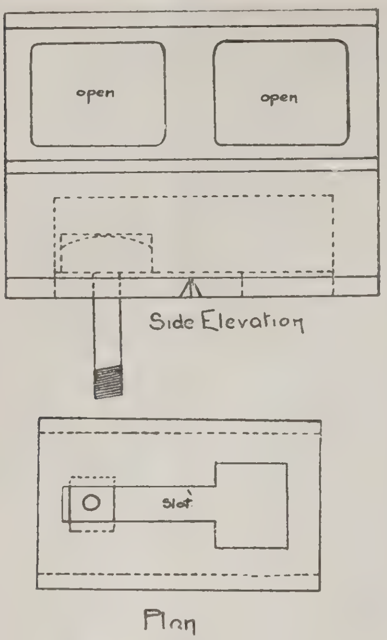


Fig. 7.

nuts imbedded in the upper part of the concrete beam, usually about 4ft. on centers. These are temporarily held in position by a thin iron tube resting on the centering and by a bolt projecting through the hole in the bottom of the beam box. The washer nut is tightened down to the top of the tube which secures it firmly in an upright position. When the beam boxes or centering are taken down the bolts are easily unscrewed from the nut, leaving a clean passage through the concrete to the nut above, to which can be attached timber or iron stringers, on to which the shaft hangers can be fastened in the ordinary manner.

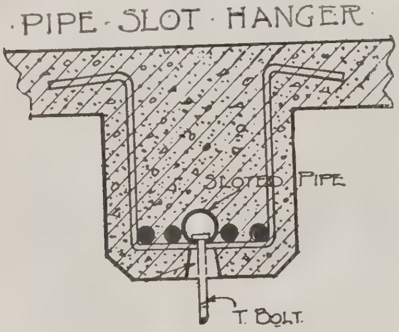


Fig. 8.

Figs. 8 and 9 illustrate two other methods used for attaching shaft hangers and machinery to beams. With either of these schemes the shaft hangers or other fittings can be bolted or clamped to the concrete structure without the use of wood timbers or iron bolsters, if so desired. The method shown in Fig. 9 is also serviceable.

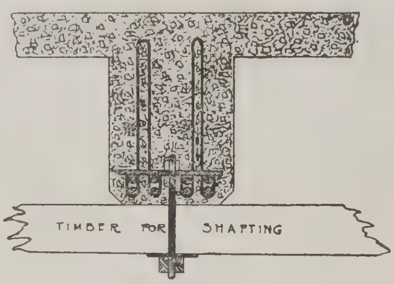


FIG. 10.

Another method is suggested in Fig. 10, which can be made a strong and serviceable support for motors and machinery.

Other systems which have been used quite extensively are illustrated in Figs. 11 and 12. When a bolt is used through the beam near the top a metal sleeve with a wooden core is concreted around to form the hole. These openings also permit the passage of pipes and wires. Large holes left in certain parts of beams and girders might cause weakness in the compressive side of the member. If so, an iron pipe sleeve of sufficient thickness should be used. It is rather difficult to always locate the holes through the beams during construction to conform exactly with future changes. Therefore, the system of using the hooked hanger bolt inside the beam is more satisfactory. If the holes for the hook bolts are cut with a pneumatic drill it can be done at a nominal cost.

Wires and Sprinkler Pipe Supports.

Blocks of wood are often set in the under side of concrete slabs to which are fastened wires and small sized pipes and wire conduits. This is not considered a suitable or permanent support. It is much better practice to use either expansion bolts or locate and place adjustable sockets and inserts in the concrete work. Often the conduits for wires are placed on the centering and imbedded in the concrete slabs. If the pipes are not too large and are located with due regard to the reinforcing metal, there is no serious objection to this method. Piping for sprinklers is generally planned before the concrete work is started. It is therefore a simple matter to place inserts or sockets where needed in the concrete work, to which the pipes can be readily attached later on.

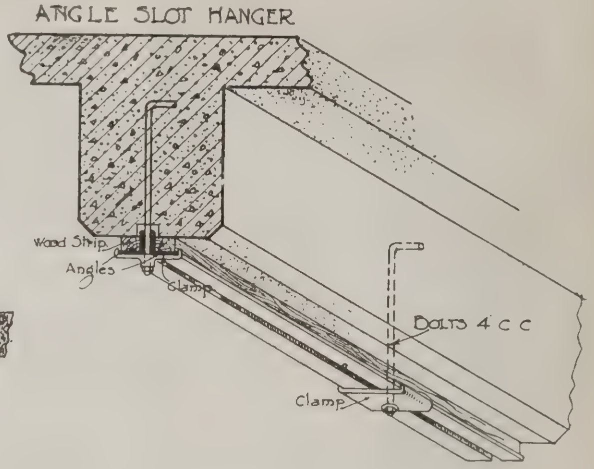


Fig. 9.

Machinery Fastenings.

Large machines with heavy bases setting on the floor seldom require any special fastenings. It is usually sufficient to thoroughly grout with Portland cement mortar the base of the machine to the concrete floor. Small machines can be fastened directly to the concrete by expansion bolts or similar methods after the floors are concreted, the cost of drilling for these fastenings being a small item of expense. Sometimes, however, it may be necessary to bolt through the floor in order to hold certain machines rigidly. If through bolts are required the holes should, if possible, be located before the floor is concreted; otherwise, in cutting these holes through the floor reinforcing bars are liable to be encountered, which would cause more or less difficulty and might lead to serious trouble if cut off. In most cases machinery runs better and lasts longer if placed on solid foundations, and reinforced concrete floors are admirably adapted for machine shops. There are, however, exceptional cases where machines seem to require more or less "give" on their basis in order to work and endure most satisfactorily. This is particularly true with certain textile machinery, and where a cushion is required a wood floor can be laid, or wooden timbers or bolsters can be fastened to the concrete flooring. It has also been suggested to use sheet cork, linoleum, or compressed felt under the base of machines in order to give elasticity of movement, lessen the noise of running machinery, and eliminate vibration as far as possible.

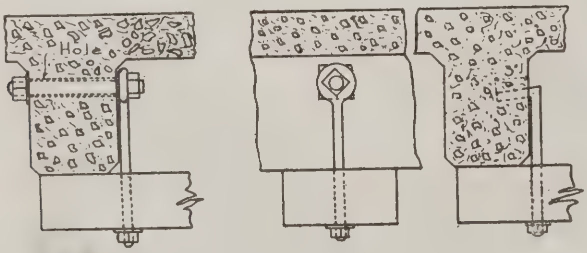


Fig. 11.

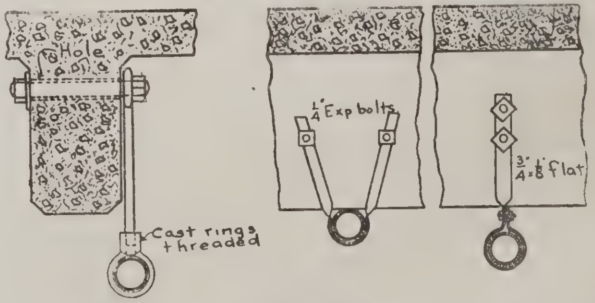


Fig. 12.

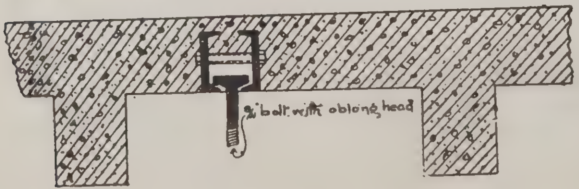


Fig. 13,

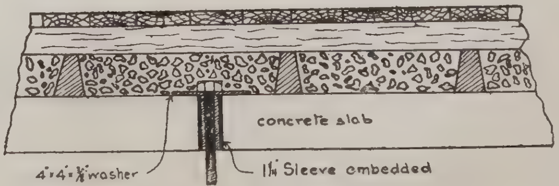


Fig. 14.

Federation News.

REDDITCH ASSOCIATION.

Secretary: H. Huins.

The third annual dinner of Redditch Master Builders' Association was held at the Unicorn Hotel, Redditch, on Thursday, February 18th, Mr. F. C. Huins, president, in the chair. About 60 gentlemen were present. After the usual loyal toast, proposed by the president, Alderman G. W. Hobson proposed "The Redditch Master Builders' Association," whose right to combine for the defence and advancement of their interests he maintained in a vigorous and pointed speech. The president having replied, Mr. Gross offered "The Town and Trade of Redditch" in a speech that revealed an intimate acquaintance with the past history and current topics relating to his subject; and all hearts warmed to him when he incidentally exclaimed: "I love to hear the tinkle of the trowel," and expressed a fervent hope that the time was at hand when this gladsome music would be less scarce than it had been for some time past. Mr. T. Huins, in responding, dealt authoritatively with local questions of burning interest. "The Local Governing Bodies," proposed by Mr. A. G. Avery, was replied to by Messrs. A. Brazier and H. J. Surman. "Our Visitors," proposed by Mr. George Huxley, was replied to by Messrs. J. Brazier and H. M. Grant. Mr. H. Holloway gave "The Architects and Surveyors," on whose behalf Messrs. John Johnson, A. J. Dickinson, and George Neason made exceedingly terse replies, the first-named gentleman taking a cheerily optimistic view of the future of the trade. "The President and Vice-President" were toasted in a singularly able speech by Mr. F. Amphlet, who, after setting forth neatly and concisely the advantages of collective insurance under a non-Tariff scheme, against workmen's compensation claims, adroitly drew a striking parallel between, on the one hand, combination for equitable insurance against accidents under the Act, and, on the other, insurance against labour disputes. The mere existence of the federated associations, he pointed out, might be regarded as insurance for the protection of the employers' interests. Just as a standing army and an efficient navy, or an efficient police system, was a kind of insurance against war or crime, even so an organisation was a safeguard against aggression and injustice, and was in this respect well worth the energy and money expended in maintaining it in a state of efficiency. He also strongly urged the association to do all in its power to promote the intertrading rule. It was a clever and telling speech, delivered with easy mastery of style. Mr. F. C. Huins and Mr. H. J. Surman replied. The energy and ability of "The Secretary" having been highly praised by Mr. F. Newbould, Mr. H. Huins made a brief and modest reply. Proposing "The Press," Mr. A. E. Edkins tempered a generous eulogy with regret that, with all its noble traditions, the Press was not entirely innocent of a tendency to depravity. It did not sufficiently concern itself with the things that really mattered—science, commerce, industry—but gave far too much attention to trivialities, and especially it accorded too much space to the unedifying details of divorce cases. In responding, Mr. J. F. McRae, of the editorial staff of the "Builders' Journal," acknowledged regretfully the truth of Mr. Edkin's strictures. In fact, he said, Mr. Edkins had made out a strong case for an extensive application of the whitewash brush; and the stuff used would have to be genuine sanitary washable distemper; but even then the ineradicable "yellow" tint would probably show through. The speaker believed that there was much truth in the saying that the public had the Press it deserved; and he also believed that in spite of all its faults, the British Press was absolutely the finest in the world, and perhaps, its greatest virtue was that it was incorruptible. But he had the good fortune to be connected with a section of the Press that was free from all taint of uncleanness. He claimed that the technical and industrial Press was doing excellent and indispensable work, and was on the whole doing it very well indeed. As to the journal that he had on that occasion the honour to represent, the modesty for which journalists are notorious forbade his saying very much. He would prefer the journal to speak for itself. It had won golden opinions and held a recognised position, and enjoyed a high reputation as one of the very best of trade journals. He could hardly refrain, therefore, from congratulating the Federation on its good fortune in having adopted so excellent a medium for the furtherance of its aims and interests. The speaker's presence among them—he had that day come all the way from London—was an evidence of the desire of the managers of the journal to carry out their part of the compact cordially, sympathetically, and ungrudingly. He had no doubt that the feeling would be heartily reciprocated, and he felt that there was no need to urge his hearers to give hearty support to the journal of their adoption, because, as business men, they would recognise that it was greatly to their interest to do so, the journal possessing a double value to members of the Federation. Mr. H. Guise, editor of the Redditch "Indicator," whose name also was coupled with the toast, dealt trenchantly and humorously with local affairs. Mr. Guise contributed several songs, most artistically rendered, to the excellent concert that lent variety to a thoroughly enjoyable evening.

WEST BROMWICH AND DISTRICT ASSOCIATION.

Secretary: Tom Dallow.

The annual meeting of the West Bromwich and District Master Builders' Association was held on Monday evening, January 25th. Mr. J. Bott, president, was in the chair, and in addition nine members were present.

The counter-notices from the operatives of the stonemasons, pasterers, carpenters, bricklayers, and general labourers, were read and consideed, but it was unanimously decided not to take any action in the matter at present, but to have a special meeting to consider further what course to take.

The question of adopting the inter-trading rule was further considered, but at present nothing definite has been decided.

It was unanimously decided that the annual dinner should be held on Tuesday evening, February 23rd, at the Dartmouth Hotel, West Bromwich, and the secretary, together with a committee, was instructed to carry out the arrangements for same.

The following officers for the ensuing year were appointed:— President, Mr. J. Bott; vice-president, Mr. William Jackson; treasurer, Mr. James Sadler; secretary, Mr. Tom Dallow. All the members present were entertained to dinner by the president.

An extension of the secondary schools has just been commenced by Mr. George Jones, and, should the Council proceed with the new refuse destructor and the new schools in the Hill Toy district, the outlook for the summer would be brighter. Mr. William Jackson has secured the contract for new schools at Warley, in the Oldbury district, and it is expected that new schools in Langley and Rounds Green will shortly be commenced.

WAKEFIELD ASSOCIATION.

Secretary: J. Beaumont.

The Wakefield and District Master Builders' Association held their eleventh annual dinner on February 11th, at the Strafford Arms Hotel, Wakefield. The president (Mr. Tom Lee) was supported by the mayor (Alderman Hudson), Mr. W. R. Thompson (Dewsbury), Mr. W. J. Ledgard (Leeds), and Mr. J. Davidson (Leeds), president, hon. treasurer, and secretary of the Yorkshire Federation of Building Trade Employers, Mr. S. Coop, president of the Dewsbury Master Builders' Association, Alderman Simpson, J.P., Alderman Judge, Alderman Atkinson, Mr. A. E. Greaves (hon. solicitor), Mr. A. S. Nicholson, and Mr. F. B. Ellison (architects), and Messrs. H. Fallas, E. A. Elvey, G. Crook, J. Pashley, J. W. Bramham, F. Clark, R. L. Leake, D. F. Parker, J. W. Sanderson, T. E. Senior, and others, the number present being 45.

Mr. A. E. Greaves proposed "The Mayor and Corporation," and Alderman Simpson responded.

Alderman Judge, in proposing "The Yorkshire Federation of Building Trade Employers," spoke of the benefits the Wakefied Association derived from being affiliated to the Yorkshire Association. As far as the Yorkshire Federation was concerned, they would not find that they had recommended that wages should be lower: they believed for a fair day's work a fair day's wage should be given. Speaking of the rising generation, Alderman Judge said it seemed as if they did not want to dirty their hands, but desired some occupation where they could go with a clean collar on: it was no use such young men entering the building trade.—Mr. W. R. Thompson (Dewsbury), responding, gave a résumé of the Federation's work during the past year. Although they had suffered from trade depression, it was very creditable to the master builders of Yorkshire that they had made no attempt to reduce the wages. Speaking of the prospects, he said the point they had to consider was, how could they strengthen their local association? He suggested that papers on practical subjects be read, and appealed for more unity in their work.—Mr. J. Davidson (Leeds) also responded, and referred to the assistance the Federation had received from the advice given by representatives from the local association.—Mr. W. T. Ledgard (Leeds) proposed "Success to the Wakefield and District Master Builders' Association." In responding, Mr. Tom Lee spoke of the agreeable manner in which the builders and local architects worked together. —Mr. H. Fallas also responded.

In proposing the toast of "The Architects," Alderman Atkinson spoke at length upon the state of the building trade in the city, and the excellent relations which existed between the architects and the builders.—Mr. A. S. Nicholson and Mr. F. B. Ellison also responded.

On the call of the president, the health of the mayor, who arrived late, was heartily drunk, and the mayor suitably responded.

NOTTINGHAM ASSOCIATION.

Secretary: W. J. Barton, F.C.I.S.

At the eighteenth annual general meeting of the Nottingham Association, Mr. Wm. Crane (vice-president) in the chair, a printed summary of the cash account for 1908 was placed in the hands of members, and on the proposition of Mr. Quarton, seconded by Mr. Fish, it was resolved that the same be received and adopted.

The hon. secretary (Mr. Jas. Wright) gave a very interesting account of the work accomplished by the Association and by the National Federation during the past year, and a hearty vote of thanks was accorded to Mr. Wright for his valuable services to the association, and to the trade generally.

The election of officers and committees for 1909 then took place, the following officers being appointed:—President, Mr. J. W. Woodsend; vice-president, Mr. Wm. Crane; treasurer, Mr. J. W. Woodsend; hon. secretary, Mr. Jas. Wright; auditor, Mr. F. Quarton.

In addition to the general, finance, and separate trades committees, an executive committee was formed from the members of the general committee, consisting of nine members, to deal with special matters as they arise, thus obviating the necessity of forming sub-committees from time to time.

Messrs. Quarton and Thompson were elected the association's representative of the Midland Centre.

Mr. H. R. Thompson then gave an instructive paper on the inter-trading rule, and a vote of thanks was accorded to him for the same. This question was then referred to the Executive Committee for further consideration, when the matter was to be again laid before a general meeting.

The chairman explained to the meeting that in some towns it had been arranged for the operatives to start work at 8 a.m. all the year round, and thus have only one break in the day. The members present were asked to think over this subject, and in the meantime the Executive Committee would further consider the matter, and bring it before a general meeting later.

BOLTON AND FARNWORTH ASSOCIATION.

Secretary: J. R. Vose, F.C.I.S.

The members of the Bolton and Farnworth Building Trades Employers' Association held their annual dinner at the Halliwell Lodge Hotel, under the chairmanship of Mr. Ben. Talbot (president). Mr. W. Bullen, president of the Lancashire and Cheshire Building Trades Employers' Association, and Councillors Morris and P. Higson were of the company. After the usual loyal toast, "The Lancashire and Cheshire Federation of Building Trades Employers" was submitted by Mr. Percy Townson, who stated that there were 32 towns federated, with 2,200 members and 600 hon. members. Mr. W. Bullen responded, remarking that county associations and federations were extremely useful in protecting the small builder, who might otherwise be helpless against persecution. Personally he should feel that they had not completed their work until they had all members of the branches of the trade inside their Federation, and thus prevent the cut-throat competition which too often prevailed.—The president proposed the toast of the "National Federation of Building Trades Employers." They owed, he said, a great debt of gratitude to the Federation, without which they would be helpless units.. Mr. Frank Woods responded, eulogising the broad democratic basis upon which the National Federation was elected. One good point of the National was the reserve fund which was being built up, which enabled them to fight most important cases in the law courts. He hoped that Bolton would raise its quota towards the reserve fund.—Mr. Crossley proposed the "Bolton and Farnworth Building Trades Employers' Association." Mr. Coope, Farnworth, one of the vice-presidents, responded. Mr. F. Woods proposed the Mayor and Corporation of Bolton, which was responded to by Councillors Morris and Higson; and the last toast was by Mr. W. Kay, "The Building and General Trade of Bolton."

BRADFORD ASSOCIATION.

Secretary: J. Davidson.

A meeting of the Bradford Association was held on February 23rd. In the absence of Mr. Taylor through illness, Mr. R. Raper, senior vice-president, occupied the chair.

The treasurer presented his report, and several accounts were passed for payment, including the subscription to the Yorkshire Federation and the proportion payable by the association to the National reserve fund.

The attention of the members was drawn to the recent experiences of building trade employers with architects. A case was cited in which an employer had not yet been paid off for two works which had been completed three or four years ago. It was felt that this matter was worthy of careful consideration, with a view to concerted action.

A member mentioned a difficulty which he experienced with respect to wages being paid to workmen engaged on night shifts, and several members explained the custom which had hitherto prevailed in connection with this matter.

HULL ASSOCIATION.

Hon. Secretary: A. Peers.

A whist drive in connection with the Hull Association was held at the Octagon Cafe, King Edward Street, when upwards of 200 members and friends were present, 32 hands being played.

It has been decided to erect a drinking fountain for animals at Bury St. Edmunds as a memorial to "Ouida."

EMPLOYERS AND THE HOUSE OF LORDS.

At a meeting of the Employers' Parliamentary Council, held at Westminster, a relution was adopted in support of the following motion which the Earl of Wemyss will bring forward in the House of Lords in the forthcoming session:—1.—That in the opinion of this House it would be for the public good that important national trading and other organisations and societies should each name three Peers in the current and each succeeding Parliament to speak and act on behalf of such societies in all questions in which they are interested, and that the names of the Peers so nominated be entered in the Journals of the House. 2.—That the Lord Chancellor, the Marquess of Lansdowne, the Earl of Crewe, and the Earl of Halsbury, be empowered to determine what societies are of sufficient importance to be admitted to the said privilege of nomination. 3.—That no Peer shall be entitled to vote on any public question who has not attended 20 sittings in the current or previous session of the House.

Proposed New Works.

ASHTON, WIGAN.—At a meeting of the Buildings, Highways, and Streets Committee the surveyor reported that he had prepared plans and estimates as instructed for the suggested widening of the roadway on Billinge Road, near the Sanitary Depot; and he had also prepared plans and estimates for a suggested widening on the same road at the Downall Green End. It was resolved that the following plans be approved:—N. Adamson, house, Rectory Road; the Managers, Rectory Schools, amended plan, Rectory Road.

BELFAST.—Mr. P. C. Cowan, M.Inst. C.E., chief engineering inspector of the Local Government Board, has held an enquiry here with reference to an application by the corporation for leave to borrow £8,000 and £75,000 for the purpose of extending the lunatic asylum at Purdysburn.

ELGIN.—The town council have resolved to erect new baths in Cooper Park at an expense not exceeding £4,000. It was decided to invite designs from a local architect.

FENTON, STAFFS.—Amongst plans recently passed by the Fenton Urban Council were those of six houses in Church Street, and of six houses in Tirley Street, for Messrs. Challinor and Hughes. The surveyor was instructed to advertise for tenders for the erection of a disinfection station, steam-roller house, fire-engine house, and residence at the Town Yard. It was announced that the Local Government Board has sanctioned the borrowing of £3,770 and £230, required for the provision of an elementary school at Manor Street.

MELROSE.—Plans of the proposed new church have been prepared by Mr. J. M. Dick Peddie, architect, Edinburgh, and have been approved of by the heritors of the parish.

NORWICH.—The Baptist community propose to build a church and schools at a cost of about £6,000.

ROCHDALE.—At a recent meeting of the Buildings, Baths, and Parks Committee of the Rochdale Corporation, plans for 30 new houses were passed.

WESTMINSTER. — Middlesex County Council has agreed to obtain the advice of an expert respecting a proposal to demolish the Guildhall, Westminster, and to erect a new structure on the same site and the adjoining ground belonging to the Council.

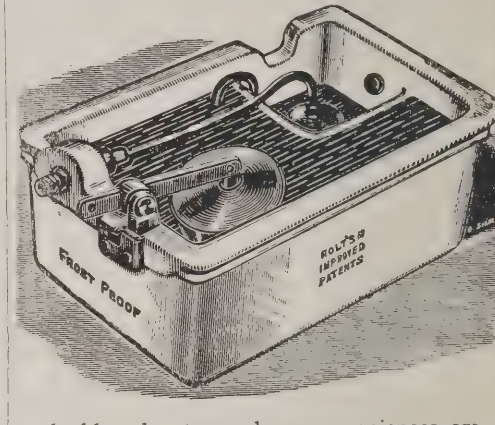
WHITTINGHAM, LANCS.—The Lancaster Asylums Board have formally approved of the plans prepared by Messrs. Sykes and Evans for the erection of a new annexe at Whittingham Asylum. The required accommodation is for 700 patients.

WORTHING.—The directors of the Worthing Pier Company have adopted a scheme for the enlargement and improvement of the pier. The work is estimated to cost approximately £8,500.

Trade and Craft.

Holt's Patent Syphon Cistern.

In Holt's cistern, of which an illustration is here given, the distance between the water-level and the top of the syphon is no more than a quarter of an inch, and never varies. This condition enables the use of a loose-fitting bell, which is always sensitive and reliable in action. No violent destructive pull is necessary in order to start the syphon, and consequently there is no waste of water, time, and temper. The many architects and others who have recorded their satisfaction with these cisterns nearly always mention the ease and certainty with which they respond to the pull of the chain, and the rapidity of refilling after each flush, which is an especially valuable advantage where conveniences are used in quick succession. Prof. H. J. Hele Shaw testifies that these cisterns have been fitted throughout the Victoria building and the Walker Engineering laboratories at University College, Liverpool, and that during the ten years or so during which they have been in operation there has never been any trouble with them. Professor Shaw considers that the use of a separate ball chamber, enabling the syphon to be placed in a compartment by itself, is a valuable and an important invention, as it results in the flushing charge being always constant, whether the ball-tap be in repair or not. This cistern entirely dispenses with valves or other working parts that are likely to get out of order; and the simplicity and strength of the apparatus will be plainly evident from the accompanying illustration. The afterflush is automatic; and Mr. Frank Gray Wallis, the architect, records that "during the late frost an unexpected advantage appeared. The water being slightly frozen, when the cistern was emptied by a flush, the ball chamber did not syphon, and the cistern remained empty, and so protected from the severe frost which followed and broke many other cisterns." The firm publish a long list of important buildings in which their cistern has been adopted. Particulars may be obtained from "Holt's Patents," 3, Smithfield Street, Liverpool.



* * *

Mr. Wm. MacIrvine (formerly of Nottingham) has been appointed managing representative to Messrs. P. Aspinall and Son, stone merchants and masonry contractors, of Finsbury Park, N., who, we are informed, are supplying the whole of the stonework required for the alterations to the Holborn Old Town Hall. All work undertaken by the firm is dealt with under the joint personal supervision of Mr. MacIrvine and Mr. Mark Lemon, the managing director.

* * *

In the notice, under the heading "Our Plate," on page 173 of our issue of February 24th, of the work executed at the East Riding County Council Offices, by Messrs. Diespeker, Limited, whose head office is at 57-60, Holborn Viaduct, E.C., the style of that firm should have been as here rendered.

A LIFE EXPERIENCE **THE COLLECTOR AND BUDD'S PATENT SYSTEM.** **For 5s. 2d.**

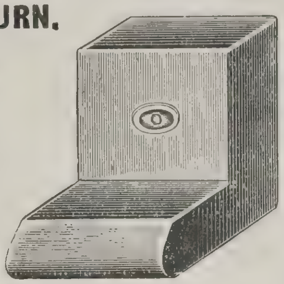
COMPETITION DEMANDS SUCH A WORK AS OFFERED HERE.

THE SAFEGUARD (can be started any week, and no waiting required). THE PRACTICAL SHORT CUT TO OFFICE ROUTINE. **50 per cent.** of clerical labour saved. Not one penny can be lost. **Book-keeping dispensed with for practical workings.** **"Unique."** A great money saver, and the most simple, accurate, and genuine work that can be put before the public. Thousands of copies sold, and unsolicited testimonials coming daily to hand from all over England. The work is for **Builders, Contractors, Decorators combined, or for Carpenters, Bricklayers, Plumbers, Painters, Masons as separate Businesses, Engineers, Joinery Manufacturers, etc.** And for **5s. 2d.** the key of a week of business is sent, showing contract, jobbing and day work, plant, stock, own repairs, cartage and stables, trade and office expenses, and profit and loss accounts, worked out and at a glance. Prime costs of contracts and jobbing works guaranteed to the halfpenny. **Permit grants** for use are sent with systems, and the **system is not** transferable.

ATTENTION *is called to the following Editors' letters to their readers. The Editor of the "Carpenter & Builder" says "A large number of letters have been examined by us re 'The Collector System' all of which afford a remarkable testimony and very general approval of the work. The system is found to be both simple and complete, and many of the correspondents are quite enthusiastic in their expressions of appreciation." The Editor of "The Building World" says "We have seen a large number of original letters in which the writers express their great satisfaction and high appreciation for 'The Collector.'" The Editor of "The Decorator" says "The owner of 'The Collector' produces a number of testimonials from those who have tried it in favour of this improved system of book-keeping." All Cheques and Postal Orders to be crossed and made payable to "The Collector Office" and addressed 19, Henniker Gardens, East Ham, E.*

JAMES CHEW & Co.,
Brookhouse Brass and Copper Works,
BLACKBURN.

Copper Cylinders and Boilers and Pans of every description.
Sanitary Brass work.
Copper Cylinders for any pressure.
CopperBoilersfor every class of range.



Galvanised Cisterns
Roofs and Turrets covered with Copper.

LIFTS, CRANES, CRABS
REVOLVING SHUTTERS,
COLLAPSIBLE GATES,
SLIDING PARTITIONS.
DENNISON, KETT & Co., Ltd.,
II, Queen Victoria Street, LONDON, E.C.
Iron Staircases, Doors and Sashes.
CATALOGUE FREE ON APPLICATION.
Telegrams: "Hoisters, London." Telephone, Bank 8356. A B C Code.

Practical Notes for Architectural Draughtsmen.
By ALFRED W. S. CROSS, M.A., F.R.I.B.A.,
and ALAN E. MUNBY, M.A., A.R.I.B.A.

Complete Set (27 Large Plates in a Portfolio), 12s.
POST FREE, 12s. 6d.

Prof. C. H. REILLY, of Liverpool University, says: "I think it is a very valuable book, and I hope it will find its way into most architectural offices."

THE "PRACTICAL NOTES" gives in most convenient form for use on the drawing board examples with concise rules, explanations and dimensions for preparing Designs, Perspectives and Working Drawings for Classical Architecture with rapidity and precision.

STUDENTS preparing for the examinations of the R.I.B.A. can learn how to draw The Orders correctly with the smallest possible amount of study and work by utilising the invaluable drawings and data given in this publication.

We shall be pleased to forward a copy of this work on approval to any of our subscribers.

THE MANAGER, Technical Journals, Ltd., Caxton House, Westminster, S.W.
Descriptive Leaflet sent post free upon Application.

LAUNDRY
and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE.
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

FOLDING PARTITIONS. 2/- ft. Super.
REVOLVING SHUTTERS. 1/- ft. Super.
Hartley Bros.,
GORTON,
MANCHESTER.

HOSPITALS, INFIRMARIES, SCHOOLS, &c., REQUIRE
MANCHESTER STOVES, GRATES, & VENTILATORS.
E. H. SHORLAND & BRO., Drake Street Works, MANCHESTER.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section,", "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application.

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberavon, Wales.—For erection of a parsonage house for the Vicar of Aberavon. Mr. J. A. James, architect, Port Talbot:—

J. Davies, Aberavon	£2,436	0	0
M. Cox, Port Talbot	2,047	0	0
J. H. Maggs, Cardiff	1,990	15	0
D. Davies and Sons, Cardiff ...	1,890	0	0
W. H. Evans, Cardiff	1,876	0	0
E. G. Groom,* Aberavon ...	1,865	0	0

*Accepted.

Barnsley.—For masons' and bricklayers', carpenters' and joiners', tilers' and plasterers' work required in the re-building of premises in Main Street, Mexborough, for the Barnsley British Co-operative Society, Ltd. Mr. H. L. Paterson, A.R.I.B.A., architect, 19, St. James Street, Sheffield. Accepted tenders:—

Marlow and Sons, Hillsborough, Sheffield, excavator, mason, and bricklayer	£970	0	0
Hawley and Co., Barnsley, carpenter and joiner	345	10	0
Dawber, Townsley and Co., Ltd., Hull and Barnsley, tiler ...	41	10	0
Hudson and Dore, Daniel Hill Street, Sheffield, plasterer ...	55	0	0

Bridlington.—For the different trades required in the erection of a dwelling-house in Cardigan Road, Bridlington, for Mrs. W. Dodgson. Mr. J. Shepherdson, architect, 8, Quay Road, Bridlington:—

A. A. Booth, Bridlington ...	£925	0	0
F. W. Martindale, Bridlington ...	910	0	0
F. Postill and Sons,* Park Avenue, Bridlington	830	0	0

*Accepted.

Brighton.—For the erection and completion of boundary walls and entrance gates and the excavations for and the construction and completion of one covered service reservoir at North Lancing, in the parish of Lancing, for the Brighton Town Council:—

W. Olliver, 58, Franklin Road...	£1,950	0	0
Hockley and Co., Ship Street Chambers	1,412	16	0
A. E. Nunn and Co., Blomfield Street, E.C.	1,348	14	7
R. Cook and Sons, Crawley ...	1,296	0	0
Bostel Bros., Ltd., 18 and 19, Duke Street	1,293	0	0
W. J. Burstow, 16, Gloucester Place	1,236	7	10
J. and W. Simmonds, 2, Ashford Road	1,236	0	0
Rowland Bros, Horsham ...	1,159	0	0
W. Swales, Shoreham	1,144	0	0
H. Lindfield and Son,* Horsham	1,129	0	0

Rest of Brighton.
*Accepted.

Ilfracombe.—For the erection of a new post office at Ilfracombe, for H.M. Office of Works, etc.:—

T. Upton	£4,756
W. Cowlin	3,983
H. Wilkins and Sons	3,968
Pethick Bros., Ltd.	3,900
E. P. Bovey and Son	3,730
Hayward and Wooster	3,650
R. Peckett	3,562
W. T. Stevenson	3,500
Wakeham Bros	3,498
W. E. Blake	3,435
A. N. Coles	3,365
F. J. Stanbury	3,334
Woodman and Son*	3,067

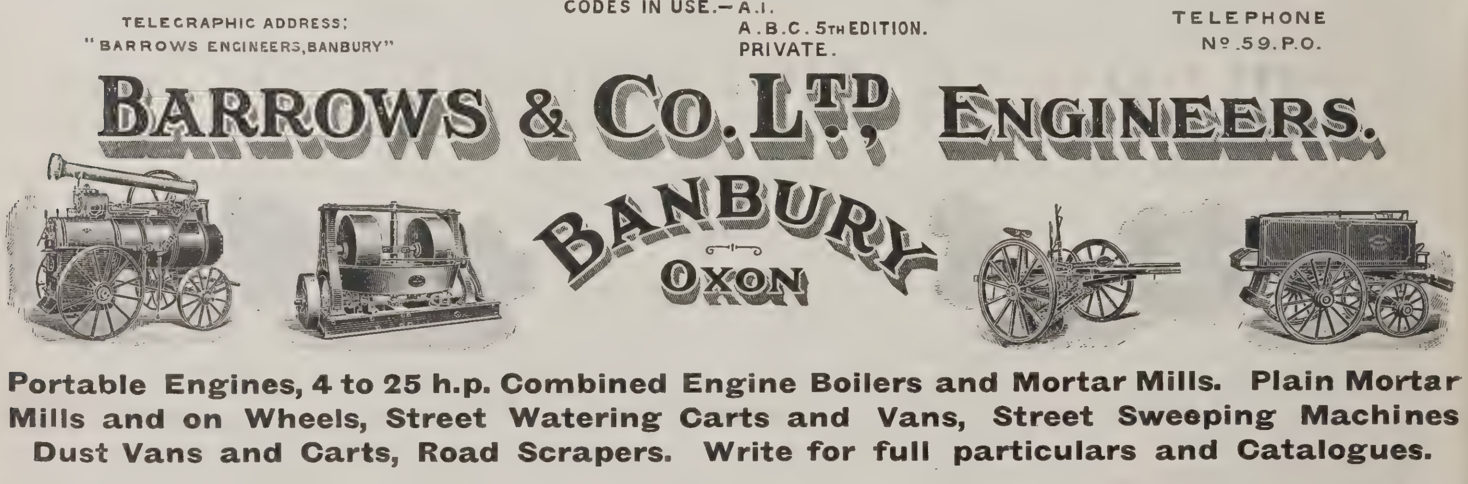
*Accepted.

London, W.—For the erection of a branch post office, South Kensington, and Meteorological Office, for H.M. Office of Works, etc.:—

W. Willett	£21,500
Pethick Bros., Ltd.	21,495
R. Wilkins and Sons	21,466
McLaughlin and Harvey, Ltd. ...	19,715
Galbraith Bros., Ltd.	19,650
Spencer, Santo and Co., Ltd.... ...	19,559
Higgs and Hill, Ltd.	19,484
J. Mowlem and Co., Ltd.	19,458
F. G. Minter	19,178
H. Lovatt, Ltd.	19,170
R. A. Low and Co.	18,889
Perry and Co., Ltd., Bow	18,756
J. Barker and Co., Ltd....	18,730
Holloway Bros, Ltd., London... ...	18,700
McCormick and Sons	18,690
W. King and Son	18,594
J. Smith and Sons, Ltd.	18,479
W. Wallis, Ltd.	18,472
F. and E. Davey, Ltd.	18,434
Leslie and Co., Ltd.	17,989
H. J. Williambs, Ltd.	17,927
A. M. Coles	17,898
E. Lawrance and Sons	17,826
F. and H. F. Higgs*	17,722

*Accepted.

(*Tenders continued on page viii.*)



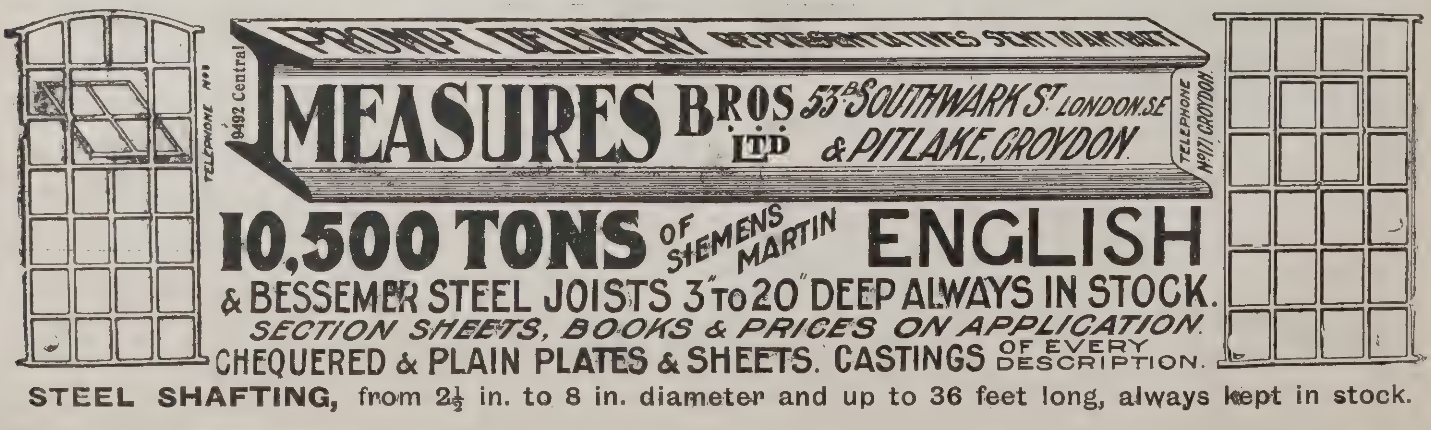
TELEGRAPHIC ADDRESS:
"BARROWS ENGINEERS, BANBURY"

CODES IN USE.—A.1.
A.B.C. 5TH EDITION.
PRIVATE.

TELEPHONE
Nº. 59. P.O.

BARROWS & CO. LTD ENGINEERS.
BANBURY
OXON

Portable Engines, 4 to 25 h.p. Combined Engine Boilers and Mortar Mills. Plain Mortar Mills and on Wheels, Street Watering Carts and Vans, Street Sweeping Machines Dust Vans and Carts, Road Scrapers. Write for full particulars and Catalogues.



PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART
TELEPHONE Nº 9492 Central
MEASURES BROS LTD 53B SOUTHWARK ST LONDON. S.E. & PITLAKE, CROYDON.
TELEPHONE Nº 171 CROYDON.
10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.
SECTION SHEETS, BOOKS & PRICES ON APPLICATION.
CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.
STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock.

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork

H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

RD. JOHNSON CLAPHAM, & MORRIS, Ltd.,

Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered
Soundproof,
Fireproof
Dampproof,

Architects, Builders, and Contractors

Write for Descriptive Catalogue.

Engineering Department,
24, Lever Street,
MANCHESTER.

Telegrams; "Metallicus, Manchester."

Hollow Wall and Cantilever constructed of 4½-in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

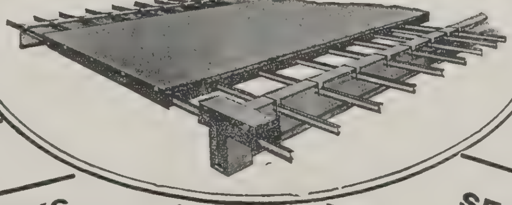
Telephone: 6437 Manchester.

COLUMBIAN FIREPROOFING Co., LTD.

Reinforced Concrete Floors.

RITZ HOTEL, PICCADILLY.
WARING'S, OXFORD ST., W.
ROYAL INFIRMARY, GLASGOW.
"MORNING POST," STRAND.
LAMBETH DISTILLERY.
50 Repeat Orders for L. C. M. BANKS.

ECONOMICAL CONSTRUCTION.
RIGID AND SOUNDPROOF.
SAVING IN COST.
OWNERS & ARCHITECTS ENTIRELY SATISFIED.
SEND FOR PARTICULARS.



"COLUMBIAN" System.

37, KING WILLIAM STREET, LONDON, E.C.

A.W.E.

TEL. No. 5060 BANK.

(Tenders continued fr om

East Stonehouse, Devon.—For alterations to premises, No. 1, St. Mary Street, No. 1, Clarence Place, and the Workhouse premises, East Stonehouse, for the Guardians. Messrs. Thorneley and Rooke, architects, 11, The Crescent, Plymouth:—

Pethick Bros., Laira Bridge Road	£1,107	0	0
E. Pouter, Stonehouse	1,075	0	0
A. R. Lethbridge and Son, Tracey Street	1,037	0	0
R. Wilkins and Sons, Bristol	995	0	0
H. J. Allen, Devonport	933	0	0
J. Crockerell, Devonport	930	0	0
G. Triscott, Plympton	921	3	5
T. Crews, Stonehouse	910	0	0
G. B. Turpin, Courtenay Street	905	0	0
W. Littleton and Son, Devonport	902	0	0
A. N. Coles, Old Town Street	895	0	0
I. W. S. Trevan, 1, Oxford Place	860	0	0
Pearn Bros., Gilwell Street	860	0	0
I. Paynter, 3, Pentille Road	852	0	0
A. Andrews, 6, St. Lawrence Road	852	0	0
W. T. Stevenson, 43, Tavistock Place	820	0	0
E. E. Endicott, Peverell	805	0	0
F. Taylor, Stonehouse	793	0	0
S. Roberts, Ltd., West Hoe	786	14	9
D. Larwithen,* 45, Trelawny Road	763	0	0

Rest of Plymouth.

*Accepted.

Llangan, near Bridgend.—For alterations to Llangan Rectory, near Bridgend, for the Rev. Owen Jones, rector. Mr. G. E. Halliday, F.R.I.B.A., architect, 19, Castle Street, Cardiff:—

Card and Powell, Neath	£900	0	0
Knox and Wells, Cardiff	897	0	0
Cox and Bardo, Cardiff	882	18	0
E. Rees and Sons, Pencoed	865	0	0
P. Gayland, Bridgend	831	0	0
G. Hallett, Cardiff	830	0	0
T. Wybert,* Cowbridge	735	4	6
W. Cox, Llandaff	657	0	0

*Accepted.

London.—Recommended for acceptance, for erection of 32 additional cottages on the second part of Section B of the Norbury Estate, for the L.C.C.:

Gathercole Bros.	£6,579	14	0

Newcastle.—For erection of Newcastle Head Post Office, for H.M. Office of Works, etc.:—

S. Fenwick and Co.	£25,580	0	0
W. H. Ayton	25,100	0	0
J. Craven	24,680	17	0
S. F. Davidson and Miller	24,269	13	2
J. and W. Lowry	24,200	0	0
J. C. Ferguson	23,348	0	0
R. Neill and Sons	22,084	0	0
S. Easten, Ltd.	21,977	0	0
T. Lumsden	21,500	0	0
E. H. Manchlen	21,170	10	0
Middlemiss Bros.	20,976	6	0
J. Milne	20,678	10	0
Kirk and Brown*	20,275	1	11

*Accepted.

Norwich.—For administrative block and women's pavilion, new infirmary, Norwich. Messrs. Morgan and Buckingham, architects, surveyors, valuers, and estate agents, 1, Upper King Street, Norwich:—

Dawes and Son	£13,050
Scarles Bros.	12,847
J. S. Smith	12,770
J. Youngs and Son	12,541
Hawes and Son	12,498
J. Hurn and Sons	12,095
T. H. Yelf	11,994
H. C. Greengrass	11,858
T. Gill	11,754
H. J. Hannant, Norwich	11,739

St. Albans, Herts.—For the erection of a new school at St. Paul in Hatfield and Blandford Roads. Messrs. J. E. K. and J. P. Cutts, architects:—

E. Dunham, St. Albans	£8,475
Harris and Wardrop, Limehouse	8,180
G. Godson and Sons, Kilburn	7,789
A. J. Staines, Great Titchfield Street	7,776
Bowman and Sons, Dulwich and Stamford	7,725
J. Darvill, Watford	7,600
J. Dorey and Co., Brentford	7,599
L. H. and R. Roberts, Islington	7,587
Ekins and Co., Ltd., Hertford	7,586
C. Miskin and Sons, St. Albans	7,550
J. Honour and Son, Tring	7,445
J. Bentley and Sons,* Waltham Abbey	7,324

*Accepted.

Sutton, Surrey.—For erection of a house in the Worcester Road, for Mr. Gerald Pilditch. Messrs. Frank Chown and Sheffield, architects, 2, Princes Street, Hanover Square, W. Quantities by Messrs. Andrews and Read, 13, Basinghall Street, E.C.:—

Gathercole Bros.	£1,960
G. Parker and Son	1,937
E. J. Saunders	1,924
J. Smith and Sons	1,897
Cropley Bros., Ltd.	1,887
B. E. Nightingale,* London	1,755

*Accepted.

Todmorden.—Accepted for the erection of a secondary school, Stile Estate, Todmorden. Mr. Jesse Horsfall, F.R.I.B.A., Todmorden, and 4, Chapel Walks, Manchester.

Benj. Lumb, mason and bricklayer, Todmorden,
Ineson Taylor, carpenter and joiner, Keighley,
Tillotson Blacka, slater, Todmorden,
A. Waller, plumbing, Todmorden,
R. Dawson and Co., heating, Stalybridge,
Fox and Co., electric lighting, Batley,
Tillotson Blacka, plastering, Todmorden
Wrigley and Sons, painting, Todmorden,
£8,975 0 0

Architect's estimate, £9,560 0 0.

Watford.—For the erection of Leavesden Road Baptist Church. Messrs. G. Baines and Son, architects, 5, Clement's Inn, Strand, W.C.:—

Bracey and Clark, 100, Cecil Street, Watford	£4,905
H. Brown, Whippendell Road	4,827
G. and J. Waterman, 103, High Street	4,710
J. Darvill, Nascot Street	4,660
Clark Bros., Teamley Street	4,527
G. Wiggs, 90, St. Albans Road	4,485
W. King, 41, Market Street	4,455
C. Brightman and Son,* 108, Queen's Road	4,279

*Accepted

Thrybergh, Yorks.—For working men's club, Thrybergh, near Rotherham, for the trustees. Mr. P. A. Hinchliffe, A.R.I.B.A., architect, 14, Regent Street, Barnsley:—

Chadwick and Co.	£2,750
J. Cooper	2,643
W. Thornton and Son	2,631
R. Snell	2,492
W. H. Trehern	2,420
J. R. Newton	2,154
W. M. Beeden,* Thrybergh, Rotherham	2,054

*Accepted.

Worksop.—For erecting offices in Carlton Road, for the Waterworks Company. Mr. A. H. Richardson, architect, Market Place, Worksop:—

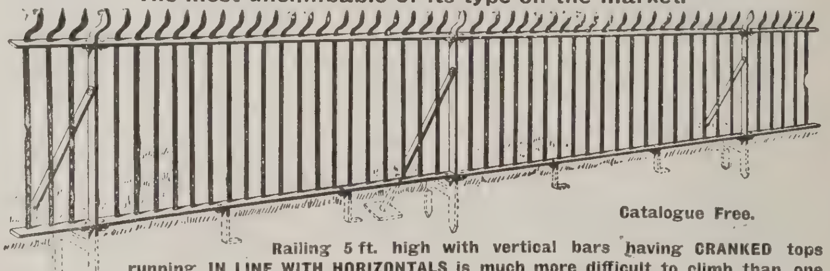
D. Gill and Sons	£2,077	0	0
Ilet and Sons	2,025	0	0
H. and A. Forsdike	1,985	0	0
J. Doncaster	1,950	0	0
Bowles and Son	1,942	0	0
G. G. Middleton	1,936	0	0
C. A. Leverton	1,919	18	0
F. J. Rowsell	1,804	15	0
Perks and Sons, Ltd.,* Long Eaton	1,699	0	0

*Accepted.

W.C. CISTERNS.
Best Cistern on Earth. Used in the Best Work.
Inexpensive. Sensitive. Frost Proof.
Always Fills. Silent. Quick Filling.
HOLT'S PATENTS, 3, Smithfield St., Liverpool.

LIGHTNING CONDUCTORS
Supplied, Erected and Tested. Chimney Shafts Restored, &c.
J. LEWIS, 5 & 6, Great Winchester Street LONDON, E.C.
TELEPHONE No. 3053 CENTRAL.

BAYLISS, JONES & BAYLISS LTD.,
THE "CRANKED BAR" RAILING.
The most unclimbable of its type on the market.



Catalogue Free.
Railing 5 ft. high with vertical bars having CRANKED tops running IN LINE WITH HORIZONTALS is much more difficult to climb than one 6 ft. high with straight pointed bars.
WOLVERHAMPTON & CANNON STREET, LONDON, E.C.

"Modernia" Patent Glass Tiles
give an artistic and novel effect.
No glassy surface. Coloured throughout. Substance about $\frac{1}{4}$ inch. Any colour supplied. Prospectus, Samples, Estimates and Designs for complete decorations, free.
The "Modernia" Patent Glass Tile Co.
Sole Concessionaires: Aug. Brennecke & Co., 68 Finsbury Pavement, London, E.C.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

March 3-15. TIDWORTH (HANTS.).—Erection of a forage barn and riding school at Tidworth Hants., in the southern command. For plans, specification, and conditions of contract at the office of the Director of Barrack Construction, 80, Pall Mall, London, S.W., or at the Barrack Construction office, Tidworth, Hants., up to March 3. Apply to the Director of Barrack Construction by March 5 for bills of quantities, deposit 10s. Cheques or orders payable to the assistant financial secretary, and crossed "Bank of England for Credit to Army Funds." Tenders marked "Tender for Forage Barn and Riding School, Tidworth," by noon on March 15, to H. de la Bere, director of Army contracts, War Office, Whitehall, London, S.W.

March 3-15. LONDON.—Erection of new bridge and covered way between R.A.M. College and Laboratories, also museum, sanitary fittings, and alterations and additions to water supply at Millbank, S.W., for the Secretary of State for War. Plans, specification, and conditions of contract at the office of the Director of Barrack Construction, 80, Pall Mall, London, S.W., up to March 3. Apply to the Director of Barrack Construction by March 5 for bills of quantities, 10s. deposit. Cheques or orders payable to the assistant financial secretary, and crossed "Bank of England for Credit to Army Funds, etc." Tenders marked "Tender for New Bridge, etc., Millbank, S.W.," by noon on March 15th, to H. de la Bere, director of army contracts, War Office, Whitehall, London, S.W.

March 4. SELBY.—Erection of a caretaker's cottage and outbuildings at the school, Gowthorpe House, for the governors of the Selby secondary school for girls. Plans, specifications, and further information at the office of J. H. Bantoft, clerk to the governors, 33, Finkle Street, Selby. Sole tenders only considered, and contractors to take off their own quantities. Tenders, on form supplied, to the clerk of the governors by noon on March 4.

March 4. TREDEGAR (MON.)—Erection of a new vicarage for the parish of St. James's, Tredegar (Mon.), for the Rev. G. E. H. Theophilus. Plans and specifications at the office of A. F. Webb, architect, Blackwood (Mon.), and bills of quantities upon deposit of £1 1s. Tenders to the vicar by March 4.

March 5-20. BITTON (NEAR BRISTOL).—Erection of a new elementary school at Bitton, for the Gloucestershire education committee. Bills of quantities upon deposit of £2 2s., of R. S. Phillips, architect, Midland Bank Chambers, The Cross, Gloucester. Applications by March 5, and tenders by 9 a.m., on March 20.

March 6. BALLINTOY, CO. ANTRIM.—Erection of a hotel at Ballintoy, Co. Antrim, for Alexander Dixon. Plans and specifications with Albert J. Clarke, C.E., architect and surveyor, 5, Salsbury Terrace, Portrush, to whom submit tenders by March 6.

March 6. BLACKWATER (CORNWALL).—Erection of addition to Blackwater council school, for the education committee. Plans and specification by appointment at the school or at the office of Sampson Hill, architect to the committee, Green Lane, Redruth, from whom all particulars may be obtained. Tenders by March 6, to F. R. Pascoe, secretary, education office, Truro.

March 6. DONEMANAGH (IRELAND).—Erection of a manse at Donemanagh. Plans and specifications at the office of W. Stuart, B.E., M.R.S.I., Strabane. Tenders to the Rev. D. Hay, M.A., Donemanagh, by March 6.

March 6. OGMORE VALE.—Erection of a new church at Ogmore Vale. Plans, specifications, and bills of quantities, at offices of J. Cook Rees, architect, Parade Chambers, Neath. Tenders to the Rev. A. J. Edwards, The Vicarage, Ogmore Vale, by March 6, endorsed "Tender for Church."

March 6. WESTHOUGHTON.—Alterations to the Independent Methodist Church, Dicconson Lane, Westhoughton. Particulars from Joseph Boardman, 81, Dicconson Lane, Aspull, Wigan, to whom tenders are to be submitted by March 6.

March 6. WINCHESTER.—Repairs to 40 cottages in different parts of Winchester, for the Winchester Cottage Improvement Society. Specification of J. Ashton Sawyer, chartered surveyor, Winchester. Tenders to Walter Bailey, 19, St. Peter Street, Winchester, by noon, on March 6.

March 6-18. CLEETHORPES (LINCOLN).—Completion of the building of an elementary school for infants at Cleethorpes, Lincoln, for the Lindsey C.C. Education Committee. Bills of quantities and form of tender on application to Scorer and Gamble, architects, Bank Street Chambers, Lincoln, by March 6, and on deposit of £2 2s. Drawings and conditions of contract at the offices of the architects. Tenders before 10 a.m. on March 18, to S. Maudson Grant, secretary, 286, High Street, Lincoln.

March 8. BRISTOL.—Erection of a chancel with vestries, and other work, at the Church of St. Anne's, in the parish of Brislington, for the Building Committee. Plans and specifications and bills of quantities, at the office of Henry M. Bennett, architect, 36, Corn Street, Bristol. Tenders endorsed "St. Anne's Church Extension," to the Rev. A. C. Harman, M.A., at the Vicarage, Brislington, by 6 p.m. on March 8.

March 8. EAST GRINSTEAD.—Alterations and improvement of the Court House and Police Buildings at East Grinstead, for the East Sussex C.C. Names and addresses by March 8, to F. J. Wood, M.S.A., county surveyor of East Sussex, County Hall, Lewes, from whom all particulars can be obtained.

March 8. LIVERPOOL.—Jobbing repairs (gasfitters, joiners, masons, and bricklayers, plumbers, slaters, and smiths) in connection with the workhouse, Brownlow Hill, and other parochial buildings, from March 28, 1909, to March 26, 1910, for the Select Vestry. Forms of tender and all information on application to H. J. Hagger, vestry clerk, parish offices, Brownlow Hill, to whom submit tenders by March 8.

March 9. CAMBRIDGE.—Erection of five cottages in Albion Row. Plans, specifications and drawings at the office of the surveyor, Guildhall, Cambridge, where further particulars, with form of tender may be obtained. Tenders, endorsed "Tender for Erection of Cottages," to the office of J. E. L. Whitehead, town clerk, Guildhall, Cambridge, by March 9.

March 9. WREXHAM.—Alterations and additions at the electricity works, Willow Road, for the corporation. Plan, specifications, and form of tender at the borough engineer's office, Willow Road. Tenders, endorsed "Electricity Works Alterations," to Lawson Taylor, town clerk, Guildhall, Wrexham, by March 9.

March 10. BRIERLEY HILL (SOUTH STAFFS.).—Erection and completion of a new council school for 324 girls at Mill Street, Brierley Hill, for the education committee. Apply, by March 10, to Graham Balfour, director of education, county education offices, Stafford. Quantities upon deposit of £1 1s.

March 10. EDINBURGH.—Designs and estimates for a band-stand proposed to be erected in Saughton Public Park, for the Magistrates and Council. Specification prepared by J. A. Williamson, A.R.I.B.A., public works office, City Chambers, who will furnish copies. Tenders (accompanied by designs) marked "Tender for Band-stand, Saughton Park," by March 10, to Thomas Hunter, W.S., town clerk, City Chambers, Edinburgh.

March 10. GARRISON, CO. FERMANAGH.—Erection of a curate's residence at Garrison, Co. Fermanagh, for the Rev. Patrick A. M'Cleary, M.P. Plans and specification with J. V. Brennan, C.E., architect, Belfast Bank Chambers, Belfast, to whom submit tenders before March 10.

March 10. YORK.—Erection of a motor garage at York, for the North-Eastern Railway. Plans and specification and quantities and further information upon application to William Bell, the company's architect at York. Quantities supplied on personal application to the parties tendering for the whole of works. Tenders, marked "Motor Garage, York," to the secretary at York, by 9 a.m. on March 10.

March 10. SLADES, ST. AUSTELL.—Erection of three cottages at Slades, St. Austell, for Mrs. M. Kent. Plans and specifications at the office of the architect, B. C. Andrew, M.S.A., Biddick's Court, St. Austell, to whom tenders are to be submitted by March 10.

March 10. TATTENHALL (NEAR CHESTER).—Erection and completion of a house at Tattenhall, near Chester, for J. B. Williams. Plans and specifications on application. Tenders by first post on March 10, to E. Norcross, estate office, The Grange, Beaconsfield, Bucks.

March 11. PEMBURY (KENT).—Alterations at the infirmary and men's day room, at the workhouse, Pembury, for the gaurdians of Tonbridge Union. Plans, specifications, and particulars of S. Philpott, architect, 65, High Street, Tunbridge Wells, between 10 a.m. and 12.30 p.m. Tenders, endorsed "Tender for Buildings, etc.," at the office of Neville R. Stone, clerk, 23, Church Road, Tunbridge Wells, before noon on March 11.

March 13. PERTH.—Construction of greenhouses, etc., at Wellshill cemeteries, for the T.C. Plans, specifications, and forms of tender, at office of James W. Bayne, superintendent of cemeteries, Wellshill, Perth. Tenders with John Begg, town clerk, Perth, endorsed "Tender for greenhouses," by March 13.

March 13. ST. AUSTELL.—Erection of three dwelling houses at Mount Charles. Plans and specifications at the residence of Philip Craggs, Mount Charles, St. Austell, and to whom endorsed tenders are to be sent by March 13. Further particulars may be obtained from John Mutton, architect, Charlestown, St. Austell.

March 15. BIRKENHEAD.—Erection and completion of 22 double-tenement dwellings for the corporation. Plan, specification, and particulars, bill of quantities and form of tender on application to the office of Chas. Brownridge, M.Inst.C.E., borough engineer and surveyor, and £1 1s. deposit. Fair wages clause. Tenders, endorsed "Tender for Tenement Dwellings," by 5 p.m. on March 15, to James Fearnley, town clerk, town hall, Birkenhead.

March 15. TONBRIDGE.—Erection of a stamping station (consisting of two rooms), for weights and measures, in Lyons Crescent, Tonbridge, for the C.C. Plan, specification, bill of quantities, and form of tender at the office of the county architect, 86, Week Street, Maidstone, between 10 and 5. Tenders, endorsed "Stamping Station," by 10 a.m. on March 15, to W. B. Prosser, clerk of the Kent C.C., Sessions House, Maidstone.

March 15. YORKHILL.—Construction of a goods shed on Riverside Quay, Yorkhill, 1,370 feet long by 100 feet wide, for the Trustees of the Clyde Navigation. Drawings, specifications, schedule of quantities, and form of tender on application to the trustees' engineer, at his office. Tenders, marked "Tender for Shed at Yorkhill," by noon on March 15, to T. R. Mackenzie, general manager and secretary, 16, Robertson Street, Glasgow.

March 17. STOCKWELL, S.W.—Reconstruction of the upper boiler house and coal store at the South-Western Fever Hospital, Landor Road, Stockwell, S.W., for the Metropolitan Asylums Board. Drawings, conditions of contract, and specification prepared by W. T. Hatch, M.Inst.C.E., M.I.Mech.E., engineer-in-chief, at the office of the Board, Embankment, E.C., on deposit of £2. Tenders, addressed as noted on form, at the office of the Board, by 10 a.m. on March 17.

March 19, BOOTLE.—Erection and completion of a public elementary council school in the Orrell district of Bootle, for the Corporation. Plans prepared by Crouch, Butler, and Savage, architects, 39, Newhall Street, Birmingham. Plans at the borough engineer's office, and bill of quantities on application to J. Henry Farmer, town clerk, town clerk's office, Bootle, and on deposit of £2 2s. Fair wages clause. Tenders at the town hall by noon on March 19.

March 25, WANDSWORTH, S.W.—Erection of new iron buildings and other works at Swaffield Road, Wandsworth, S.W., for the Guardians of the Union. Drawings and specification, and form of tender upon application at the Guardians offices, St. John's Hill, Wandsworth, near Clapham Junction railway station. £1 deposit. Tenders by 10 a.m. on March 25, to Frank W. Piper, clerk to the Guardians, Guardians' offices, St. John's Hill, Wandsworth, S.W. Acceptance of tender subject to sanction of L.G.B.

ENGINEERING.

March 6. MIDDLETON.—Supplying two new retort settings, for the corporation. Particulars on application to C. F. Broadhead, gas engineer, gasworks, Middleton. Tenders, endorsed "Settings," addressed to the chairman of the gas committee, by March 10, to Frederick Entwistle, town clerk, town hall, Middleton.

March 10. WORMHILL (DERBYSHIRE).—Construction of a concrete service reservoir, sinking wells, providing carting, laying and jointing about 2¾ miles of 3-in. and 4-in. diameter cast-iron mains, with all valves, hydrants, and other works, at Wormhill, near Miller's Dale, Derbyshire, for the Chapel-en-le-Frith R.D.C. Plans, specification, bill of quantities, and form of tender at the offices of the engineers, Swann and Brady, town hall, Chapel-en-le-Frith, upon deposit of £2 2s. Tenders endorsed "Tender for Waterworks," by March 10, to John Burton Boycott, clerk to the council, union offices, Chapel-en-le-Frith, via Stockport.

March 12. EDINBURGH.—Reconstruction of the bridge carrying the Haymarket branch over Gorgie Road at Tynecastle, Edinburgh, for the directors of the Caledonian Railway. Drawings at the office of the company's engineer, Buchanan Street Station, Glasgow, where specification and schedule may be obtained on deposit of £2 2s. Tenders, endorsed "Tender for Reconstruction of Tynecastle Bridge, Edinburgh," by March 12, to J. Blackburn, secretary, Caledonian Railway Company's Offices, 302, Buchanan Street, Glasgow.

March 13. BEAMINSTER (DORSET).—Supplying, delivering, laying, and jointing about 750 yards of 3in. cast iron socket pipes, with appendages, including sluice valves, hydrants, stand pipes, and other works, for extension of mains for the water supply of Beaminster to Newtown and Shortmoor, and providing additional hydrants in the town, for the R.D.C. Drawings, specifications, and conditions at the office of the clerk. Tenders, endorsed "Beaminster Waterworks, Contract No. 3," by 10 a.m. on March 13, to Robert Leigh, clerk to the R.D.C., Beaminster, Dorset.

March 19. ROTHERHAM.—Execution of (1) heating and ventilation and (2) electric installation at the new secondary school for girls, for the corporation. Plans and specifications at the education offices, town hall, Rotherham, or the offices of the architects, Holdgate and Harrison, 9, Gray's Inn Square, London, W.C. Tenders, endorsed (1) "Heating" and (2) "Electric Lighting of New Secondary School" respectively by March 19, to Spurley Hey, director of education, education offices, town hall, Rotherham.

March 24. BURY.—Erection of an electricity generating station at Chamber Hall, for the Corporation. Execution of the following works:—2, Structural steelwork; 3, reinforced concrete retaining wall; 4, steel windown frames; 5, patent glazing. Drawings, specifications, bills of quantities, and forms of tender upon application to Arthur W. Bradley, Assoc.M.Inst.C.E., borough engineer, Bank Street, on and after March 3, for 3, 4, and 5, and after March 8 for 2, on deposit of £2 for each contract. Tenders to the Town Clerk, Bury, by 9 a.m. on March 24.

IRON AND STEEL.

March 4. GILLINGHAM (KENT).—Supplying 500 yards of unclimbable wrought iron fencing, 5ft. 6in. high, and 94 yards of wrought iron hurdle fencing for the corporation. Forms of tender from J. L. Redfern, borough surveyor. Tenders, endorsed "Tender for Fencing," by noon on March 4, to F. C. Boucher, town clerk, corporation offices, Gillingham, Kent.

March 5. LONDON (FOR MADRAS).—Supplying steel rails and fishplates as specification at the offices of the company, for the board of directors of the Madras and Southern Mahratta Railway Company, Limited. Tenders, marked "Tender for Steel Rails and Fishplates," by noon on March 5, to Percy A. Cory, pro. secretary, offices, 91, York Street, Westminster, S.W. £1 1s. for specification (not returnable).

March 9. SWANSEA.—Supplying and delivering 100 yards of unclimbable fencing for use adjoining the destructor, for the corporation. Specification at the borough office, 13, Somerset Place. Tenders by 10 a.m., on March 9, to Jno. Thomas, town clerk, Guildhall, Swansea.

March 12. PERTH.—Supplying cast-iron pipes, malleable pipes and fittings, brass fittings, etc., from Mar 1, 1909, to April 30, 1910, for the T.C. Form of tenders and full particulars on application to W. B. M'Lusky, general manager. Tenders to John Begg, town clerk, Perth, by 10 a.m., on March 12.

PAINTING.

March 4. SOUTHEND-ON-SEA.—Cleaning and painting works at Palmeira Arches, Westcliff, for the Corporation. Plans, conditions, specification, and forms of tender, on deposit of £1 1s. cheque, upon application to Ernest J. Elford, M.I.M.E., borough engineer and surveyor. Tenders, endorsed "Painting, Palmeira Arches," to be delivered before noon on March 4, to H. J. Worwood, town clerk, pro. tem., town clerk's office, Southend-on-Sea.

March 6. BRISTOL.—Re-painting at the Fishponds Asylum, for the visiting committee of the lunatic asylum. Specification at the office of Peter Addie, on deposit of £2 2s. Tenders, endorsed, "Fishponds Asylum, Painting," to Peter Addie, the exchange, Corn Street, Bristol, by 10 a.m., on March 6.

March 10. YORK.—Painting the station buildings, etc., on the following branches, for the North-Eastern Railway Co., (1) Newcastle to Monkseaton and Ponteland branch; (2) Morpeth to Percy Main Staiths; (3) Newbiggin and Blyth branches; (4) Consett branch; (5) Haswell to East Hartlepool, Wellfield to Stockton-on-Tees, and Seaham to Hart branches; (6) Pelaw and South Shields branch; (7) Pelaw and Sunderland branch; (8) Company's property, Tyne Dock. Specifications, quantities, and further information on application to Charles A. Harrison, the Company's engineer, Forth Banks, Newcastle, up to March 6. Tenders, marked "Tender for Painting," to the secretary at York by 9 a.m. on March 10.

PLUMBING & SANITARY

March 4. SOUTHEND-ON-SEA (ESSEX).—Erection of a convenience on the cliffs for the corporation. Plans, sections, conditions, specification, bill of quantities and form of tender on deposit of cheque (£1 1s.), and application to Ernest J. Elford, M.I.M.E., borough surveyor. Tenders, endorsed "Convenience, The Cliffs," by March 4, to H. J. Worwood, town clerk, pro tem., town clerk's office, Southend-on-Sea.

March 8. STOKE-UPON-TRENT.—Erection of shelters and conveniences, for the Cliffe Bank, and Field-place Recreation Grounds, for the corporation. Bills of quantities, and drawings, upon application at the town hall, Stoke-on-Trent. Tenders, endorsed, by noon on March 8, to A. Burton, A.M.I.C.E., etc., borough engineer and surveyor, town hall, Stoke-upon-Trent.

March 16. LONDON.—Construction of a sewer, for the L.C.C., mainly of cast iron, lined with concrete and blue brick, 7ft. internal diameter, total length about 14,770ft., to be formed in tunnel, with weir chambers, manholes, side entrances, ventilators, etc., between Grosvenor Crescent and Warwick Road, Kensington. Drawings, specifications, bills of quantities, form of tender and other particulars of chief engineer, Maurice Fitzmaurice, C.M.G., at County Hall, Spring Gardens, S.W., upon deposit with cashier of council of £10. Tenders by 11 a.m., on

March 6, to G. L. Gomme, clerk of L.C.C., County Hall, Spring Gardens, S.W. Fair wages clause.

March 19. WAKEFIELD.—Erection of Dodworth new school, near Barnsley, Castleford, Pontefract Road new school, Wickersley temporary school, for the West Riding education committee. Plans and specifications, with quantities, on application to the West Riding architect, county hall, Wakefield. £1 deposit in each case by separate letter to the West Riding treasurer, county hall, Wakefield. Tenders, endorsed, by 10.30 a.m. on March 19, to Francis Alvey Darwin, clerk of the C.C., county hall, Wakefield.

ROADS AND CARTAGE.

March 4. GREENWICH.—Paving the roadway and footways of Kinveachy Gardens (portion of) for the corporation, and other works according to the specification and plan to be seen, and further particulars obtained at the borough engineer and surveyor's office, town hall, Greenwich Road, S.E. Tenders endorsed "Tender for paving Kinveachey Gardens," by noon, on March 4, to Francis Robinson, town clerk, town hall, Greenwich Road, S.E. Fair wages clause.

March 4. WIGAN.—Supplying road materials for the year ending March 25, 1910, for the Council. For particulars apply to R. B. Marsh, highways surveyor, Parbold, near Southport. Tenders by March 4, to Henry Ackerley, clerk, 9, Victoria Buildings, King Street, Wigan.

March 5. DEWSBURY.—Paving, flagging, etc., Cliffe Street and back Cliffe Street, for the corporation. Plans, specifications, etc., and forms of tender on application at the borough surveyor's office, town hall, Dewsbury. Tenders, endorsed "Private Street Paving," by noon on March 5, to H. Ellis, town clerk, town hall, Dewsbury.

March 6. RICCALL (YORK).—Supplying materials for the repair of roads in the district for the year ending March 31, 1910. Forms of tender on application to the clerk. Tenders, marked "Tenders for Materials," to E. Townend, clerk, council offices, 1, Abbey Place, Selby, by March 6. Samples to the council office by March 6.

March 8. COWES.—Supply and delivery of 180 tons of broken Guernsey granite, for the U.D.C. Particulars, with form of tender, upon application to John H. Webster, surveyor to the council. Tenders, endorsed "Tender for Granite," by 4 p.m. on March 8, to H. C. Damant, clerk, High Street, Cowes.

March 8. LICHFIELD.—Supply and delivery of 2¼in. granite and chippings and slag, at various stations and wharves during the ensuing year for the R.D.C. Tenders, endorsed "Tender for Granite," together with samples, must be delivered, free of charge, by March 8, to John Derry, clerk to the council, R.D.C. offices, Lichfield. Further particulars and forms of tender upon application to C. O. Rawstron, district surveyor, Lichfield.

March 9. RISHTON.—Supplying for the U.D.C., channels, kerbs, setts, flags, limestone (broken), granite (broken), sanitary brushes, etc., pipes, gullies, etc., irregular castings, brushes, etc., carting stone, etc., from railway station to various parts of the district as required, removal of nightsoil per load, carting road refuse per day. All information and forms of tender from the surveyor, at the council offices, 4, Church Street, Rishton, where tenders, marked "Tenders for Supplies, etc.," must be received by J. J. Adams, clerk to the council, by 5 p.m. on March 9.

March 9. NEWPORT (MONMOUTH).—Making and forming a new road, being a diversion of the Newport and Bedwas main road at Church Road in lieu of Volland Hill, for the C.C. Plans and specifications at the office of William Tanner, F.S.I., county surveyor. Copies of the quantities, on deposit of £1 1s. Tenders to the county surveyor by March 9.

March 9. FAVERSHAM.—Supplying pit flints (broken), shingle and fine gravel for roads within the district, for the R.D.C. Full particulars on application to J. G. Chittenden, district surveyor, Ashford Road, Faversham. Tenders, addressed to the board, before 4 p.m., on March 9, to Allan Tassell, clerk, Faversham. Name of pit to be specified.

March 12. CHESTERTON.—Supplying about 5,000 tons broken Leicestershire granite, for the R.D.C. Tenders by 6 p.m. on March 12, to John F. Symonds, clerk, 9, Bene't Street, Cambridge. Samples, carriage paid, to the district surveyor, J. Dunn, Brunswick House, Cambridge.

March 13. COVENTRY.—Supply and delivery of the following materials during year ending March 31, 1910, for the Corporation:—Broken roadstone, granite kerbs, granite setts, stoneware pipes, castings, workmen's tools. Form of tender and full particulars of the engineer and surveyor. Tenders, by 10 a.m., on March 13, endorsed "Tender for Materials," to J. E. Swindlehurst, M.Inst.C.E., city engineer and surveyor, Saint Mary's Hall.

March 13. ERPINGHAM.—Making up Cliff Road and Thurst Road, Overstrand, for the R.D.C. Plans and sections at the house of Robert Mann, district highway surveyor, Cromer Road, Holt. Specifications and forms of tender of Mr. Mann on deposit of £1 1s. Tenders endorsed "Tender for Overstrand Road Making," to the chairman of the highway committee, c.o. Robert Mann, Holt, by March 13.

March 15. NEWARK.—Supplying about 800 tons of granite, 2,250 tons of slag and 80 tons of tar macadam, for the R.D.C. Tenders, marked "Tender for Road Material." to be delivered by March 15, to A. J. Franks, clerk, union offices, 24, Lombard Street, Newark. Samples, free of expense, at the board room, The Ossington, Newark, by March 15. Further particulars upon application to the district surveyor, R. Oakden, jun., Winchilsea Avenue, Newark.

March 18. CROYDON.—Treating 125,000 yards of road surface with Tarvia on highways in various parts of the district, for the R.D.C. Further particulars on application to J. S. Killick, A.M.I.C.E., highway surveyor, town hall, Croydon. Tenders, endorsed "Tender for Tarvia," by noon on March 18, to Ernest John Gowen, clerk of the council, town hall, Croydon.

March 22. CHELMSFORD.—Supplying 250 tons of rough granite for breaking, for the Guardians of the Union, to be delivered into the store at the Union House, Wood Street, Chelmsford, by April 7. Forms of tender on application to Arthur S. Duffield, clerk, 96, High Street, Chelmsford, to whom tenders must be returned by March 22.

March 22. ECCLES.—Supplying for the year ending March 31, 1910:—Setts (granite, grit, lonkey paving, crossing and flag rock), flags (best and seconds barns), concrete, manhole, lampeye, and gully, kerbs (rough, straight, and circular), channel stones (straight and circular), broken rubble (per ton), granite macadam and chippings, prepared tarred limestone, limestone cube chippings, gravel (pit or river, per ton), castings, pitch, creosote, and tar, Simpson's patent street gullies, stoneware passage gullies, stoneware pipes, bends, and junctions, cinders (per ton), mortar (per ton), for the corporation. Forms of tender and particulars on application to Thomas S. Picton, C.E., borough engineer, Eccles. Tenders, endorsed "Tender for Highway Materials," by noon, on March 22, to Edwin Parkes, town clerk, town hall, Eccles. Samples of all materials must be supplied, carriage paid, to the borough engineer, by March 25.

MISCELLANEOUS.

March 8. PONTYPRIDD.—Laying out, draining, enclosing for burial purposes, etc., about 9 acres of land adjoining the Glyntaff cemetery, Treforest, for the burial board. Drawings and specification at the office of the architects, A. O. Evans, William, and Evans, Pontypridd, and bills of quantities on deposit of £2 2s. Tenders, endorsed "Cemetery Extension," by March 8, to James E. Spickett, clerk to the burial board, Pontypridd.

March 9. LEEDS.—Supplying the following during the year ending March 31, 1910, for the corporation:—Cement, sewer ironwork, sewer, and drain pipes, gullies, etc. Specifications and forms of tender with W. T. Lancashire, city engineer, municipal buildings, Leeds. Tenders to the town clerk, town hall, Leeds, by 10 a.m., on March 9.

March 12. ROMNEY MARSH.—Stopping and lime-washing the workhouse and buildings for the guardians. Forms of tender can be obtained upon application to the master of the workhouse at New Romney. Tenders to be submitted by March 12.

March 19. SUTTON COLDFIELD.—Supplying following materials during year ending March 31, 1910, for the corporation:—Granite macadam kerb, limestone macadam and setts, gravel and broken pebble stones, Yorkshire or Pennant kerb, Rowley setts, earthenware pipes, cement and lime, iron castings, iron and steel, timber, hardware, oils and paint, bass brooms. Conditions of contract and forms of tender of W. A. H. Clarry, A.M.Inst.C.E., borough surveyor, council house, Sutton Coldfield. Tenders by March 19, endorsed "Tender for Materials."

THE
Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
30, Cross Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ADVERTISER (28), seeks re-engagement, ten years' thorough practical knowledge of building, estate management, and repairs, etc.; experienced in preparing plans and estimates, including quantities, for new works: highest refs. — Y., 86, Coniston Road, Muswell Hill, N. 4805

ADVERTISER (27), Architect and Surveyor, recently returned from Sudan, after completing engagement, desires position as architect or manager to building estate.—Baratt, Hollyrood House, Gravelly Hill, North, Birmingham. 4842

ARCHITECT'S Assistant desires engagement, finalist R.I.B.A.; design, details, specifications, 1st class honours, quantity surveying, honours (Part 1), building construction, artistic and practical; moderate salary.—Address Architect, 24, Brunswick Street, C.-on-M., Manchester. 4871

ARCHITECT'S Assistant (23), excellent Draughtsman, desires re-engagement; London preferred; six years' first-class experience town and country work; contract, detail, and competition drawings; exhibitor Royal Academy; Prizeman for Architectural Design; small salary.—F. E., 10, Cobham Road, Kingston-on-Thames. 4876

ARCHITECT'S Assistant (23), desires engagement; 7 years' eaxperience.—Sedgwick, Belvedere Road, Sunderland.

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECTS, Builders, etc., draughtsman (19), used to general work, fill up time in office; good references.—F. J. Williams, c/o F. Cundall, Architect and Surveyor, 34, Parade, Leamington Spa. 4878

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. 4888

ARCHITECT'S good all-round Assistant; 10 yrs.' exp. North, South, and Wales; quans., details, working drawings; mod. salary.—W. T., 14, Stanhope Road, Stockton-on-Tees. 4798

ARCHITECT'S Assistant, 23, 6 years' experience in various London offices, good references; moderate salary.—G.O.E., 72, St. Ann's Hill, Wandsworth, S.W. 4881

ARCHITECT and Surveyor's Assistant (21), seeks re-engagement; 5 years' experience in church and domestic work in larger provincial office; good draughtsman and colourist.—Box 4823, Builders' Journal Office.

ARCHITECT'S Junior Assistant (19), 4 years experience in West End Office, working drawings, details, perspectives, competitions, excellent references; salary 21s.—Box 4777, Builders' Journal Office.

ARCHITECT'S and Surveyor's Assistant, 15 years' good practical experience; excellent draughtsman, designer and colourist; working drawings, details, specifications, surveying, levelling and general routine; excellent references; moderate salary.—A. R., 1, Ivy Villas, Cheam, Surrey. 4862

ARCHITECT'S, Surveyor's or Builder's Assistant (23), Inter.R.I.B.A., good draughtsman, levelling, surveying, specifications, assist quantities, supervision, estate work, correspondence, accounts; excellent references; moderate salary.—H. O'R., 80, Lavender Sweep, Clapham, S.W. 4810

ARCHITECT'S Assistant, thoroughly experienced, temporary employment; domestic work, business premises, schools, etc.; surveying and levelling, etc.; two years' experience in Structural Engineer's office; salary moderate. — Box 4820, Builders' Journal Office.

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

ARCHITECT, estate agent, or builder's assistant, experienced in all branches; good references.—R. S., Eagle House, Marine Parade, Clacton-on-Sea. 4816

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, Builders' Journal Office.

ASSISTANT Draughtsman disengaged, student R.I.B.A.; prizeman in classic and mechanics, A.A.; good all-round London experience; salary 20s.—148, Shooter's Hill Road, S.E. 4864

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

BUILDERS' Assistant desires situation; thorough knowledge plans, specifications, quantities, measuring; not afraid of work; salary not so much an object as permanent situation; 21; 5 years' experience.—Box 4839, Builders' Journal Office.

BUILDER'S Assistant or Manager; thoroughly efficient; moderate salary if prospect of hard work and exceptional ability being recognised; 23 years' experience.--Alpha, 191, Park Crescent, Grimsby. 4877

BUILDERS', Surveyors' Assistant (24), capable and reliable, seeks re-engagement, thorough practical knowledge of construction, surveying, measuring up, good draughtsman, supervision, also costs, accounts, wages, etc.; mod. sal.—Box 4841, Builders' Journal Office.

BUILDERS' Assistant desires work; plans, estimates, setting out buildings, measuring up, prime costing, surveying, and levelling plots, ordering exact quantities, materials; 11 years' experience.—Box 4803, Builders' Journal Office.

BUILDER'S or Architect's Junior Assistant (18), good tracer, well up in prime cost, and general office work; excellent references; three years' experience. — J. W., 164, Wellesley Road, Ilford, Essex. 4833

BUILDER'S clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N. 4883

CLERK of Works seeks re-engagement; just finishing public building; varied experience, notably ferro-concrete construction; well recommended; testimonials most excellent; age 45.—A. B., Box 4814, Builders' Journal Office

DRAUGHTSMAN (junior), 5 years' experience in structural engineers, good knowledge of constructional and ornamental work, details, quantities and estimating; shop experience.—M.D., 74, Bartholomew Road, London, N.W. 4884

DRAUGHTSMAN, neat, quick tracer, working drawings from rough sketches, good colourist; shorthand, typing, etc.; about 12 years' varied experience; terms moderate.—Box No. 4889, Builders' Journal Office.

ESTATE, **Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.**

ESTATE Owners.—Bricklayer, all-round, stone-waller, and general repairs; abstainer; good references; moderate wage for permanency.—Quinton, 12, Holland Road, Aston, Birmingham. 4802

FIREPROOF **Engineers and Concrete Specialists. Advertiser, connected with above trades for 10 years, and whose name is well known in connection with same, desires position as manager, traveller, or head clerk; first-class book-keeper; aged 33; very moderate salary.—P. W. Potter, 73, Penshurst Road, Thornton Heath. 4719**

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, Builders' Journal Office.

FOREMAN Painter (working) seeks re-engagement); experienced in all class work in building trade, as for general alterations, etc.; good supervisor, and reliable; either town or country; abstainer.—X. Y. Z., 8, Barton Street, Westminster. 4807

GENERAL Foreman seeks re-engagement, thoroughly practical in all branches; trade, carpenter and joiner, good draughtsman, first class references; town or country.—A. J., 196, Murchison Road, Leyton. 4804

GENERAL Foreman seeks re-engagement; alterations or new, practical experience in all branches; carpenter and joiner; good references; age 36; moderate wages.—Caplen, 3, Victoria Mansion, Edgware Road, Paddington, W. 4779

GENERAL Foreman seeks re-engagement, thoroughly practical and reliable; new or alterations; carpenter and joiner; life abstainer; first-class references.—Foreman, 3, Hawbridge Road, Leytonstone. 4787

GENERAL or builder's foreman, energetic, reliable, good timekeeper, trade bricklayer; age 32. Good refs.—G. C., 44, Richmond Park Road, Kingston-on-Thames. 4863

JUNIOR **Assistant desires situation, home or abroad; good practical knowledge of construction and details; competent draughtsman and colourist, working drawings, measuring and supervising, surveying and levelling; moderate salary.—Box 4613, Builders' Journal Office.**

MACHINIST seeks situation; spindle fourcutter, etc.; married, age 32; total abstainer and good timekeeper.—Machinist, 46, Priory Street, Tonbridge, Kent. 4874

PAINTING, paperhanging, distempering, graining wanted, piecework, new work at greatly reduced prices; specimen showing architects' and surveyors' testimonials for quality and cheapness.—Galton, 6, Parolles Road, Upper Holloway, N. 4861

PLASTERER, good jobbing bricklayer, roofs, fire work, stoves, tiling, etc., etc., generally useful, good reference, moderate wages, non-union.—A. Trigg, 117, St. John's Hill, Clapham Junction, S.W. 4856

QUANTITY Surveyor's Assistant (21), 4 years' experience, desires engagement, certificates and good references. — Apply Box 4745, Builders' Journal Office.

QUANTITY, General Surveyor's Junior Assistant, four years' experience; working up measuring existing buildings, good draughtsmen, little estate work; City Poly student.—J. R. O., 233, Essex Road, N. 4844

REINFORCED CONCRETE.—Details, drawings, calculations, and assistance generally, rendered to architects, builders, etc., by a specialist of large experience; terms moderate.—Box 4887, Builders' Journal Office.

SURVEYOR'S Assistant seeks re-engagement, 9 years with City firm; highest references; surveys; levels, estate management, etc.; shorthand and typewriting, if necessary. — J. P. K., 21, First Avenue, Manor Park, Essex. 4873

TO Estate Owners, builder, experience, in all trades, desires position as manager (working or otherwise); plans prepared, quantities, setting out, accounts and supervision; abstainer; country preferred.—Box 4806, Builders' Journal Office.

VOLONTAIRE.—Foreign gentleman (21) desires position in builder's office, with opportunity of learning.—B. B., 43, Bolingbroke Grove, Wandsworth Common, S.W. 4789

YOUNG Gentleman, with good business pushing qualities, wants situation, experienced buyer in quick selling lines; timber, matchings, joinery, mouldings, etc.; building materials, ironmongery, oils, colours, glass, garden requisites, practical experience, good references; will manage small cash business and develope it. — Box 4872, Builders' Journal Office.

Appointments Vacant.

ARTICLED Pupil, reinforced concrete. Required, a young gentleman as articled pupil in reinforced concrete specialist's office; one with knowledge of Elemen. Applied Mechanics and mathematics, and a taste for theory of construction and design preferred; an excellent opportunity for one willing to learn and understudy chief engineer.—Write, R.C., c/o Hastings Bros., Ltd., King's Chambers, Portugal Stret, W.C. 4886

PARTNERSHIP.—Builder and contractor (established), employing workmen for all trades, at present engaged in developing the town council's new estate in an important and flourishing seaside resort on East Coast, requires experienced young man (some capital necessary), for a partner.—Apply first (in confidence) with particulars to Box 4870, Builders' Journal Office.

WANTED, young engineer for abroad; knowledge and experience of reinforced concrete and constructural engineering essential; commercial experience an advantage; good prospects for a suitable man. —Reply, with full particulars, to Z.Z., 407, Messrs. Deacon's, Leadenhall Street, E.C. 4866

WANTED immediately, one or two good men thoroughly experienced in composition floor-laying. —Apply, giving experience and wages required, Box 4860, Builders' Journal Office.

March 10, 1909. Volume 29. No. 10.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: Government Fair Wages Clause; The Building and Engineering Works Bill; The Guild of Architects' Assistants, 199; Porosity and Paradox; Borough Surveyor as Architect - - - - - - - - - 200
Royal Academy Exhibition - - - - - - - 201
Guild of Architects' Assistants: Inaugural Meeting - - - - - - - - - - 202
Correspondence: Echo in Assembly Hall; The Stability of Walls - - - - - - - 204
Notes on Competitions - - - - - - - - 205
Our Plate - - - - - - - - - - - 205
Brass Gates for the Maharajah of Mysore - 205
Enquiries Answered: Local Authority's Rejection of Plans; Workmen's Compensation, 205; Right of Light; Width of Timber for Curved Braces; Design for Braced Collar-beam Roof; Cause of Floor Decaying; Fall Required in Pipe; Pressure in Water Main; Reservoir Wall, 206; Building Contracts; Procedure for Church Committee; Points in Fire Insurance - - 207
Diagonal Truss to Square Roof - - - - - 208

CONTRACTORS' SECTION.

"Applications" under the London Building Act. By B. Wyand - - - - - - 209
Fair Wages Clause in Government Contracts 211
Finchley Garden Village - - - - - - 212
Proposed New Works - - - - - - - 212
Notes on Bricks and Brickwork. By Alfred B. Searle - - - - - - - - - - 214
The Forthcoming Building Exhibition - - 214
Obituary - - - - - - - - - - - 215
A Timber Stage. By Hugh S. Cregeen, A.M.I.C.E., etc. - - - - - - - - 216
Rosyth Granite Contracts - - - - - - 216
Law Case - - - - - - - - - - - 216
Views and Reviews - - - - - - - - 217
Trade and Craft - - - - - - - - - 217
Coming Events - - - - - - - - - - 217
National Federation of Building Trades Employers: Official Reports - - - 219-224
Federation Topics: Hoarding and Fencing Case; The Anomalies of Walking Time - 225
The Uses of Advertisement - - - - - 226
Tenders - - - - - - - - - vi., viii.
Complete List of Contracts Open - - xxi., xxii.

ILLUSTRATIONS.

Brass Gates for the Mausoleum of the late Maharajah of Mysore. Made by Tonks, Ltd. - - - - - - - - - - 201
House at Balcombe, Sussex. Lawrence L. Pearson, Architect - - - - - 203, 204
Timber for Curved Braces - - - - - 206
Reservoir Wall - - - - - - - - - 207
Diagonal Truss to Square Roof - - - - 208
Finchley Garden Village. Bennett and Stratton, Architects - - - - - - - 212, 213
General View of the L. and S.W.R. Dock Extension, Southampton. Topham, Jones and Railton, Architects - - - - - 215
A Timber Stage - - - - - - - - - 216
Elliott's Improved Revolving Door - - - 217
The Smoke Blow-down Preventer - - - 218
The Palazzo Nobile, Montipulciano. Drawn by Leslie Wilkinson, A.R.I.B.A., Centre Plate.

Government Fair Wages Clause. We draw attention to an article which appears on page 211, dealing with the resolution to be moved in the House of Commons to-night (Wednesday) by Mr. Hodge, M.P. Like many other resolutions that are brought before our legislative bodies, this motion is very drastic, or is badly drafted. The intention is either to force contractors for Government works to pay the rates of wages dictated by the various trade unions, whatever figures they may decide upon, in which case the rates of wages agreed upon between masters and men will, so far as Government work is concerned, be swept aside; or there is a desire to make all contractors conform to the agreed rates, in which case the motion is badly drawn, and liable to be productive of disputes over the exact meaning, among other things, of the words, "Trade Societies." Moreover, the motion would override the main conclusion of a report recently rendered by a Treasury Committee appointed to consider the working of the Fair Wages Resolution of the House of Commons, of February 13th, 1901. It is to be hoped, therefore, that the present fair wages clause employed in Government Departmental contracts will be retained. To do otherwise is to stultify the careful consideration and recommendations of the Committee referred to for no appreciable benefit—unless it be to the trades unions. And in such case to bring forward this motion at a time of acute depression seems likely to frustrate its object. With prices so low and so little work going, it is too much to expect that a provision which must increase the cost of building at any rate, will result in an increase of work and wages.

The Building and Engineering Works Bill. "The Building and Engineering Works Bill," or as it was termed last year on its first introduction, "The Building Operations and Engineering Works Bill," has again been presented to the House of Commons by Mr. Secretary Gladstone. On this occasion it is seen that the name of Mr. Herbert Samuel, the Under-Secretary for the Home Office, is concerned with its re-appearance, and this probably means that a determined effort is to be made to pass it on this occasion. A comparison of the present Bill with that of last year reveals a few alterations in the drafting, but they are chiefly those which would appeal to a grammarian. The object and administration of the proposed Act are, however, chiefly worth our notice, and in these respects no particular change is to be recorded. The principal alteration is undoubtedly that the power to act on Crown buildings is not to be transferred to the local authorities as is proposed for works in general. We disagree entirely with the intention to hand over to the District Councils any of the powers so proposed, on the grounds which we have already expressed in these columns, viz., that a danger of local influence will creep into local administration, and also that consistency of inspection can only be gained by centralisation of authority. It is true, as Mr. Samuel pointed out when presenting the Bill, that the factory inspectors have power to act in default of the local authorities, but that they, in the multiplicity of their duties, will do so, we decline to believe. But supposing we are in error, a question is raised which from the builders' point of view is of extreme importance. Is the trade to be inspected by local inspectors and again by the Home Office inspectors in order to ascertain that the district official is doing his duty? This is harassing with a vengeance, and the Home Secretary should be aware of the fact.

The Guild of Architects' Assistants. At the meeting of Thursday week last, reported in the present issue, the new Guild of Architects' Assistants was formally ushered into existence. We heartily welcome the new body, and sincerely trust that it will solve successfully the many and difficult problems that lie before it. Mr. Ernest Dixon, the indefatigable organiser of the new movement, propounded at some length the objects which he and those with him, had in view; but at the moment it is impossible to fully realise the extent and probable effect of this programme, which may indeed be modified and improved by the provisional committee which was then appointed. Still, as accessories before the fact (for the new body appears as the result to some degree of the recent articles and discussion in our columns on "The Architectural Profession of To-day") we should like to emphasize one or two points that were brought up in the course of the evening, and which, we think, should have due consideration in the councils of the Guild. They arise mainly from Mr. Max Clarke's remark that the ruling policy of the R.I.B.A. was "Architecture as an Art;" of the Architectural Association—Education; and of the Society of Architects—Registration. Mr. Dixon, in his opening speech, appeared to deprecate a consideration of "Architecture as an Art;" and we should be loth to support any policy that dethroned architecture from the position, not merely of an art, but of mother of the arts. That may seem to many to be an unattainable ideal; but certainly it is one that all architectural societies and, most of all, new societies, should foster. These three propositions—"Architecture an Art," Education, and Registration—are not really inimical to each other; it is the narrow interpretation which controversialists have placed upon them that divides the architectural profession into warring and opposing camps. Apparently, if we follow the principle of architecture as an Art, and we desire to do so, we are at once confronted with implied, if not expressed, propositions that the artist is exempt from, or should be oblivious to, the material necessities of his fellow-men; that unfair competition and harassing conditions of life and employment must necessarily be his portion; and that the way to great art is along a road strewn with wasted hopes and wrecked lives. Nothing may be done to limit numbers in an already overcrowded profession by the imposition of a severe test of general culture and technical knowledge as a condition of admittance to its ranks; no effort may be made to limit competition to the fair rivalry of brother artists; and no conditions may be laid down to render more amenable the lot of the assistants and budding architects who are striving for an honourable place in the exercise of their art. We hold with no such conclusions. The times have changed and require stronger measures, and we have to deal with the practical necessities of the day. The paternal guidance of the Old Crafts Guilds and the helpful interest of the Mid-Victorian principal have long ago been swept away. To-day many offices are run entirely with pupils, who, when time-expired, are turned out to make way for others. Assistants are taken on for some special work in hand, and, this completed, are dismissed once more to swell the ranks of those in casual employment. The old bohemian *camaraderie*, as Du Maurier depicted it in the Latin Quartier, has practically disappeared here, and in architectural circles never existed. Small wonder then that the assistants should be driven to combination to defend their interests and grapple with abuses which fairly threaten to drive them into the ranks of casual labourers. For such evils, and to check the overflowing stream of newcomers into an already overcrowded profession, registration has been prescribed as a potent remedy. By closing the gates, the leaders will be enabled to supervise those within, and regulate the admission of others without. By registration the predominance of the leading men would in no wise be disturbed. The fact that there are thousands of general medical practitioners throughout the country in no wise lessens the necessity for specialists in Harley Street, or the wisdom of keeping the medical profession a closed one. The unknown barrister defending some hapless prisoner at the request of an assize judge cannot dim the lustre that attaches to the leaders of his profession. Registration does not, and necessarily cannot, regulate genius, but it can supervise mediocrity and exclude incompetence. It deals and aims to deal with material interests; and it is the obstinate refusal of a certain section of the body politic to recognise the existence of a material side to the architect's life that militates against the introduction of the inevitable remedy. Starving genius has proclaimed itself from the garret; but the romantic instances recorded were never architects, and seldom sculptors. The architect's work is too long and too slow in doing, and no good result can be expected unless he is enabled to live under reasonable conditions of comfort.

Porosity and Paradox.

Dr. James Braithwaite, M.D., has contributed to the "Evening News" an article on "Damp in the Home," to which title the sub-editor (apparently, for your newspaper sub-editor dearly loves a paradoxical caption) has made the addendum, "Why Wet Clay Means Dry Walls." Rooms added to the doctor's house in 1873 are damp. The bricks in this addition are, "to the eye, faultless, having smooth, almost shining surfaces, and sharp clear-cut edges and corners." Yet the rooms are exceedingly damp, and the doctor explains that "the damp comes through the walls, not up from the ground." The main building, however, which was put up in 1865, and is of bricks that were "machine-made from damp clay," is dry and comfortable; but its north wall "is damp, or becomes so in any place against which an article of furniture is placed, showing that the bricks always contain moisture, and are only not visibly damp on account of constant evaporation into the house." The doctor mentions similar cases that he has observed; and he thinks that they all tend "to prove the water-carrying power of bricks perfect in appearance." "I believe, however," he adds, "that this porosity or sponge-like character is only found in bricks made from merely damp clay, and never in those made from really wet clay," because, "however great the pressure, it is impossible to squeeze out the air which remains in the minute hair-like canals which represent the old lines of separation between the bits of dryish or damp clay of which the brick was originally composed. The smaller these canals the more deadly they are, for they absorb by capillary (*capilla* a hair) attraction quicker and more certainly. No house built of wet clay bricks is damp, owing to the important fact that they are not porous and are damp-proof." We by no means assent to the doctor's conclusions; which, indeed, were promptly challenged by Mr. Arthur E. Brown, B.Sc., who points out, what must be perfectly obvious to the expert reader, that the dampness observed is not due to the porosity or permeability of the brick, but rather to the opposite quality, which Mr. Brown aptly describes as "lack of breathing power." The dampness is no doubt condensed from the internal atmosphere; and, obviously, the more impervious the brick, the less the evaporation. Similarly the water that almost streams down inside shop windows during the cold weather is not a proof of the porosity of the glass, but of the converse. Among architects it is simply a commonplace of elementary knowledge that the porosity of bricks renders the house healthy by providing it with a breathing apparatus, "analogous to the skin of the body, letting out noxious vapours and internal moisture, as well as letting in pure air from the outside;" while, as Mr. Brown observes, bricks, though made by the wet-clay process, may, if made of sandy clay, possess an open texture, and be so extremely absorbent that, when walls built with them are not exposed to excessive rains, and are protected by projecting eaves, they give off moisture with great rapidity after rainfall, so that the wet has no chance to reach the interior faces of the walls. The dampness that became visible on the doctor's north wall when an article of furniture was placed against it, does not, as he supposes, show "that the bricks always contain moisture" derived from outside, but rather that the furniture has stopped the pores by which the interior moisture would have been dissipated. These very elementary propositions having been established, it is unnecessary to go into the doctor's question as to the relative merits, from the hygienic point of view, of bricks made, respectively, from "merely damp clay" and from "really wet clay;" and the sub-editor's daring paradox expires heroically in the execution of its duty.

Borough Surveyor as Architect.

The latest instance of the friction that so frequently occurs in connection with official appointments comes from Loughborough, Leicestershire. At a meeting of Loughborough Town Council, Alderman Moss drew attention to a paragraph in the minutes of the General Purposes Committee relating to proposed alterations at the drill hall. Plans had been prepared by the borough surveyor, to whom it was proposed to allow a fee of five guineas. The alderman opposed the grant, as he considered that alterations to town buildings ought to be regarded as part of the surveyor's duties. The Mayor made the somewhat ambiguous remark that "this was not the surveyor's work, but was architectural work," whereupon the alderman retorted, "What is surveyor's work if it is not architectural? It should embrace all that sort of thing." This large generalisation did not find much favour. Another alderman said he "did not consider surveyors' work and architects' work were the same," and architects of the one part, and surveyors of the other part, will hasten to agree with him, although it is not easy to draw a very definite distinction. An architect is apt to plume himself on his skill as a surveyor, and, in revenge, a surveyor would scorn to think himself unequal to at least the minor operations of architecture. Each profession allows itself a sufficient amount of margin to permit of a certain amount of overlapping. The problem of whether a given official is more of the one and less of the other is far too subtle for solution by the average town councillor, or even an average alderman. One of the Loughborough councillors made a clean breast of his very pardonable ignorance by ejaculating, "I should like to know what his (the borough surveyor's) duties are." That is exactly the information for which we are all athirst. For our part, we see no reason to abandon our consistent contention that the function of such officials should be purely advisory and consultative; and therefore we take leave to say ditto to Councillor Phelps's protest: "I can't see why town officials should take away work from those outside who are capable of doing it." We are not sorry, however, that the minute was not referred back. As the surveyor had done the work, it was no more than just that he should be paid for it; although we must admit that our joy is somewhat chastened as we ponder the well-intentioned but desolating comment that an architect's fees for the work for which the borough surveyor was to be paid five guineas would probably have been £10. And why not guineas, Mr. Mayor?

New Council Schools, Barnsley.

The education committee invite application from architects desirous of taking part in a competition for the above schools, to be erected in Grove Street. Premiums, £30, £20, £10. Architects applying should submit particulars of school work already done. Forms of application can be obtained from W. P. Donald, secretary, education office, Barnsley, to whom they should be returned not later than Saturday, March 13th, 1909.

* * *

Messrs. Frederick Wheeler, Son and Searle are removing from 6, Staples Inn, London, W.C., to No. 7, Stone Buildings, Lincoln's Inn, London, W.C., to which address all communications should be sent after March 11th.

* * *

Mr. Edward P. Warren, F.R.I.B.A., F.S.A., is moving his offices from 20, Cowley Street, Dean's Yard, Westminster, to 20, Bedford Sqaure, W.C. (telephone 11897 Central), on and after March 22nd inst. His present offices will be closed during the 19th and 20th inst.

ROYAL ACADEMY EXHIBITION, 1909.

The day for sending in architectural drawings to Burlington House is Friday, March 26th, from 7 a.m. to 10 p.m. As in past years we shall be happy to act as agents for delivering drawings to the Academy on the condition that we are allowed to reproduce any of the designs passing through our hands prior to their being sent in. We should appreciate the kindness of architects in forwarding their drawings as early as possible, and would mention that we can obtain more satisfactory results in the reproduction when we have plenty of time at our disposal.

Drawings for exhibition in the architectural room should be glazed and should have gold frames. Each frame must have a ticket pasted on the back, giving the number, title of the work, and the architect's name and address, to correspond with the particulars given on the printed forms, which must be obtained from the secretary at the Royal Academy, Burlington House, Piccadilly, W., and there should be attached to each frame, by string, a printed label (also supplied by the Academy) so arranged that it may hang over the front of the drawing. The printed form of advice should in all cases be forwarded to us to hand to the secretary on delivery of the drawings. No exhibitor may send more than three works, and we should recommend intending exhibitors to avoid wide margins or mounts to the drawings, as space is a considerable factor in the arranging of the architectural exhibits.

GUILD OF ARCHITECTS' ASSISTANTS.

Inaugural Meeting.

A meeting of architects' assistants, for the purpose of inaugurating a guild for themselves, was held on Thursday week last, at the Tudor Hotel, Oxford Street, W., Mr. A. W. S. Cross, F.R.I.B.A., presiding over an excellent attendance.

Mr. E. J. DIXON, called upon by the Chairman to give a statement of the proposed constitution and objects of the Guild, said that all the existing architectural societies dealt primarily with the interests of the principals. The object he had in bringing forward the proposition for this Guild was to suggest some means of entirely reorganising the conditions under which the profession at the present time was carried on, with especial reference to the needs and wants of the assistants, and in bringing forward this Guild the idea was to combine for their own support, to better their conditions, to insure against the natural contingencies that their business brought with it, and at the same time to take up a broader point of view than that, and endeavour to show to the profession at large that an entire reorganisation was necessary, and that there was a competition between professions as well as between individuals. Any attempt at combination would evoke the remark, "Trade Unionism," and the two pet theses which were discussed *ad libitum* in the architectural societies, *i.e.*, architecture as an art, and education, would be brought against them at once. His private opinion of these two matters was that, however much they might respect the men who brought them forward, they must recognise the fact that architecture as an art was a purely abstract matter, and that any guild or combination of societies would not devote itself to the study of abstruse metaphysical questions such as that, but would direct its attention to the actual, practical conditions under which architecture was carried on at present. That would be the primary position of the Guild. It would take a broad outlook over the entire profession, and would recognise that what resulted in the betterment of the conditions under which the principal worked would inevitably react upon the assistants. He proposed, therefore, in framing the Guild, not to adopt trade-union tactics in any way, by creating two entire divisions in the profession, *i.e.*, the employers and the employed, but to take a larger outlook than that, to recognise the difficulties that the employer had to meet with in his practice. If those difficulties were properly met, the resulting conditions would benefit the assistant. He, therefore, formally stated the objects of the Guild in this manner: they were to unite all sections of the profession for mutual aid in progress and organisation, to form a common ground for the consideration of all questions dealing with the mutual relationship of the assistant and the principal, to assist its members in matters of improvement in their professional education, and in maintaining and improving their professional status. In the matter of education, they had had all sorts of complicated schemes which had never gone down to the root of things. It was a common thing to find that men who had passed examinations were not always by any means the best assistants. They as assistants had views on education of their own which had never been put forward, and which were likely to make assistants much

BRASS GATES FOR THE MAUSOLEUM OF THE LATE MAHARAJAH OF MYSORE. MADE BY TONKS AND CO., LTD. (See p. 205).

more useful to their principals, and to develop assistants on lines of their own, and at the same time be of more use to them if they should eventually attain to the happy heaven of a private practice than any of the present systems of education. That was an important point, and he thought if the Guild were formed it should direct itself to this problem. The constitution of the Guild he proposed in this manner. It was to be divided into branch societies, consisting of not more than 200 members in each, and governed by an executive council sitting in London, the architectural societies to be invited to send a representative to the executive council, and, in the case of branch committees, any local architectural societies to be similarly invited to do so; in the case where the invitation of the Guild was refused or met with no response, the vacancies to be filled by members of the general body. The executive council and all committees to be formed of principals and assistants in equal proportions; when the former were not available, their seats to be taken by assistants. In cases where a principal was not available within the Guild for election, and he had intimated his desire to assist in the work of the executive or the branch committees, he might be elected or co-opted by the existing council or committee, should continue in office for one year, and have equal voting power with his colleagues for that time. On the question of membership, any assistant who had held his present position or been in employment for nine months, was under forty years of age previous to entry, and could produce a certificate of good health from a duly appointed medical officer, could join, the membership being divided into three classes or more. The main point which developed the idea of a Guild was the question of a system of unemployment insurance. He had obtained from three or four insurance companies letters on this question, but most of them wanted a premium of 19s. 11d. in the pound, or said an insurance with that risk was impossible, so that the only thing he had to go upon was, not a system which was actuarially sound, but which was financially sound, and that was, perhaps, more important. One of the principal objects of the Guild in dealing with the question of insurance was also to deal with the question of employment generally, and here were some of the proposals with reference to employment. In each district he should advocate a branch committee, with each branch having about 200 members. The committee would manage an employment bureau, and lists of members requiring employment, together with their qualifications registered and guaranteed by the local guild committee. They would have in each district a body composed of principals and assistants, before whom assistants would place their qualifications, which would be judged in the order of age, capacity, personal references, and examination qualifications, and each candidate would produce before the Guild any evidences of his study and the manner in which he had occupied his time as an assistant, with the result that they would be able to get a guarantee of the capacity of each assistant from a recognised authority, and that, of course, would be to the interest of the principals. They often heard of principals who engaged assistants who were not quite what they wanted, but here they would have fuller information from people who had actually worked with an assistant, with the result that there would be a better guarantee. Employment advertisements could be answered by the Guild, and vacancies could be made known to the Guild by its members. Then the Guild could pay fares or advance any necessary money to members, providing, of course, that the funds permitted. His proposals in relation to unemployment insurance rested on this basis: in unorganised trades the present percentage of unemployment was 15 per cent., and in organised trades 8.5 per cent. They had, therefore, two points to bear in mind in forming the Guild. The first was to be careful to admit to membership only those men who were really capable assistants. There were two important reasons for that. The first was to properly fix the status of the Guild at a high standard, and the second was for financial reasons, because if the membership was composed of capable men, what he called the unemployed coefficient was correspondingly reduced. In the National Union of Clerks the unemployed coefficient, *i.e.*, the ratio of unemployed members to the total membership, had reached its highest figure in the present year, and that was 2 per cent., and that would indicate to them the manner in which unemployment in an organisation might be kept down. He proposed to build up a reserve fund for each class, the amounts varying according to the class, by means of entrance fees and the first year's or six months' subscription, and to gauge the subscription to this unemployment fund in such a manner that it would provide for a certain definite unemployed coefficient, which he proposed should be 4 per cent. The arrived at that percentage by careful comparisons with similar organisations. One of the principal objects of the committee to be formed would be to deal with the present business of the Guild, and at the same time to discover by every possible means what was the condition of the various centres in regard to unemployment. Taking a membership of from 400 to 500, roughly speaking, the total amount of contributions to the Guild would be as follows:—First class (salaries over 3 guineas), 6s. per month subscription; second class (from 2 to 3 guineas), 4s. per month; and third class (from 1 to 2 guineas), 2s. per month. In return for that they would be able to supply each assistant with 40s., 30s., and 20s. in the three classes respectively for a period extending over six months. If they found their unemployed coefficient lower than 4 per cent., the period might be extended to a year, but that was a matter for the committee. No financial benefits of any kind would be allowed until six months' membership was completed, when half benefits would be allowed, the full benefits being allowed after twelve months' membership. The object of trade unionism was to divide a trade into two classes, distinctly at war with each other, but the object of a Guild—and that was why he chose the title —was to take a wider outlook altogether, and to show that if the employer benefited in any way, that was likely to turn to the benefit of the assistant as well in the long run. He sent out a letter briefly stating the objects of the Guild, and suggesting the manner in which he should deal with the question of the organisation of the profession at large. In connection with this point, it could not be too much enforced upon them that the majority of the members of the existing societies were assistants, and that was important. If assistants combined with the object of improving the status of the profession, and necessarily, from the point of view of all impartial employers, improving their position as well, they would see what a tremendous impetus would be given to all those movements which had hitherto been attempted from the side of one or two particular societies. The four main objects of the Guild were these: the consideration of all questions concerning the relationship of the assistant to the principal, the institution of a system of unemployed insurance, to attempt the federation of all architectural societies, and to consider all practical and efficient measures for the protection of the profession. That seemed rather a large order. They knew that one society in particular had attempted something of that sort, but he thought where it had failed was that it had not sunk its own individuality as it should have done. It seemed to him that if an attempt was made by a society powerful in numbers and well represented by assistants, as assistants, to settle these questions of registration and education, and so forth, if they were represented on a federal council composed of representatives of all architectural bodies, the movement not being made on the part of any particular organisation, the organisation which endeavoured to engineer such a proceeding would sink its own individuality, and they would get a council which was truly representative of the entire profession without any stigma attaching to it in any way, and at the same time more capable of performing a useful and serious work than the present attempt could possibly be. Mr. Dixon then read letters of sympathy and criticism which he had received from the following gentlemen:—Mr. Barry Parker, Mr. E. A. Rickards, Mr. J. S. Gibson, Mr. Gould Wills, Mr. H. Clapham Lander, Mr. A. W. S. Cross (the chairman), Mr. Raymond Unwin, Mr. W. E. Riley, Mr. M. E. Macartney, Mr. R. S. Balfour, and the Architectural Association. Mr. Max Clarke wrote to the effect that he thought the proposed main objects of the Guild were rather outside the scope of such an association, which he thought should be confined to raising the position of the assistants, and generally assisting them in the sphere of their work.

Continuing, Mr. Dixon said he trusted the general objects of the Guild appealed to them all, and he thought, with a little advertisement and the necessary vigour, it should be an immense success.

Mr. A. J. PENTY moved the following resolution: "That the Guild of Architects' Assistants be formed, and that a provisional committee and officers be appointed to transact its business." He said that he was fully in sympathy with the idea of a Guild. There were a number of special things that they might deal with. If they could do something to stop the pupil system they would be doing a great deal. In proportion as architects had been getting hold of smaller work and the 5 per cent. had not been remunerative, they had had a system of men taking in pupils, and he thought that very probably many of their difficulties of the present day were due to that system. They could not deal with the question in the way of strikes, but if they could do something in the way of informing the public that architecture was not the soft job that they had thought it was, parents would not be so anxious to bring their sons up to the profession as in the past. He thought this Guild, in so far as it was a trade union, would do a great deal towards that. Personally, he would much rather the Guild were called a trade union frankly, because it would do more to break down prejudices against the profession than anything he knew of. It would, at any rate, break down the prejudice of the public bodies, where labour representation was getting a hold everywhere.

Mr. J. V. HIBBERT, F.S.I., in seconding the resolution, said that if they were successful in carrying out even a small portion of the results outlined, they would have every reason to congratulate themselves.

Mr. GOULD WILLS said he was the Secretary of the Architects' Technical Bureau. They were not a bureau in the sense of a labour bureau, but he had come in contact with a good many young men who had come to the bureau thinking it was in some way a means of getting in touch with an architect. When he heard of this Guild, it struck him whether in some way or other his bureau could be associated or federated with the movement, so that they might be of some service mutually. Anything that arose out of this meeting had got to have a financial backbone, and as his bureau was established and now pretty strong, it occurred to him whether it would be possible to think out a united scheme. They had been so busy at the bureau, however, that this question had not received much consideration at present, but there might be a possibility in it, and it might be worth while thinking about.

A gentleman asked if there was any restriction on candidates for membership of the National Union of Clerks, because, he said, it seemed to him that if they restricted the Guild to the better-paid and better-class assistants, they would be helping those who really did not want help. It was the "bottom dog" they wanted to help.

Mr. DIXON replied that in his scheme he had arranged for double the percentage, and, more than that, the unemployment scheme was based on the principle that if unemployment increased to such an extent that the minimum financial backing per member became decreased, a levy was to be made over the entire membership, and the amount of the levy would vary with the class to which a member was allocated. It would be seen, from the figure of 2 per cent. of unemployment in the National Union of Clerks, that very careful management must have been necessary. The Union had been in existence for 17 years, and yet their membership was only about 1,500, so that it could be seen easily that the unemployed coefficient being down to 2 per cent. showed what amount of care must have been taken in selecting members.

Mr. PENTY said he thought it was unusual for the better class assistants to be always in work. He thought it was the other way about. There were very few principals who could afford to pay a first-class assistant, and the consequence was that he remained out of a job, and the second-class man got the work.

Mr. DIXON, referring to Mr. Max Clarke's letter, said that if they wished to consider the question of the relationship of the assistant to the principal, they must necessarily consider the general circumstances under which the practice of the profession was carried on, and consequently all measures of restriction in the introduction of pupils. The idea of federating all the architectural societies was simply as a means of obtaining an impartial general council of the entire profession to carry out the objects of the Guild.

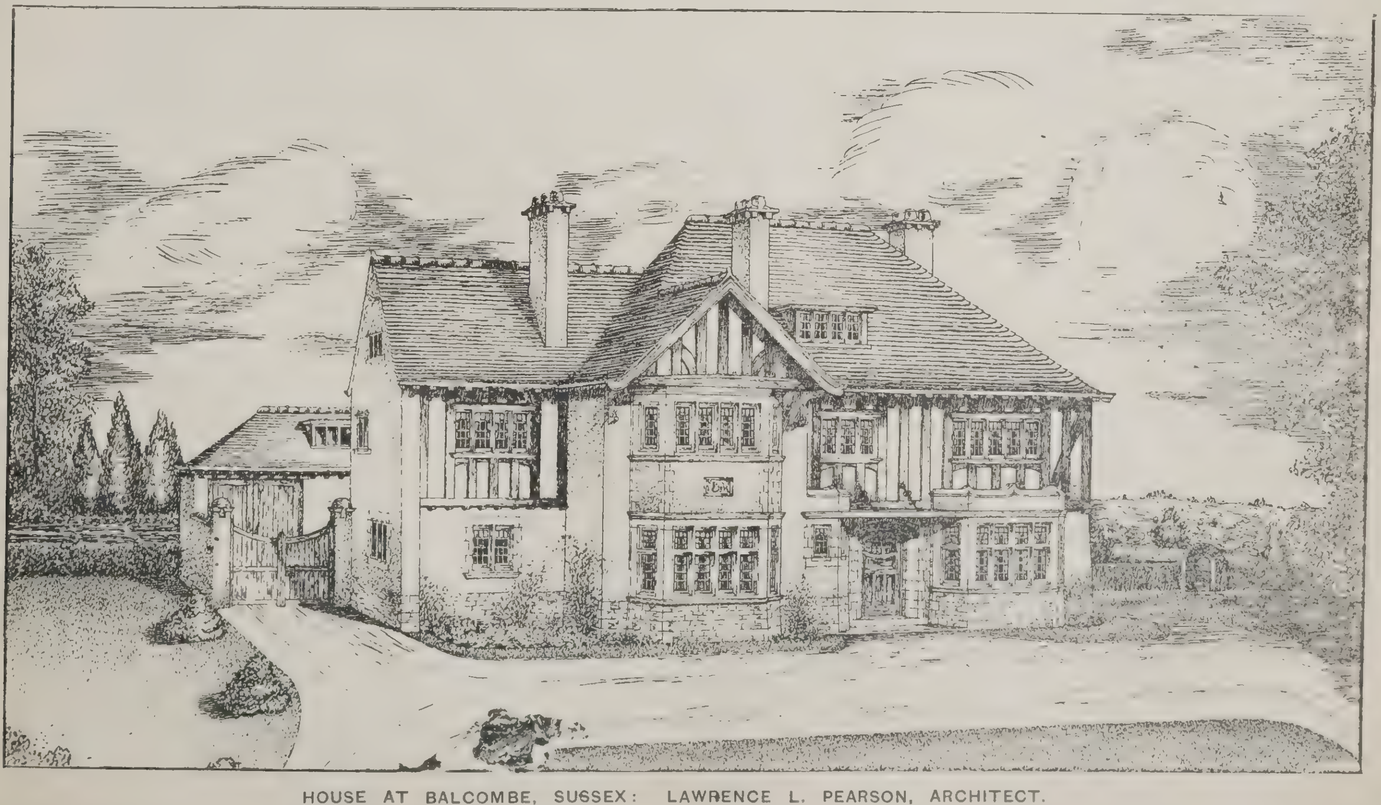
Mr. MAX CLARKE, called upon by the Chairman to address the meeting in amplification of his letter, said he had had the misfortune to be an assistant for 25 years. He thought that the youth of any generation wanted a certain amount of restriction put upon them, and his sole object in writing that letter was that, in forming this Guild, they should not upset anything or any set of people at present in existence. They all hoped to be principals some day, and the moment one became a principal he said to himself: "I am the person who is going to settle the relationship of my assistants to myself." He took it that if this matter was based on the consideration of all questions dealing with professional education, it would be perfectly in order, but when it came to the settlement of all questions between the principal and the assistant, he thought they were going rather out of their province. They were constituting themselves arbitrators, and naturally the principal would say he did not want an arbitrator between his assistant and himself. The provision of unemployment insurance was much to be commended; but the item to federate all the existing architectural societies was too large an order for a guild like this to dream of, because the various societies were more or less diametrically opposed to each other, and to hope for any federation was quite beyond the bounds of probability. With regard to the suggested object of considering all questions relating to the proper protection of the profession, if they had registration he thought something might be done in that direction, but without registration the question was as much in the air as that of federation. He was afraid the basis on which the unemployed fund was going to be worked was rather low; and he thought that the proposed limitation of the different branches of the Guild to 200 members was rather small for London, although he thought it would do very well in the country. As to the suggested federation with another bureau, if this Guild came into existence he recommended it to be entirely on its own bottom, and not to ally itself with any other society. People who leaned upon other people were of no use in the world.

Mr. PENTY said that one or two people to whom he had spoken had said that they had too much respect for themselves to join anything on a trade-union basis; and there was a strong feeling, he believed, that a "gentleman" did not do anything which the working classes did. It was that attitude of mind against which he protested; it was the "classy" feeling that did such a great deal of harm.

Mr. ELDER-DUNCAN said that, with regard to calling this society a trade union, he would remind them that there were such things as guilds in past ages, and as far as they could trace their history they combined the functions of an artistic profession and a trade union very successfully. Therefore, he thought that if they continued to adopt the word "Guild," they might in the same way combine an artistic profession such as architecture and a trade union very successfully. Mr. Dixon laid stress on the practical side of the architectural profession. It was a fact that the people who had the money, which they wanted for designing their buildings, had a great objection to the words "trade union"; one could not get away from that. It might be a wrong feeling, but the fact was that these people had that objection, and why they should stir it up unnecessarily by calling themselves a trade union he did not see. He thought for that reason also they should keep to the word "Guild." In conclusion, he said he had no doubt many of the points raised by Mr. Max Clarke were points to which the provisional committee when formed would devote itself first of all.

Mr. DIXON said that, with regard to the consideration of questions concerning the relationship of the assistant to the principal, he quite appreciated Mr. Max Clarke's objection. It was impossible, of course, to get a settlement unless the Guild was so effective as to include principals and assistants. As to the insurance question, this system was not an invention of his own, but it had been in existence in England for thirty or forty years, and from the financial status of the trades unions at the present time it had worked in a very flourishing manner. With regard to the federation of all the architectural societies, his idea was to get a sort of general council, at which all questions concerning the assistance of the profession generally could be discussed and solutions arrived at. Of course, it was in the air at present, but the great majority of the members of all these associations were assistants, and if they could make a direct appeal to the assistants in the United Kingdom, they would obtain a backing of membership of votes on all societies. He certainly proposed to stand on their own feet, and he did not propose to amalgamate in the way that had been suggested. He only wished to federate for certain definite objects, but he did not mean a general amalgamation of all architectural societies. As to measures for the protection of the profession, that was merely a crude way of referring to the question of registration to prevent continued influx into an already overcrowded profession.

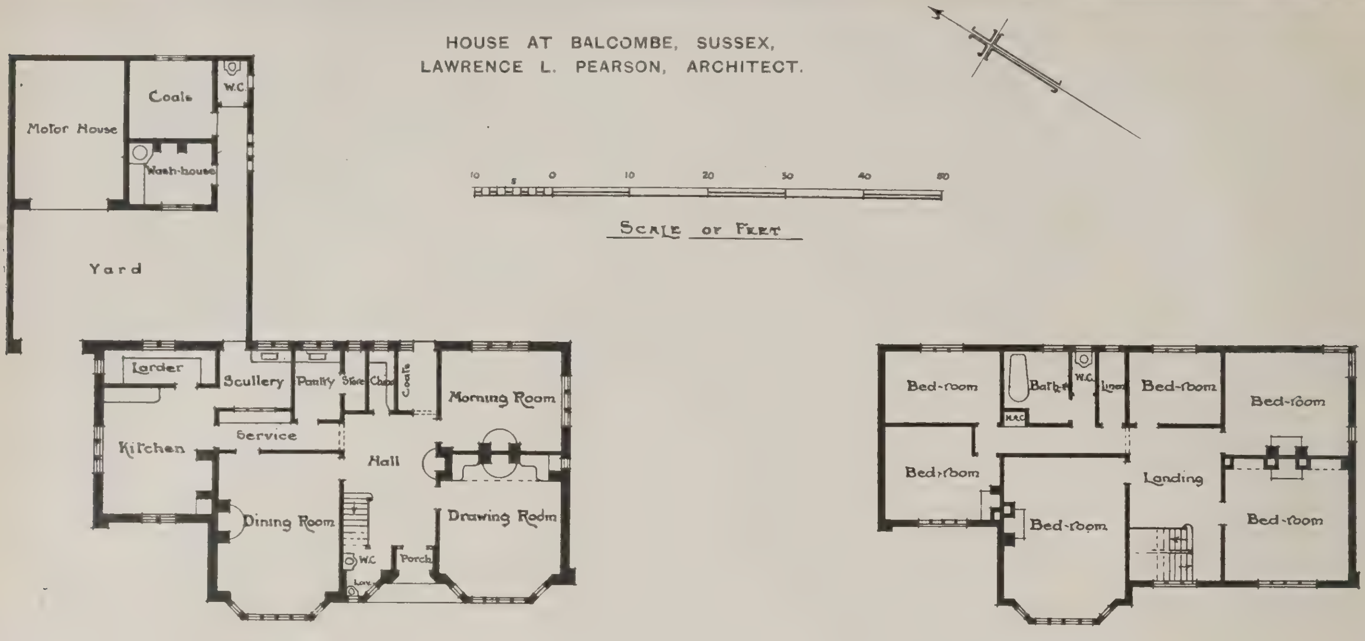
The CHAIRMAN said that a provisional committee would be formed, which would,



HOUSE AT BALCOMBE, SUSSEX: LAWRENCE L. PEARSON, ARCHITECT.

This house is to be built of brick, faced with white roughcast, with plinth of local rubble stone and the roof covered with dark red sand-faced tiles. The half-timber work is to be in oak, and the stone dressings to windows and front entrance are to be of Ancaster stone. Casements of wrought iron and windows glazed with lead lights.

HOUSE AT BALCOMBE, SUSSEX.
LAWRENCE L. PEARSON, ARCHITECT.



GROUND FLOOR PLAN

FIRST FLOOR PLAN

in view of Mr. Max Clarke's criticisms, go carefully into the questions as to the scope and objects of the Guild, and report again to a general meeting.

Mr. Penty's resolution was then put, and carried *nem. con.*, and the following gentlemen were appointed on the provisional committee, with power to add to their number, viz., Messrs. A. J. Penty, H. C. Lander, A.R.I.B.A., Barry Parker, W. Fullerton, J. H. B. Scott, Monro Wilson, H. C. Bishop, A.R.I.B.A., J. V. Hibbert, F.S.I., D. Milne, A.R.I.B.A., and E. J. Dixon (secretary *pro tem.*).

Mr. PINDAR asked if these gentlemen were all assistants.

Mr. DIXON replied that about three of them were practising architects.

Some discussion ensued as to the raising of finances for the preliminary operations in connection with the Guild's formation, and eventually the question was solved by those present contributing half-a-crown each as a subscription.

The matter having been settled, Mr. DIXON proposed a very hearty vote of thanks to Mr. Cross for his kindness in presiding over the meeting, and this was carried with acclamation.

In acknowledging the compliment, the CHAIRMAN said he believed and trusted that great good would result from the formation of the Guild.

A Town Advancement Association has been formed at Richmond, Surrey, for the purpose of directing and stimulating a more active effort on the part of its citizens to supplement the great things nature has done for the place. Working side by side with the town council, it aims at influencing public opinion in favour of wider and more beautiful streets on garden city lines, of rebuilding schemes in order to bring about the erection of better-designed structures, and to make Richmond a town of architecturally beautiful homes. The new association also aims to develop the resources of the borough in regard to music, art, education, and amusement. The mayor, Alderman W. Thompson, is president of the association; Sir James Szlumper, Sir Thomas Skewes-Cox, and Mr. George Cave, K.C., M.P., vice-presidents; and other workers are Councillor McDougall, Mr. Arthur Snow, Mr. Ernest Pennington, and the heads of the principal business houses. The secretary is Mr. Capel Smith.

Correspondence.

Echo in Assembly Hall.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—"E. N. D.," in your issue of February 17th, complains that "a hall like that shown in the plate given in 'The Builders' Journal' of December 23rd, 1908, has been found to possess an inconvenient echo." "E. N. D.'s" hall must be unlike the hall referred to—that of the Institute of Engineers and Shipbuilders, Glasgow—as it is entirely satisfactory in its acoustics, both for speaking and music. The dimensions there are 72ft. by 40ft. floor space, with elliptic ceiling rising from 15ft. 6ins. at wall head to 25ft. at centre.

The "hangers with angular boxes attached" have nothing to do with the acoustics, though probably they are not harmful. They are, as you rightly infer, electric light fittings, for the design of which we are not responsible. They are the production of a special scientific committee of the Institute, who had this department under their charge; but whatever one may think of the æsthetic result, they certainly light the hall effectively.—We are, sir,

JOHN B. WILSON AND SON.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The question raised by E. N. D., of Derby, in your issue of Feb. 17th, anent echo in hall with curved ceiling, is an interesting one to the profession. It is possible that the trouble is caused by the use of an unduly hard plaster for the ceiling. Would he mind describing the plaster actually used? I have erected similar halls without experiencing this trouble, but have always been careful to adhere to ordinary lime plaster. The ascertainment of the cause of the trouble should point the way to the proper remedy.

W. ROLAND HOWELL.

The Stability of Walls.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I was much interested in the description given by Professor Adams of the corrugated boundary wall at Easton Park.

I know of a yet more daring example of an unbuttressed corrugated wall of this type. It is at Darvell Hall, in Sussex. In this case the wall encloses a fruit garden, rectangular in shape, 98ft. by 76ft. The double-bend between tangent points measures 19ft., with a rise, like that at Easton Park, of 2ft., and the height is 8ft. The thickness of the wall is just half that at Easton Park, or 4½in. only.

Darvell Hall, originally known as Darvell Bank, is near Robertsbridge, and parts of the house are fully 200 years old. The wall referred to is, of course, much more recent, but the fruit-trees trained along it may well be fifty years or more old, and the wall is practically as sound as the day it was built.

Professor Adams's differentiation between counterforts and buttresses is interesting, and quite new to me. I take it that the distinction is quite a modern one, as it seems in no way borne out by the derivations of the words.

GEORGE HORNBLOWER.

London, W.

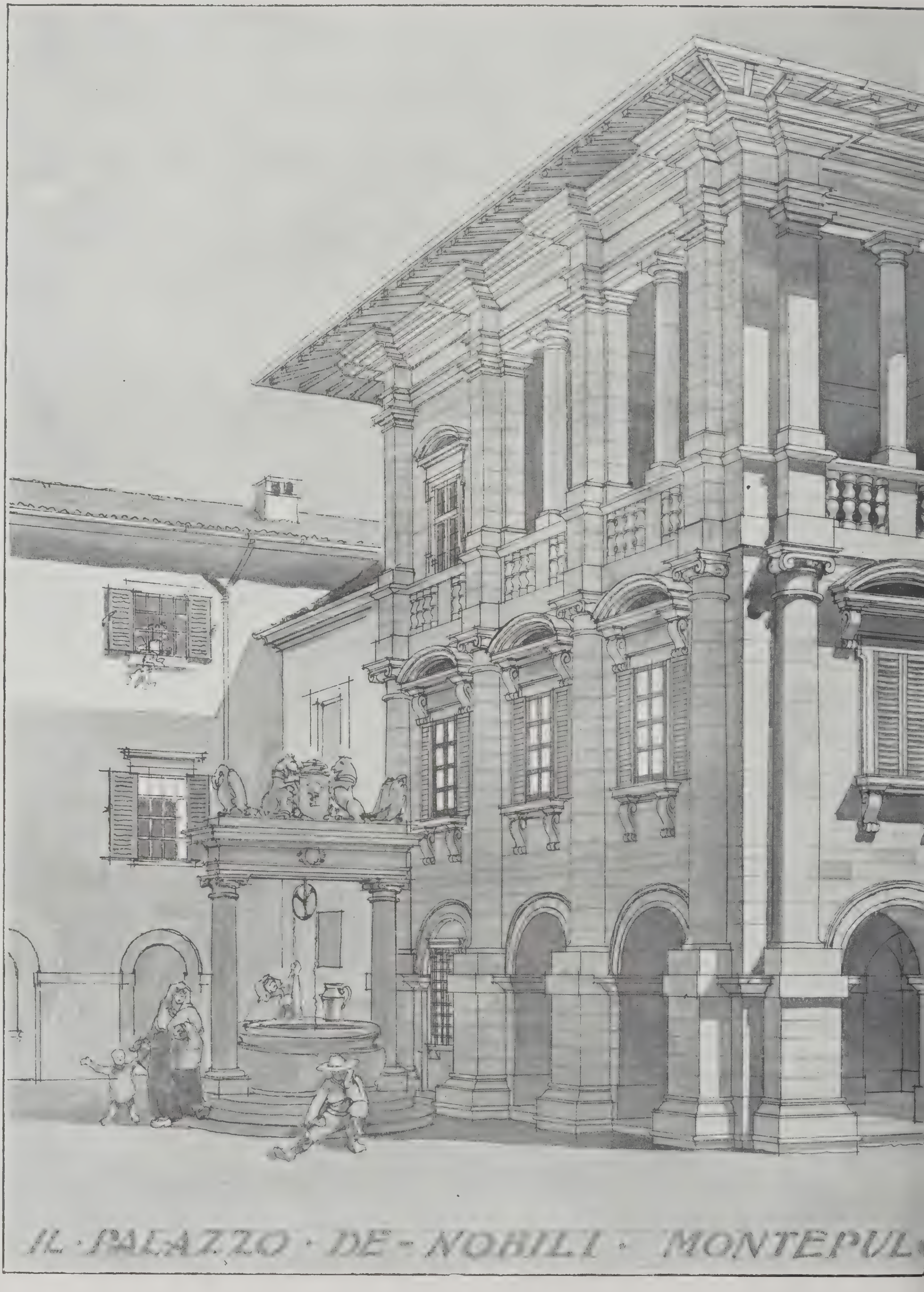
The scheme for new public baths at Preston, for which borrowing powers had been obtained, has been dropped.

* * *

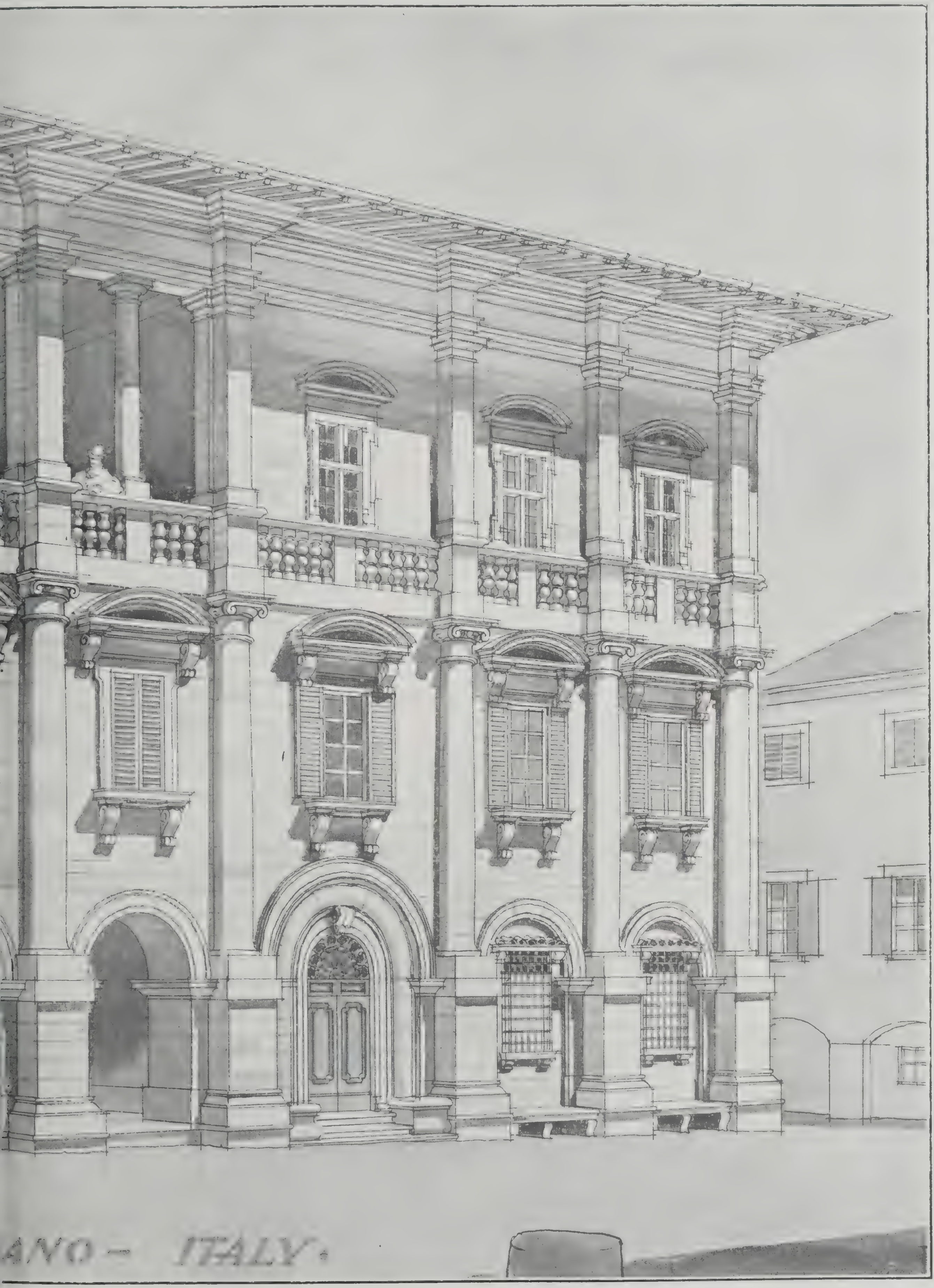
Mr. Percy Robinson (president of the Leeds and Yorkshire Architectural Society), in the course of a lecture delivered before the students of the School of Architecture at the Leeds Institute on "Some Modern Conditions of Architectural Design," emphasised the necessity of studying the great works of the past, pointing out that all art must be based upon what had gone before. At the same time he warned them of the danger of becoming mere archæologists, blinded by the glamour of historical associations; the mechanical reproduction of past styles would never produce a living architecture. Comparing the conditions under which architects work to-day and those which obtained in the early days of art, when the great masterpieces of architecture were produced, he pointed out the great difficulties and the many restrictions which the architect of to-day had to contend with, and the difficulty of reconciling many of these conditions with the artistic spirit. Dealing with some of the modern innovations, Mr. Robinson suggested that these would materially influence the architecture of the future. In conclusion, he recommended the students always to bear in mind the essentials and the highest ideals of their art, to tackle these modern problems, and to turn what might at first appear to be restriction into an advantage, to mould difficulties into success, and so triumph over imposed conditions.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Supplement to THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER. *Wednesday, March 10th, 1909.*



DRAWN BY LESLIE WILKINSON,



THUR CATES PRIZE, R.I.B.A. 1909.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Mar. 17	†NEW OFFICES FOR THE STANLEY U.D.C., DURHAM. Cost £3,500. Premiums £30, £20 and £10. Conditions, etc., to be obtained from J. G. Ridley, Clerk to the Council, Stanley S.O., Co. Durham.
Mar. 24.	HALL AT EASTLEIGH, HANTS, to be erected adjoining the Railway Institute for the L.S.W. Railway Co. Particulars and site plan from the Secretary, L.S.W.R., Waterloo Station, London, S.E. Deposit £1 1s. Designs to be sent in at 10 a.m. on date given,
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days.
April 10.	BOLTON BRANCH PUBLIC LIBRARIES. The Libraries Committee of the Corporation invite competitive plans from architects who have been principals in the County Borough of Bolton six months prior to the present date for Branch Public Libraries to be erected in the districts of Astley Bridge, Halliwell, and Gt. Lever. The plans and particulars may be obtained from Samuel Parker, Town Clerk, Town Hall, Bolton. Deposit, two guineas.
April 12.	ELLAND NEW SECONDARY SCHOOL. Architects having offices and practising in the West Riding of Yorkshire are invited to compete for the work in connection with the new Secondary School at Elland, and should apply for particulars to Mr. Leonard Clegg, Holiwell Green, near Halifax.
July 31.	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	BOURNEMOUTH BRANCH PUBLIC LIBRARY. Architects practising in the County Borough of Bournemouth are invited to submit designs for a new Branch Library at Boscombe. Particulars from Charles Riddle, Borough Librarian, Central Library, Bournemouth

† The Royal Institute advises members not to compete.

The Stanley U.D. Council Offices.

At the business meeting of the Royal Institute of British Architects on Monday, March 1st, Mr. K. Gammell (Associate) asked: "Whether, in view of the letter signed by Jos. Routledge on behalf of the Stanley Urban District Council, appearing in the BUILDERS' JOURNAL for 10th February, any steps have been taken by the Council (other than by publication of the notice in No. 7 of the Journal) to induce the members referred to, to observe the *esprit de corps* reasonably to be looked for from the members of this Institute, ; and, if not, whether steps will be taken to exercise a deterrent influence on members who enter competitions which are considered objectionable by the Council of this Institute."

In reply, Mr. Ernest George stated that the Council deeply regretted the circumstances referred to by Mr. Gammell. The question had frequently been discussed by the Council, and it was thought that they ought to be able to trust to the right feeling of members. The Council, he understood, were not at liberty to put coercion on members. Mr. Leonard Stokes added that the question was being considered by the By-laws Committee.

West Riding School Competitions.

At a meeting of the Council of the Leeds and Yorkshire Architectural Society held in Leeds on Thursday the question of architectural competitions for secondary schools in the West Riding was considered. The secretary was instructed to write to the West Riding County Council and also to the Governors of the Brighouse Secondary School pointing out that the plans selected in the recent competition for the Brighouse Secondary School did not comply with the conditions laid down, inasmuch as the accommodation provided was inadequate. With regard to the proposed Elland and District Secondary School it was resolved to point out to the County Council and the Governors of the school that the remuneration to be given to competing architects was inadequate, and to ask them to offer the usual terms.

Pearl Life Assurance Buildings, Leeds.

The directors of the Pearl Life Assurance Society, acting upon the advice of their consulting architect, Mr. Percy Monckton, F.R.I.B.A., F.S.I., have accepted the design of Mr. William Bakewell, F.R.I.B.A., of Park Square, Leeds, in the competition for their new premises in Leeds.

Footbridge over the River Wey, Guildford.

The result of this competition has been announced as follows:—First, Messrs. Clemence and Moon, architects, Guildford; second, Messrs. Davies and Swayne, civil engineers, Westminster. The design of Mr. W. E. Lloyd, surveyor, Guildford, was specially commended. 75 designs were received.

Elland Mixed Secondary School.

We have received copies of the conditions and amended conditions for the above. Clause 2 has now been amended to read as follows: "A fully qualified non-competing architect, in conjunction with the West Riding Education Committee's Inspector of Secondary Schools, will assist the governors in adjudicating upon the plans, whose decision, subject to confirmation by the West Riding Education Authority, is to be final." Clause 14 now reads: "The total amount which the governors are prepared to expend on the buildings as above described is £7,000, which includes all the items previously specified, including all professional charges." We have also received a copy of 60 supplementary questions and answers. Question 60 relates to clause 19 of the conditions. The architect employed will now receive 6 per cent. to cover the supply of quantities instead of the 5 per cent. originally stated.

Our Plate.

The Palazzo Nobile at Montipulciano stands in the Piazza Vittorio Emanuele, the chief square of the town, and was designed by Ant. da Sangallo the Elder. In the same square are situated the Cathedral, the 14th century Town Hall, and several large mansions. The open loggias at the corner on the ground and second floors overlook the square. The upper loggia is at present built up and has commonplace windows inserted. The Palace is built of a warm brown stone, and is roofed with the usual red furrow tiles. The drawing, by Leslie Wilkinson, is one of those which secured for the artist the Arthur Cates prize at the R.I.B.A. this year.

BRASS GATES FOR THE MAHARAJAH OF MYSORE.

The illustration on page 201 shows a view of a pair of massive brass gates, made entirely by British labour, in the Birmingham Works of Tonks, Ltd., and destined for the mausoleum of the late Maharajah of Mysore. The gates are 13ft 6in. high and 13ft. 6in. wide, across both gates, and weigh three tons. The frame is solid drawn and polished, and the casting is all brass, hand faced and lacquered, with dead finish and relieved. The design was based on a rough suggestion of the present Maharajah, and the appearance is practically the same on both sides, the répousé panels representing elephants in the jungle. The time occupied in making the gates was eight months. They will be erected between columns of white marble, and will not be subjected to the stress of weather, though the climate of Mysore is by no means terrible. This illustration of British brass-working will be welcome to those who imagine that the industry has died out here.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Local Authority's Rejection of Plans.

PROVINCIAL.—An Architect and Surveyor writes: "I enclose plan of a house [not reproduced], also copy of by-laws, with respect to both of which I should be thankful if you would answer the following questions:—(1) The council will not approve the plan unless the old wall is taken down and set back. Can they demand this? (2) Two resolutions that the council have recently passed are as follows: First, that no disapproved plan will be returned by post: the architect must call at the council offices for it. Secondly, that the council surveyor is not to give any particulars whatever of the reason for disapproving the plan. Can the architect demand to know reasons for rejection? (3) What is the remedy against arbitrary rejection?"

(1) The rural district council cannot compel you to set back the existing wall: they must accept matters as they find them, and confine their attention to the proposed new building. Are you sure that this is the only reason why your plans are disapproved? (2) The council are within their powers in passing the two resolutions you quote, though one may have one's own opinion as to their wisdom in doing so. (3) If you commence building before your plans are approved, you do it at your own risk, and are liable to be prosecuted and penalised in accordance with the by-laws (page 51, etc.), of which you send a copy. Proceedings are usually taken before the local bench of magistrates. Should you be aggrieved by the refusal of a sanitary authority to pass plans, your legal remedy is to obtain a *mandamus* from the High Court to compel them to show cause for the refusal. Whether such action is to be recommended depends upon circumstances, but it does not appear to me to be a question whether in this case it would not be better and cheaper to move the wall as required by the R.D.C.

F.S.I.

Workmen's Compensation.

ECCLES.—J. F. M. writes: "In addition to my own men, I have the workmen of my numerous sub-contractors insured against claims for compensation. This is unsatisfactory, as, in the event of an accident to one of the latter, the insurance company would probably require a return of the wages paid by all the sub-contractors to their workmen employed on my jobs. This, I can see, would be almost impossible. I purpose in future not to insure sub-contractors' workmen, but, before accepting the estimate of any sub-contractor, to require him to give me an indemnity against any claim that might be made by his men (in the event of an accident). I may say that one or two sub-contractors have voluntarily informed me that their workmen are insured. Should I be quite covered by adopting the above course, and if so in what form would you advise me to word the indemnity?"

The Workmen's Compensation Act, 1906, makes the principal contractor liable for accidents to a sub-contractor's workmen; but also provides (section 4, sub-section 2), that the principal may arrange for an indemnity to be given to him by the sub-contractor. I advise you, therefore: (1) To employ no sub-contractor who is not in a sufficiently sound financial position to protect you against any claims by his workmen; (2) To insert an indemnity clause in every sub-contract protecting you against any claim by that sub-contractor's men, whether arising under the Workmen's Compensation Acts, or at Common Law. F.S.I.

Right of Light.

Bloxwich.—B. C. writes: "My intention is to build two cottages, as shown on the accompanying rough plan [not reproduced]. Please say whether there would be any danger of infringing rights of light."

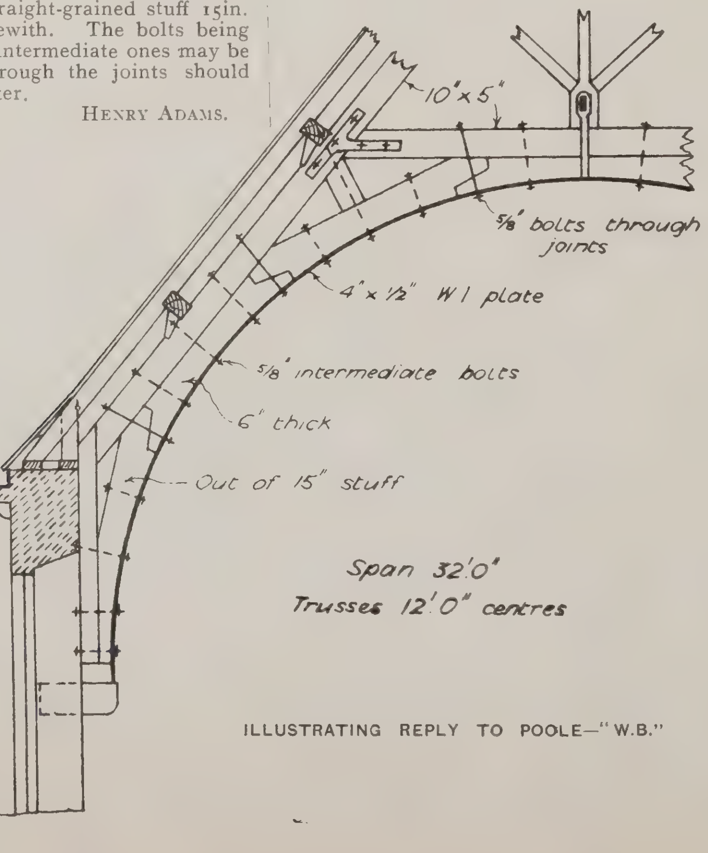
You would undoubtedly run a grave risk in building the cottages in the manner proposed, as you would certainly take away a great deal of light from your neighbour's cottage windows, and so render yourself liable to be restrained by an injunction, and possibly have damages and costs to pay, and perhaps be ordered to demolish the new cottages. Cannot you set your new houses back sufficiently far to clear the ancient lights in the neighbouring property? F.S.I.

Width of Timber for Curved Braces.

Poole.—W. B. writes: "Please say how the rib is found in the roof shown in Fig. 1, p. 78, of your issue for January 27th."

The timber for the curved braces to collar-beam truss shown at p. 78 would be compass oak, or steamed and bent fir, not less than 16in. wide. An alternative method to permit of cutting out of straight-grained stuff 15in. wide is shown herewith. The bolts being closer together, the intermediate ones may be ⅝in., but those through the joints should remain ¾in. diameter.

Henry Adams.



ILLUSTRATING REPLY TO POOLE—"W.B."

Design for Braced Collar-beam Roof.

Lytham.—J. W. T. writes: "Will Mr. Henry Adams kindly explain (*re* reply to 'Dublin—L.,' design for braced collar beam roof, in issue for January 27th) where he gets the 30 in calculating neutral axis from bottom of plate:—

$$\frac{(52{\cdot}5\times15{\cdot}5)+(52{\cdot}5\times5{\cdot}5)+(30\times1{\cdot}625\times{\cdot}25)}{52{\cdot}5+52{\cdot}5+(30\times1{\cdot}625)}$$

Also, why he deducts this distance, viz., 7·3 from the depth of beam and plate, and × the remainder by 2. Also what is the limit of safety to allow in cwts in compression and tension in principal rafters, etc., as calculated by the formula $\frac{W}{A}\pm\frac{M.}{Z}$

In calculating the distance of neutral axis from bottom of plate, the area of wrought iron plate is multiplied by 30, to give the relative value in timber. The timber alone on one side of the neutral axis, and the timber and wrought iron on the other side then have the same value with reference to the neutral axis. Therefore, in order to get a scantling of timber only with the same strength, the distance from neutral axis to upper edge of timber must be doubled. The doubled dimension being taken as depth of beam, the extreme fibre stress is obtained by the ordinary formula $\frac{W}{A}+\frac{M}{Z}$. Timber varies so extremely in strength that it is difficult to lay down general rules, but a stress of 10 cwt. per square inch gives a factor of safety of 3 on the weakest fir timber, and 12 on the strongest, both for tension and compression. Under ordinary conditions of use, the maximum working stresses on timber in roof trusses may be taken as 6 cwt. compression and 3 cwt. tension per square inch, but double this may be allowable with best workmanship and material. The allowance for tension is only given as half that for compression, owing to the general failure to connect timber in such a way as to call forth its full power.

Henry Adams.

Cause of Floor Decaying.

Scotland.—Rutherglen writes: "In December, 1907, I built a house. It was deafened in the manner usual here—viz., a coat of lime on the boards, and afterwards, before the flooring was laid, a coat of asbestos was laid on top, leaving a space below the floor of at least 2½ins. The house was occupied in May, and the tenant now complains that where he has laid floorcloth the floor is destroyed by damp, and, in fact, the underside was wet. Where carpet was laid on the floor, however, there is no sign of damp. Can you indicate the cause of this?"

The fault in this case lies with the use of an impervious floorcloth upon a wooden floor. Being absolutely impervious to air, it confines any moisture there may be under such circumstances, and a very slight amount will rot woodwork. F.S.I.

Fall Required in Pipe.

Padiham.—W. H. writes: "Please state the fall required for a 12-in. stoneware pipe to supply 1,000 gallons per minute; also size of a draw-well to avoid friction. Is ——'s cement considered good?"

The head in feet required to deliver 1,000 gallons per minute in a stoneware pipe, 12in. diameter and 100 yards long, will be found as follows:—Head to produce velocity $\frac{G^2}{215d^4}=\frac{1000^2}{215\times12^4}=0.224$ ft. Head to overcome friction $=\frac{G^2L}{240d^5}=\frac{1000^2\times100}{240\times12^5}=1{\cdot}675$ ft. or together $0.224+1.675=1.899$, say 2ft. fall required in the pipe. If the pipe be increased to 15in. diameter, the necessary fall will be reduced to 0.64ft., say, 8in.; and if the pipe be reduced to 9in. diameter, the fall must be increased to 7.76ft., say, 7ft. 9in. The entrance to the pipes should be bell-mouthed. The writer does not understand what is meant by "size of draw-well to avoid friction," nor can he give any opinion on any particular brand of cement.

Henry Adams.

Pressure in Water Main.

Chatteris.—S. H. writes: "Supposing water is delivered in bulk at point A, and the agreement is that at that place the pressure to be given is equal to 50ft.-head, or about 22lbs. per sq. inch. The main up to A is 8-inch, and from that point 7-inch for several miles. What amount of pressure do you suppose would be lost by friction, etc., on a length of 7-in. main, 4 miles long, that is, what less pressure in lbs., also in feet-head, should we get at a point 4 miles from A on 7in. main? The ground is all fairly level."

The question omits to state what quantity of water is required to pass through the 7-in. main in a given time. When no water is passing, no head would be lost by friction, and the full pressure of 50ft.-head at A would be obtained at B, except for the difference in level of the two points, which would add 11.4—8.3 = 3.1ft.-head to the 50ft. Assume the water to be flowing at 3ft. per second, this will be equal to $\frac{72\times60}{10}=$ 294 gallons per minute. Then the head, to produce velocity, will be $\frac{G^2}{215d^4}=\frac{294^2}{215\times7^4}=$ 0.167ft., and the head to overcome friction will be $\frac{G^2L\text{ yds.}}{240d^5}=\frac{294^2\times4\times1760}{240\times75}=150{\cdot}857$ ft., or a total head of $0.167+150.857=151.024$ft., but there is only 53.1ft.; therefore the possible discharge is $294\times\sqrt{\frac{53.1}{151.024}}$ whence

$$\log h=\log 294+\frac{\log 53.1-\log 151.024}{2}=$$

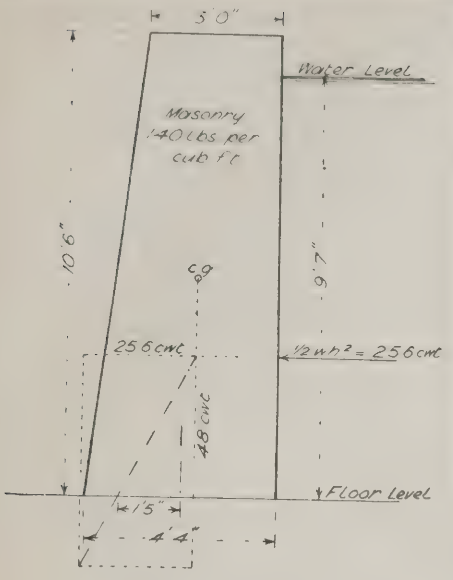
$$2.4683473+\frac{1.7250945-2.1790356}{2}=$$

$2.4683473+\bar{1}.7730294=2.2414$, for which the antilogarithm gives 174.35, say 175 gallons per minute.

Henry Adams.

Reservoir Wall.

Midlands.—W. L. writes: "Please explain how the calculation for the section of reservoir wall shown in the accompanying sketch should be ascertained."



ILLUSTRATING FIRST REPLY TO MIDLANDS.—"W.L."

The stone of which the wall is built is not named, so that the weight cannot be estimated. It may, however, be assumed to be 140lbs. per cubic foot. Upon that assumption the line of thrust will be as shown in section herewith, and the maximum stresses at base of wall will be $\frac{W}{A} \pm \frac{M}{Z} = \frac{48}{4\frac{1}{3}} \pm \frac{48 \times 1\frac{5}{12}}{\frac{1}{6}(1 \times 4\frac{1}{3}^2)}$ $= 11 \pm 22 = 33$ cwt. or 1.65 tons per sq. ft. compression, and 11 cwt. or 0.55 ton per sq. ft. tension, which ought to be quite safe even for lime mortar. Care will have to be taken with the cement rendering to ensure good adhesion without cracking.

Henry Adams.

Reservoir Wall.

Midlands.—W. L. writes: "Further sections of the reservoir wall referred to in a former communication are sent herewith. Please advise as to its strength."

The correspondent's second letter in reference to this case shows that the conditions are greatly different from the simple inquiry he first made, which has already been answered, as the thrusts from the arched roof and earth filling have to be taken into account. In order to work out the stability of the wall, the primary thrusts from the arch and load above must first be found by parallelogram of forces as shown in the accompanying illustration. Continue the thrust at skewback with the weight of wall and earth above it, and then combine the resultant so found with the thrust from the earth filling. This second resultant is then combined with the water pressure, giving the final resultant, which cuts the ground at 3.16ft. from the centre of base of wall. The stresses will then be $\frac{W}{A} \pm \frac{M}{Z} = \frac{74}{4\frac{1}{3}} \pm \frac{74 \times 3.16}{\frac{1}{6}(1 \times 4\frac{1}{3}^2)} =$ $17 \pm 75 = 92$ cwt. or 4.6 tons per sq. ft. compression, and 58 cwt. or 2.9 tons per sq. ft. tension, so that the wall would probably fail, unless the tie-bolts, of which insufficient particulars are given, are sufficient to secure stability.

Henry Adams.

Reservoir Wall.

Midlands.—W. L. writes: "With reference to my second inquiry on this subject, will you kindly state whose formulæ were adopted in the reply?"

I have adopted my own formulæ, and methods based upon Rankine. It is clearly shown on the diagram that the opposing weight of the soil has been taken into account. In the formula $\frac{W}{A} \pm \frac{M}{Z}$, W = vertical component of resultant in cwts., A = area of base for 1ft. run in square feet, M = bending moment due to eccentricity of resultant in cwt.—feet, Z = section modulus $= \frac{1}{6}\ b\ d^2$, where b is 1ft. run and d is width of base in feet. The sign $\pm$ means that there are two answers obtainable, using the plus gives the compression in cwts. per sq. ft. on outer edge, and using the minus gives the compression, or tension, as case may be, on the inner edge.

Henry Adams.

Building Contracts.

Woburn.—X. M. writes: "General information with respect to building contracts would be serviceable. Is the value of the stamp governed by the amount of the contract?"

A building contract may be a very simply worded document, so long as it clearly shows what is intended, but it is nevertheless to be recommended that use should be made of one of the usually recognised forms of contract; the oldest is that issued by the Institute of Builders, and another, which probably is that most generally employed, is issued by the Royal Institute of British Architects. To ensure enforcement in the courts a contract to build should be in writing, but part performance may be accepted by a court as securing its enforcement. A contract should be signed by the party against whom it is intended to be enforced (i.e., the contractor), but it is desirable that it should be signed by both parties. A sixpenny agreement stamp (adhesive or impressed) is sufficient for any building contract: no "ad valorem" duty is chargeable.

F.S.I.

Procedure for Church Committee.

Waterford.—W. S. B. writes: "A small church is to be erected to seat from 200 to 300. The site has been secured, on which at present stand two dwelling houses (these become the property of the purchasers of site). The sum at disposal for building is estimated at about £2,000. (a) What would be the best course of procedure relative to procuring plans, etc.? (b) What should be a fair average cost per sitting? (c) If competitive plans are obtained, what is the proper course in regard to architect's fees? (d) What information is it necessary to lay before an architect in asking for plans?"

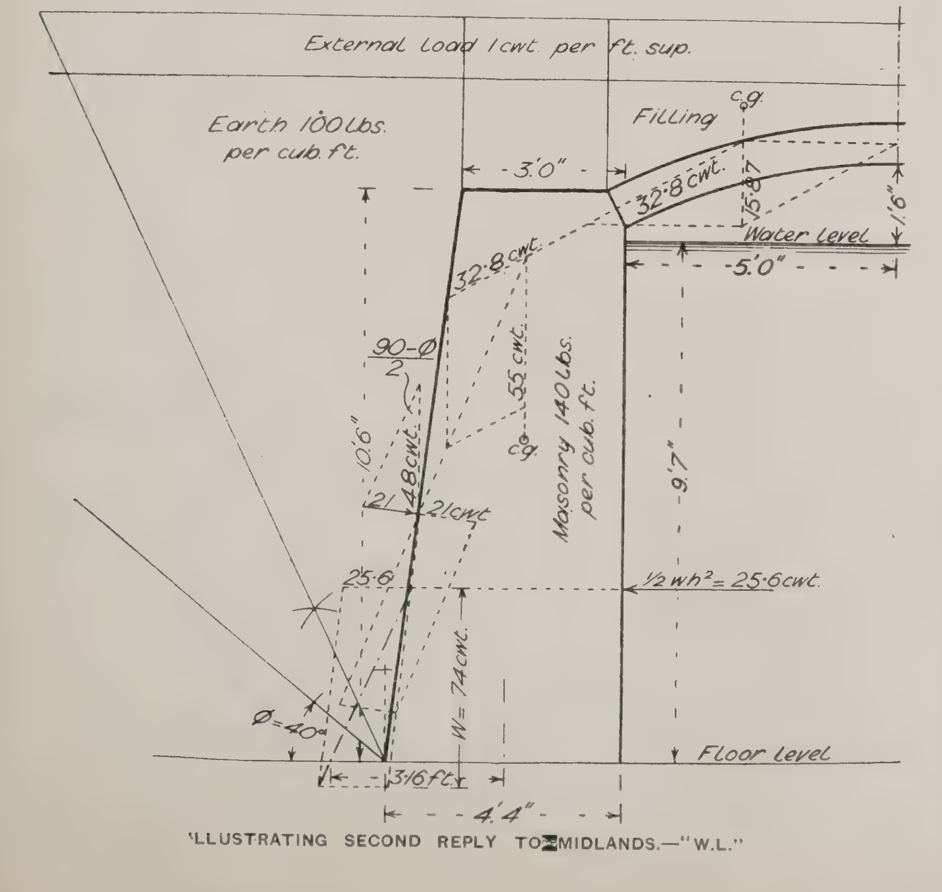
(a) The vicar, wardens, sidesmen, and any prominent church workers, should form themselves into a committee, termed "Building Committee," and should discuss and settle whether or not they will have a competition, or employ an architect. If they decide upon a competition, they should write to the Royal Institute of British Architects for advice, and ask them to nominate an assessor to draw up conditions, etc., and generally to advise. (b) Allowing for the sum of £2,000 (named as the limit at disposal), a single architect should, I think, be selected, as a competition would be expensive. The average per sitting is usually taken at £10. Very simple work, if labour is cheap, might be got for £9. These prices are inclusive. (c) The R.I.B.A. will send data for competitions, and should appoint an assessor, who will advise fully upon all matters. Address to Secretary, 9, Conduit Street, Regent Street, W. (d) If the committee select an architect, it will be necessary for them to meet him, when they can explain all particulars as to (1) site; (2) fees; (3) sum to be expended on the building and site, and accommodation they would like to obtain for each sum; (4) style they advocate; finally leaving him to advise on these matters and to give them the best solution he can devise.

Architect.

Points in Fire Insurance.

Cambridge.—Batnac writes: "I should be glad to know the usual custom as to fire insurance, and the best way to put an owner in a good position in the event of fire. For instance, in the following cases what should the amount be? (1) Substantially built brick and slate or tile farm premises, just completed at a cost of £900. (2) Do. do. pair of cottages at £450. (3) As 1 and 2, but built say, 20 years ago, when building was much cheaper. (4) Farm premises built with stud and weather boards on a brick dwarf wall, roofed with corrugated iron, costing £300. Presumably a good part of the walling would not be seriously damaged by a fire. Again, if one insured No. 3 for more than they cost, would one recover from an insurance company enough to reinstate at present prices? What about really old premises which serve their purpose but could not be reinstated for anything like what they appear to be worth at the moment?"

(1) The rate is 3s. per cent. on the total cost of the building. (2) The rate is 1s. 6d. per cent. on the total cost of the cottages. (3) The same rates as 1 and 2. (4) The rate is 3s. per cent. on the present estimated value. It is not possible to insure a building for more than the actual value of such building. It is always necessary to insure



ILLUSTRATING SECOND REPLY TO MIDLANDS.—"W.L."

a building for its full value at the time the insurance is taken out, otherwise, should a fire occur, a proportionate amount of the damage done can only be recovered from the insurance company.
R.T.

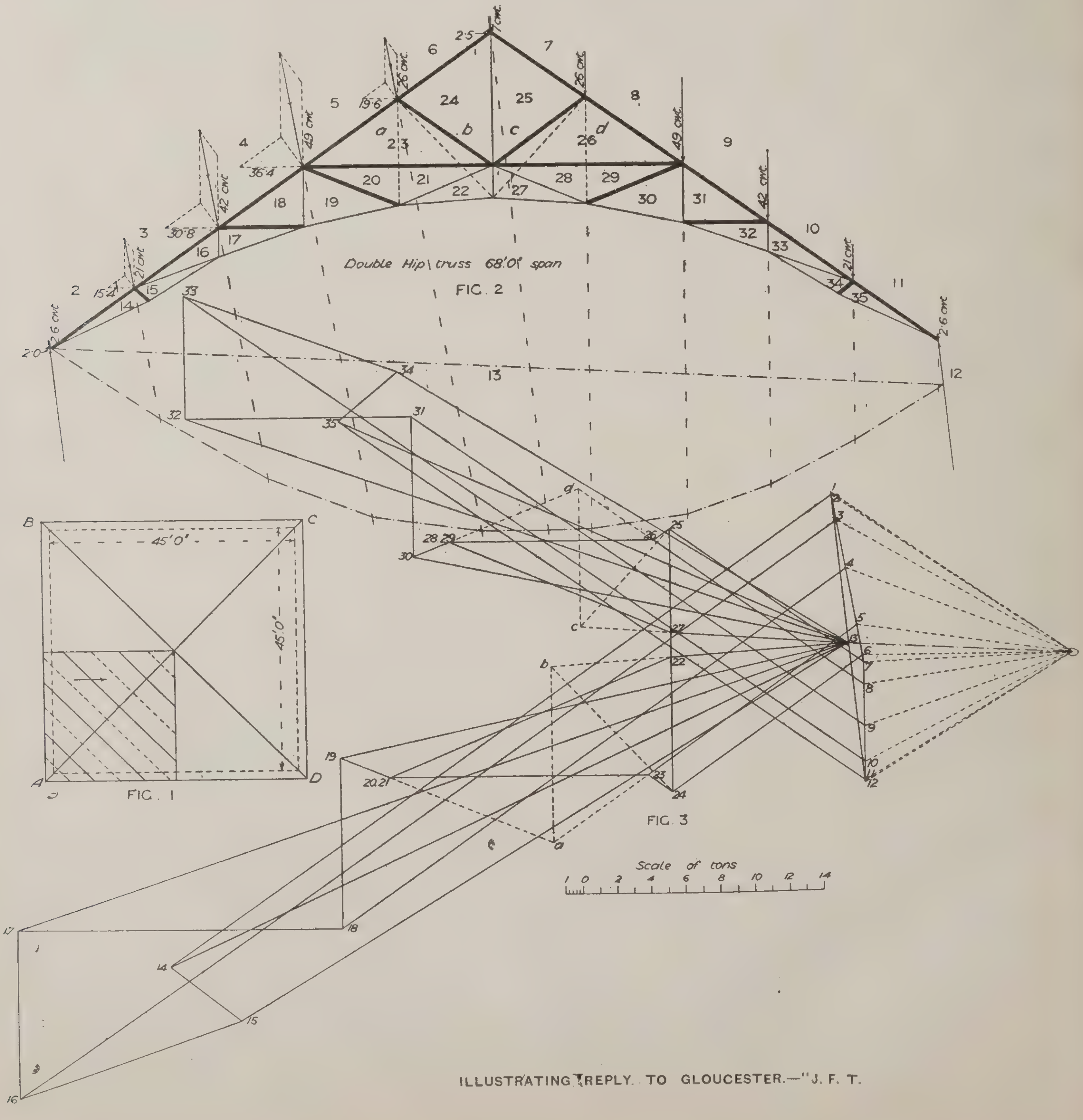
Diagonal Truss to Square Roof.

Gloucester.—J. F. T. writes: "The accompanying diagram is of a roof truss for span of about 64ft., being the diagonal truss to a square of 45ft. The main scantlings are marked upon it. I should be glad to know whether they are of sufficient strength for a slate roof of 45 degrees pitch?"

The first step will be to find the loads upon the truss. In Fig. 1, ABCD shows plan of roof with four diagonal half-trusses, the load supported by one half truss is shown by the portion over which the purlins are drawn. The full lines represent the purlins, and the dotted lines the space on each side carried by the purlins. The allowance for structural load is 28lbs. per ft. super., and for horizontal wind pressure 42lbs. per ft. super. The wind is taken as coming on the side where the arrow is shown, from which the area under pressure is taken, but the direction is assumed to be in line with the diagonal, as otherwise a very awkward problem is introduced. Two opposite half trusses must be taken together as the loading is not symmetrical. The load on each purlin from the wind being found in the horizontal direction, the triangles of pressure to give the normal in each is shown upon Fig 2. This normal is then combined with the structural load and the resultants used to form the line of loads in Fig. 3. The frame diagram Fig. 2 is numbered throughout, and the stress diagram constructed up to point 19. A difficulty is then found and substituted members *a b*, *b* 24, 25 *c*, and *c d*, are inserted as shown by dotted lines. The stress diagram will then be found to close up properly. Now having obtained points 24 and 25, we draw in the stress diagram lines 24—23 and 5—23 to get point 23; then 23 to 20—21 and 19 to 20—21 to get point 20—21. Then 20—21 to 22 and 13 to 22 to give point 22. Similarly, on the other side, points 26 to 29 may be found. The nature of the stresses may then be indicated by thickening those members that are in compression, but it should be observed that unless there is some special reason for the complication shown, a much better truss would be obtained by using the substituted members as real members and doing away with the others. Taking the principal rafter of the size suggested, viz., two 5in. by 3in. by ½in. angles, having a sectional area of 7·5 square inches and unsupported length of 8ft., the calculation will be $W = \dfrac{FS}{1+\frac{1}{a}\left(\frac{l}{d}\right)^2}$

$$= \frac{6{\cdot}5 \times 7{\cdot}5}{1+\frac{1}{750}\left(\frac{96}{5}\right)^2}$$ = say 33 tons, while the maximum stress is 58.3 tons. It is therefore evident that a stronger section is required. Try two 7in. by 4in. by ½in. angles, then $W = \dfrac{6{\cdot}5 \times 10{\cdot}5}{1+\frac{1}{750}\left(\frac{96}{7{\cdot}2}\right)^2} = 55{\cdot}04$ tons safe stress against 58.3 tons actual stress, so that this section may be adopted. For the main tie the maximum stress is 51 tons. Allowing 6½ tons per square inch net area $\frac{51}{6\frac{1}{2}}$ = say 8 square inches are required, and deducting for rivet holes, say, two 7in. by 4in. by ½in. angles, as for the principal rafter. The stresses in the remaining members may be scaled off Fig. 3.

Henry Adams.



ILLUSTRATING REPLY TO GLOUCESTER.—"J. F. T.

CONTRACTORS' SECTION.

(MONTHLY.)

"APPLICATIONS" UNDER THE LONDON BUILDING ACT.—II.*

By B. Wyand.

Width of Roadway.

The erection of buildings within the prescribed distance from the centre of the roadway can only be carried out under a consent from the Council in cases where any portion of the site which is proposed to be built on has not been at a certain time previously occupied by a building or structure. This question is governed by section 13 of the Act of 1894 and sections 3 and 4 of the Act of 1898. A give-and-take policy is here of great assistance in clearing up difficulties. Often a portion of the site was previously occupied by a building, and may be built on if the necessary plans are certified as correct by the district surveyor. Thus, if the erection of a building on a new site within the prescribed distance were absolutely prohibited, an irregular frontage would result. But both parties may be satisfied, the owner agreeing to give up a certain amount of land to the public way and the Council allowing him to build up to the edge of the surrendered land on the whole of the frontage. The exact amount of land to be given up will be a matter of arrangement; the architect acting for the owner must make application showing what land he proposes to surrender, and his application will be then considered on this basis. If the offer is not thought to be reasonable, consent may be refused, but it will be of course open for him to make a further application showing a larger area of land to be given up. Land hunger and its economical gratification are very much to the front at Spring Gardens.

It must not be forgotten, however, that the sections preclude the erection not only of a building but also of the fence or boundary of the forecourt if within the prescribed distance, unless consent is first obtained. In a case of this nature it is open for an application to be made for the giving up of land to the public way, and the setting back of the forecourt wall. Or instead, consent to the erection of the wall at the extreme boundary of the site may be asked for, and it is possible under certain circumstances that such consent may be given if it is agreed on by the owner to remove the wall when called upon to do so. Possibly, as in the case of buildings of a public or shop character, there may be no need for a forecourt wall; but in the majority of cases, especially where the house is occupied as a residence, a forecourt wall is almost essential.

Reference has been made to the fact that buildings on previously built-on sites may be erected within the prescribed distance if certified plans are obtained; but dwelling-houses to be inhabited or adapted to be inhabited by persons of the working class are an exception. Unless the consent of the Council is obtained, no such dwelling-houses may be erected within the prescribed distance in the City, and within 20 ft. of the centre of the roadway in the rest of London, so as to exceed the distance of its front wall from the opposite side of the street. So here is another case in which an application under section 13 of the Act of 1894 may be necessary. Section 4 of the Act of 1898 should also be quoted in the application, as in this section the words "20 ft. from the centre of the roadway" are stated, except in the City, to be substituted for the prescribed distance mentioned in section 13—no small consideration when one is erecting a working-class dwelling to abut on a footway.

General Line of Buildings.

Of equal importance with section 13 of the Act of 1894 is section 22 of the same Act, which prohibits the erection without the consent of the Council of buildings in advance of the general line of buildings, except on a site lawfully occupied by a building or structure at the commencement of the Act, or at any time within seven years previously. These provisions do not, however, apply in the City of London, which is exempted from the operation of the whole of Part III. of the Act of 1894, in which part section 22 is contained. The whole question turns on what is the general line of buildings in the particular street in which it is proposed to build. The general line has been defined in relatively few streets, but it will be well at the outset, in any case, to ascertain at Spring Gardens whether any such general line has been defined. If the answer to such enquiries is in the negative, as will be probably the case, then until such a time as the general line is defined by the superintending architect, against whose decision there is an appeal to the Tribunal of Appeal, the line is entirely a matter of hypothesis. If in the opinion of the architect of the proposed building the provisions of the Act relative to the general line will not be contravened by the erection of the building, he may decide to go ahead and risk being pulled up by the authorities. If he has a strong case, this may be the soundest course for him to adopt. But to take the bull by the horns in such a manner may not be to the liking of the majority of persons. Thus a more usual course may be to make the application for consent, and, where it will appear that the case is not a strong one, no doubt an application is the best course to adopt. The circumstances will have great influence on the result.

If in the opinion of the Council's officials there is uncertainty or doubt as to there being a contravention of the Act, consent will no doubt be graciously given. If, on the other hand, it is considered that the building will project beyond the general line, consent may be refused, or, if it is granted, may be subject to conditions. Section 26 of the Act of 1894 specifically states that the Council may attach any conditions to a consent, more particularly that the land in front of the building may to such an extent as is thought proper by the Council be dedicated to the public, or that the building may be used only for such purposes as specified in the consent. In some cases a portion of the site may have been occupied by a building, and may be built though in advance of the general line of buildings. Here occurs an opportunity for negotiation with the powers that be, which, if taken advantage of, may greatly assist the interests of the building owner. Section 27 of the Act should be noted, for this states that no consent of the Council shall alter the general line as existing previous to that consent. The whole question being based upon, in the vast majority of cases, a hypothetical general line, the advantages to be obtained by tact, together with sound experience, are by no means inconsiderable.

Height and Air Space.

The provisions of the Act of 1894 with respect to height of buildings and air space may in certain respects be departed from with the consent of the Council. Where a building is situated at the corner of two streets, it is open to the Council, despite the ordinary provisions of section 41, to allow the erection of buildings not exceeding 30 ft. in height upon such part of the space at rear as they may thereto fit, provided that they do not interfere unduly with the access of light and air to adjoining buildings. Also any part of a domestic building may extend beyond the diagonal line at the rear, provided the Council, or upon appeal, the Tribunal of Appeal, may be satisfied that an open cubic space of air will be provided equivalent to the open space which would have been provided if the ordinary provisions of section 41 had been complied with. Applications in these cases require to be accompanied by drawings prepared in a somewhat more elaborate and comprehensive manner than was necessary under the sections previously mentioned. A good knowledge of section 41 of the Act of 1894 is necessary to enable an architect to obtain the best results with regard to the rear portion of his building.

Applications under sections 42 and 44 of the same Act with reference respectively to the erection of working-class dwellings not abutting on a street, and in the laying out of a cleared area, also require fully explanatory drawings. The desirability of preparing in the first instance a good set of drawings showing off the proposed scheme to the best advantage is accentuated by the fact that under both sections applicants dissatisfied with the Council's decision may appeal to the Tribunal of Appeal, a remedy which, if a reasonable scheme has been brought forward, will be likely to be made use of, when full drawings will be essential.

Section 43 of the Act, which deals with the

Re-erecting of Domestic Buildings,

is contradictory. The first subsection states that if a certificate is obtained from the district surveyor as to the correctness of the plans of the old building, the new building may be erected so that no more land may be occupied by it than was occupied by the previous building, thus presumably allowing the plan to be varied subject to no larger area of land being built on. The second subsection, however, distinctly states that if the person erecting the domestic building desires to deviate in any respect from the plan or plans certified by the district surveyor, he must apply to the Council. This latter subsection has been strengthened by a case decided in the courts. Mr. Bernard Dicksee, in his book on the London Building Act, states that the first subsection was altered to its present form in Committee of the House of Lords, but the second subsection was not altered—thus the apparent contradiction.

Height of Buildings.

The provisions of the Act of 1894 controlling the height of buildings may also be departed from if consent is first obtained. This remark applies both to section 47, which limits the height of buildings to 80 ft., measured to the top of the parapet, or to the top of the external wall if there is no parapet, and to section 49. This latter is to the effect that in streets less than 50 ft. in width, and laid out after 1862, no new building may be erected or existing building raised so as to exceed in height the distance of the front wall from the opposite side of the street. It is possible that circumstances may occasionally occur which may render an application under this latter section a subject for hope. As regards the former section, it is not often that a client will desire to exceed the limit of 80 ft., and unless the proposed building is on an exceptionally big scale it is very doubtful whether the limitations of height would be waived to any appreciable extent.

Recesses and Openings.

Not a few of the constructional requirements of Part VI. of the Act of 1894 may be departed from by consent. Among these are the provisions of section 54 with regard to recesses and openings in external walls, and recesses in party walls. It is noteworthy in this instance that it is the superintending architect who, in accordance with any rules made by the Council, may consent to any modifications or relaxations of the requirements. Then, again, it is possible to obtain exemption from the rules as to timber in external walls, and as to the rules for the construction of furnace chimney shafts laid out in such full detail in section 65. It may not often be thought desirable to depart to any great extent from the requirements with regard to construction, but variation is possible, and this is a privilege which it is well not to lose sight of.

---

*For the first part, see page 3 of the issue for January 6th.

"Projections"

next demand attention, and it is important to note that in the preface to section 73, the words "except with the consent of the Council" are contained. Thus it is possible to obtain exemption from any one of the numerous requirements contained in this section; or if total exemption may not be reasonably expected, possibly the authorities may still allow some little relaxation in matters of detail. To enumerate at length all the detailed requirements of this section would be sufficient in itself for a lengthy article. Sufficient be it to summarise the section as referring to (1) general projections, (2) balconies and cornices, (3) shop fronts, (4) bay windows, (5) oriel windows. There will no doubt often arise occasions in the practice of nearly every London architect when it will be necessary for him to make an application under this section. A careful perusal of the wording of the various requirements will be desirable in order carefully to note the whole of the points which require to be applied for, and also it will be well to see whether in some instances the proposed building or structure is well within the limits of the section, as these may be utilised as the basis of a plea for exemption in other respects.

Under the provisions of the recently passed L.C.C. (General Powers) Act, 1908, sections 75, 76, and 77 of the Building Act of 1894 are repealed. The new Act gives the Council power to consent to additional cubical extent without limitation, and also to consent to openings of any size in division walls, and to allow other than iron doors to be provided to such openings. The Act, in short, gives the Council unlimited power in respect of the cubical extent of all buildings used for trade or manufacture, and there is no right of appeal against any decision of the Council. Buildings for the supply of electricity may, with the consent of the Council under section 203 of the Act of 1894, be exempted from any of the provisions of the Act. In all cases in which the question of cubical extent is involved, the plans accompanying an application require to be liberally supplied with sections, and the heights carefully figured.

"Special and Temporary Buildings and Wooden Structures"

is the heading to Part VII. of the Act of 1894, and with the exception of buildings specially exempted, no building or structure which comes within the scope of this part of the Act can be erected except by consent. Special buildings or structures can only be erected under a consent from the County Council under section 82; and to come within the scope of this section they must be "buildings or structures to which the general provision of Part VI. are inapplicable, or in the opinion of the Council inappropriate having regard to the special purpose for which the building or structure is designed and actually used." The exact scope of these phrases appears to be difficult to determine. Buildings and structures of an engineering character are not infrequently erected under this section, and the Council in such cases usually require very full details of the construction, and demand to be fully satisfied as to stability before they issue their approval. Section 84 is now administered by the Metropolitan Borough Council, while licensing powers under section 83 are still retained by the County Council.

There is no definition of "wooden structure," and the course to be adopted with regard to wooden sheds is often a doubtful question, for the Borough Councils are now the licensing body under section 84 with regard to wooden structures, while the County Council can under section 83 license "an iron or other building or structure of a temporary character." Each case must be taken upon its merits—possibly even an application unsuccessful in one direction may be more fortunate in another. The period for which licence may be expected to be obtained is not more than three years, and at the expiration of this period it is probable that a renewal may be obtained if a certificate of structural stability is obtained from the district surveyor. All applications under this part must be accompanied by a fee of 5s.

A Dispiriting Job.

One of the most dispiriting jobs I ever had was in connection with a "special" building which I wished to erect for a client at Hackney. My client was a manufacturer of rubber goods, and the petroleum inspector had requested him to provide a detached building for the carrying out of a certain definite process, the work in connection with which necessitated the use of highly inflammable material. The building I designed was 12 ft. by 6 ft.—a mere shed was all that was required—framed in angle and tee iron, and covered with corrugated sheets—fireproof, in fact, throughout. No wood entered into its composition, and I anticipated no trouble from the County Council, especially having regard to the fact that I was backed by their own inspector. I submitted complete plans as required under the Act, together with the fee of 5s.; and then the trouble began. Special plans were called for with ½in. scale details. I was requested to call at Spring Gardens and explain, to call again and interview the architect; in fact, as much fuss was made as though I were going to erect a Ritz Hotel. I remember one official claiming exception to the ⅜in. bolts. "We can't concern ourselves with eighths of an inch here," he said, magniloquently, and scored my carefully prepared detail drawing with blue pencil in half a dozen places. To object to his proceeding would have meant certain rejection of the plans, so I had to grin and bear it. One objection raised was that I had not submitted a proper block plan, certain adjoining buildings not being shown: and I could not convince this official that these buildings having been burned down and the charred ruins alone remaining they hardly required delineation upon the plan. I had, in the end, to submit another plan! To cut the matter short, I offered at last, in despair, to "place the structure on a cart and bring it down to Spring Gardens for inspection," and I think this must have brought their folly home to them, for some two months later my plans were approved. My fees came to nearly as much as the cost of the structure.

Dwelling-Houses on Low-lying Land.

Before any person may erect or adapt a building to be used wholly or in part as a dwelling-house on land the surface of which is below the level of Trinity high-water mark, and which is so situate as not to admit of being drained by gravitation into an existing sewer of the Council, he must make application for a licence. Such an application must, as has been previously stated, be addressed to the Clerk of the Council. The chief engineer of the Council shall give his decision upon such application, and the Council will act upon his decision and inform the applicant whether or not a licence will be granted. Trinity high-water mark is roughly 12 ft. 6 ins. above Ordnance datum. In dealing with the subject of consents, mention must be made of section 207 of the Act of 1894, which states that it shall not be lawful *unless with the consent of the Council*, to alter a building so as to make it not in conformity with the provisions of the Act applicable to new buildings. Hence applications may be made under this section.

Modifications and Relaxations.

Such are the sections of the London Building Acts of 1894 and 1898 and the L.C.C. General Powers Act, 1908, having reference to the formation of streets and the erection of buildings under which the Council have power to admit of modifications and relaxations. Before submitting an application, the leaflet issued by the Council which has already been referred to, should be studied, and the drawings prepared in accordance with the colour scheme and of the scales required. The leaflet is in some respects, however, out of date. It contains particulars of the form of application to be made under the repealed sections having reference to cubical extent, and under section 63 of the Act of 1894 for means of escape from the top floors of buildings over 60 ft. in height. This latter section is repealed by the Amendment Act of 1905.

Means of Escape in Case of Fire.

This Act now demands consideration. It is no doubt common knowledge that its operation is wholly restricted to requirements relating to means of escape in case of fire. No regulations appear to exist for the submission of plans other than those contained in the Act. Applications for exemption seem to be possible under but two sections, section 10, which concerns the reconstruction of the roofs of certain projecting shops, and section 12, under which dormers, trap-doors, or other means of access to roofs, may be required in certain existing buildings, and all new buildings having more than two storeys above the ground storey or exceeding 30 ft. in height. In both sections it is stated that the Council, or, in the event of an appeal, the Tribunal of Appeal, may sanction the exemption of a building from any or all the provisions of the section. There is nothing to indicate that plans are required to accompany an application for exemption under these sections. Presumably a letter of application is all that is legally necessary. The submission of plans will, however, often be desirable, particularly under section 10, for exemption in such a case may depend upon the character of the means of escape from the house at the back of the projecting shop, and favourable points might be lost if not clearly indicated upon the plan.

Compulsory submission of plans, rather than the optional submission of applications for relaxation, is required by the other principal sections of this Act. Although rather outside the scope of this article, the subject may be lightly touched upon, inasmuch as common ground occurs in connection with the preparation and submission of plans. Section 7 requires that before a new building is erected except a dwelling-house occupied by not more than one family, which is a high building, i.e., has a floor at a greater height than 50 ft. above the footway, or which is to sleep or to be occupied by more than 20 persons, it shall be provided, in accordance with plans approved by the Council, with such means of escape in case of fire as can be reasonably required under the circumstances of the case. It is distinctly stated in the section that the plans may be sun-prints or reproductions. Other cases in which plans showing means of escape must be submitted are those of buildings coming within the operation of the Factory and Workshop Acts, and those of theatres and other places of public resort which come within the scope of the by-laws made under the Metropolis Management Amendment Act, 1878.

Before making an application or determining any point whatever under the Building Acts a copy of the Acts should be obtained. The man who has the strongest grip of the subject will none the less be the last to trust to memory.

FAIR WAGES CLAUSE IN GOVERNMENT CONTRACTS.

To-night (Wednesday) Mr. Hodge, M.P., intends to propose in the House of Commons the following resolution:—

"To call attention to the Fair Wages Clause in Government contracts and its administration; and to move, That, in the opinion of this House, the Fair Wages Clause in Government contracts should be so amended as to provide that the contractor shall, under penalty, pay to all the workmen in his employ not less than the minimum standard rate of wages recognised by trade societies in the district where such men are employed, and shall observe the recognised hours and proper conditions of labour; and if there shall be no such standard rate of wages or recognised hours and proper conditions of labour in that district, the contractor shall pay to such workmen not less than the minimum standard rate of wages recognised by trade societies customarily executing such class of work in the nearest district, and observe the recognised hours and proper conditions of labour prevailing in respect of the particular trade in the nearest district in which such men are employed; also that the contractor shall be prohibited from sub-letting any portion of his contract, except where the department concerned specially allows the sub-letting of such special portions of the work as could not be produced or carried out by the contractor in the ordinary course of his business; and any such sub-contractor shall be subject to the same conditions as the contractor."

The matter is of importance to builders, because if the resolution is accepted by the House its effect will be largely to override the main conclusion of a report recently rendered by a Treasury Committee appointed to consider the working of the Fair Wages resolution of the House of Commons of February 13, 1891, as embodied in Government contracts.

The main conclusion of the committee was:—

"We recommend that the present wording of the Fair Wages Clause, which obliges the contractor to pay the current rates of wages for competent workmen in the district where the work is carried out, should be retained.

"While we do not recommend that words intended to enforce the observance of 'Trade Union conditions' should be inserted in Government contracts, we think that such conditions of employment as are generally accepted in the district in the trade concerned must be taken into account when considering the question whether a particular contractor is observing the Fair Wages Clause."

The present wording referred to is shown by the following extract from the War Office conditions of contract:—

"No portion of this contract shall be transferred without the written permission of the Secretary of State for War. Sub-letting, other than that which may be customary in the trades concerned, is prohibited. The wages paid in the execution of this contract shall be those generally accepted as current in each trade for competent workmen in the district where the work is carried out."

"The representatives of the trade unions who gave evidence before the committee desired that instead of the expression 'The wages paid in the execution of this contract shall be those generally accepted as current in each trade,' the clause should require the contractor to pay the Trade Union rate of wages and observe the Trade Union 'conditions.' By 'Trade Union rate' the witnesses with few exceptions intended a rate agreed upon with the employers and actually in force and under Trade Union 'conditions,' they included the regulation of the hours of labour, the proportion of apprentices to journeymen, employment of boys, women, and girls, and some other matters."

The committee, on a careful review of the evidence, failed to see how the substitution of the phrase "Trade Union rate of wages" for "current rate of wages of the district" would enable the objects of the Fair Wages resolution to be more effectively attained, because, in practice, "if in a given district the Trade Union succeeds in establishing a rate which is so far accepted by employers that the majority of the workpeople in that district do in fact obtain the rate, then the Trade Union rate is the 'current rate' of the district, and is the rate which the contractor under the present form of contract already is compelled to pay on Government work carried out in the district."

The committee further point out that it is only in those cases "where the Trade Union rate is not the current rate, that any change would be effected by the proposed amendment, and in such cases the Government would hardly be justified in imposing the Trade Union rate on its contractors."

"A rate demanded by a Union, but not in practice obtained, or a rate agreed on by only a minority of employers and workpeople, or which by change of process has become obsolete, can scarcely be the 'current rate' intended by the Fair Wages resolution, or represent the market price of labour, which is all the Government should pay for its work."

"Where there is no Trade Union the proposed form of clause becomes meaningless."

The foregoing remarks have been quoted freely from the committee's report because they cannot be gainsaid by any fair minded person cognisant of the facts.

The committee concluded "not to recommend that the words 'Trade Union rate of wages' should be substituted for 'current rate,' because such a modification would be either superfluous or inequitable."

They further remark "that the proposed enforcement of 'Trade Union conditions,' in addition to the rate of wages, met on the whole with great opposition from the employers who gave evidence, although some had no objection to the enforcement of such conditions as had been mutually agreed on."

The obvious intention, therefore, of the motion which Mr. Hodge is to propose is to over-ride the considered judgment of an impartial committee which has heard and carefully weighed the evidence of both employers and employed.

To those who know the kind of Fair Wage Clause which the Trade Unions are constantly trying to have adopted by public bodies in all parts of the country, the wording of the motion signifies a good deal more than it expresses.

It begins by saying that the contractor shall *under penalty* do certain things.

As an example of what the operatives mean they have put forward at Oldham the following clause as to penalty:—

"Failure on the part of contractors to comply with any conditions set forth in this clause shall leave the council power to cancel the contract or call upon defaulting contractors to pay to the council any sum not exceeding £500. From any sum so obtained payments shall be made to workmen to cover any loss which it may be proved they have suffered by breaches of any of the conditions herein stated."

This is a very different thing from the usual penalty clause for breach of contract which governs all such breaches, and is subject to an arbitration clause. The workmen want a special penal clause for their especial benefit, and one which would be oppressive to contractors.

The motion goes on to say: "Pay to all workmen in his employ not less than the minimum standard rate of wages recognised by *trade societies* in the district."

Fair Wages Clause in Government Work.

Now the usual meaning attached to the words "trade societies" is workmen's Unions, and if this is what the mover means, then the plain intention of the resolution is to compel the employers to pay whatever rate the "Trade Union" decide to be the standard rate, whether the employers agree thereto or not, and whether they are able to obtain an ample supply of non-union labour at lower rates or not. If however a wider interpretation is given to the words "trade societies," and they are meant to cover societies of both employers and employed, the expression is ambiguous, because there is no provision for agreement, and if the employers' society recognises one rate and the workmen's another, the situation becomes absurd. In either case neither the Trade Unions nor the employers' societies, in the building trade at all events, represent more than 20 per cent. to 30 per cent. of those engaged in the industry, and the net result of such a resolution being approved and put into practice would be to compel all contractors for Government work and all operatives desirous of working on Government contracts to join the trade societies in order to have at least a voice in the matter.

The motion goes on to say that if there be no recognised rate, etc., in a district, then the rate and conditions of the nearest district shall prevail in the district having no rate.

This again means more than appears on the surface. Many factories exist in country districts near large towns or cities. They go there, among other things, to obtain cheaper labour, and such labour is obtainable without hardship to the worker because living is cheaper in such places.

The smallness of the population in country places and the scattered positions of the factories, make it difficult for a rate recognised by trade societies to exist, and generally no such trade societies are to be found in such districts, as it does not pay to organise there.

The movement of factories from town to country is on other grounds recognised as a desirable movement and an increasing one.

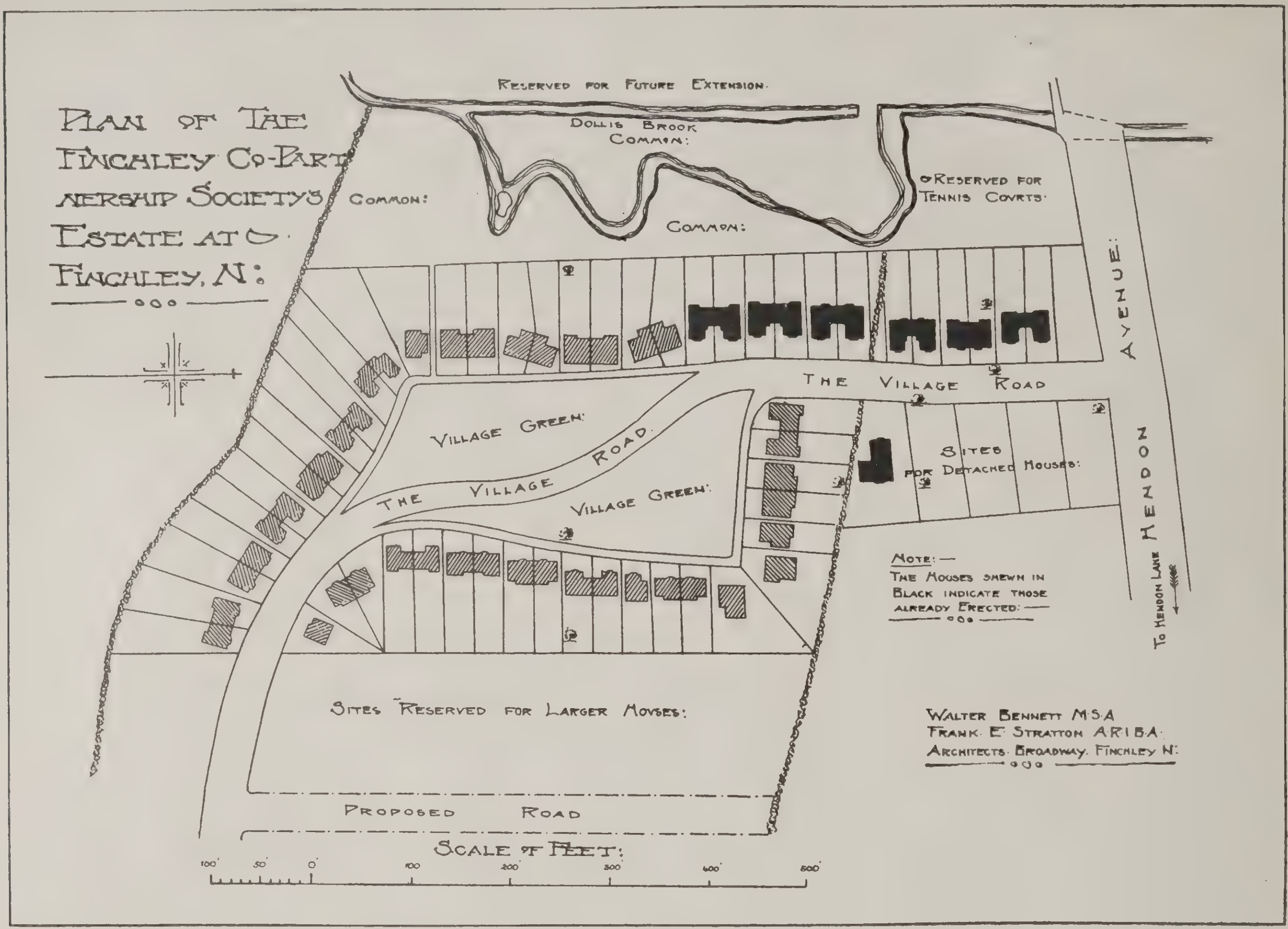
The effect of the proposal put forward by Mr. Hodge would be to compel employers in such places to pay the rate prevalent in the nearest town or city, generally 5 per cent. to 10 per cent. higher, and to entirely check this so desirable migration of workers from town to country.

It is to be hoped that employer Members of Parliament will not fail to expose the fallacies and unfairness underlying this apparently simple proposal, and that the Government will not be constrained to throw over the very fair and thoroughly practical report of their Treasury Committee.

It is evident that the Fair Wages Clause adopted for Government contracts is likely to serve more or less as a model for other public bodies, and any special features secured by the workmen are sure to be pressed upon such bodies as having been adopted in Government contracts.

Employers' associations should carefully watch this question of Fair Wages Clauses wherever it crops up, and steadily oppose sound commonsense to the doctrinaire proposals so frequently put forward by the workmen's representatives in the shape of fair wages clauses. With the ostensible object of a fair wages clause employers quite sympathise, and where workmen take the employers into their confidence and invite their co-operation in the drafting and presenting of suitable fair wages clauses, they will readily attain such objects. We do not think they really mean to insist on impracticable proposals once they realise their impracticability, but the men should remember that only those who wear the shoe know where it pinches; and while this statement is true of their case it is equally true of the employers' case, and that in common fairness they should join at the drafting of all such clauses as are here treated of.

Mr. Yates, who has just been installed as president of the Institution of Heating and Ventilating Engineers, is a member of the well-known firm of Matthews and Yates. He is also chairman of the Swinton and Pendlebury Council Electricity Committee, and is a member of the Manchester Association of Engineers.


PLAN OF THE FINCHLEY CO-PARTNERSHIP SOCIETY'S ESTATE AT FINCHLEY, N:
RESERVED FOR FUTURE EXTENSION.
DOLLIS BROOK COMMON:
COMMON:
COMMON:
RESERVED FOR TENNIS COURTS.
THE VILLAGE ROAD
AVENUE:
HENDON
TO HENDON LANE
VILLAGE GREEN:
THE VILLAGE ROAD.
VILLAGE GREEN:
SITES FOR DETACHED HOUSES:
NOTE:— THE HOUSES SHEWN IN BLACK INDICATE THOSE ALREADY ERECTED:
SITES RESERVED FOR LARGER HOUSES:
WALTER BENNETT M.S.A
FRANK E. STRATTON A.R.I.B.A.
ARCHITECTS. BROADWAY. FINCHLEY N:
PROPOSED ROAD
SCALE OF FEET:
100' 50' 0' 100 200 300 400 500

FINCHLEY GARDEN VILLAGE.

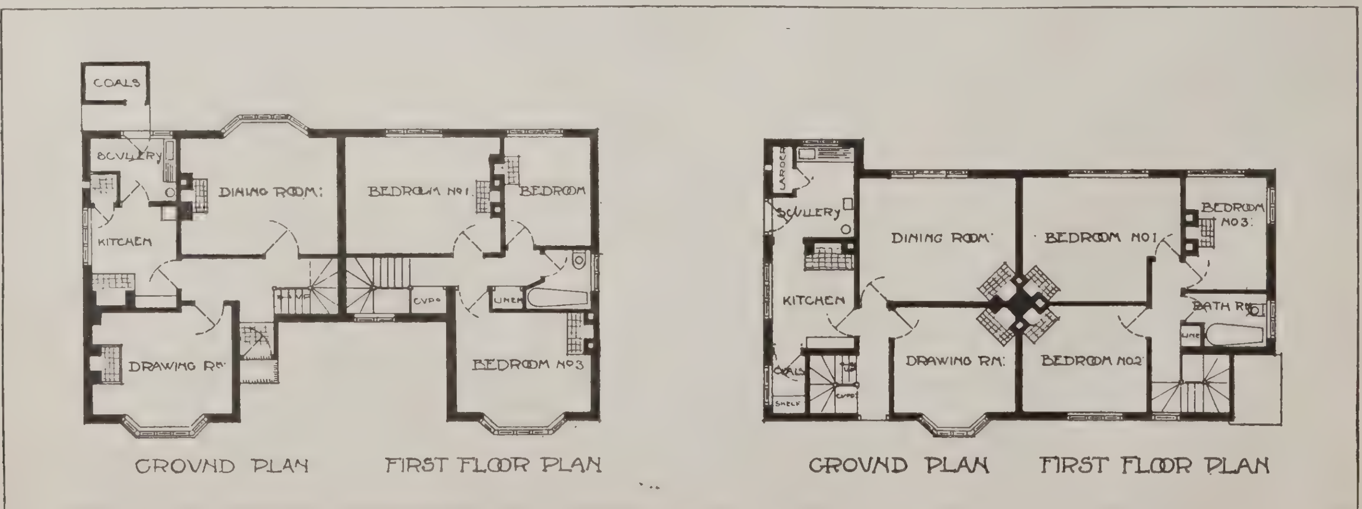
This modern village, which is being developed under the auspices of the Finchley Co-partnership Society, Ltd., is on a portion of the Grass Park Estate, Church End, Finchley. The site is well suited for the purpose, surrounded as it is by a typical bit of English scenery. The scheme includes a large central green, around which the majority of the houses will be grouped, and also a prettily wooded recreation ground, through which winds a brook well stocked with fish. The houses are designed in a simple style with various kinds of plaster work, green weather boarding and sand-faced tiles. The majority are semi-detached with about 30ft. frontage. The first section has been carried out by Messrs. Neward and Shadbolt, builders. The architects are Messrs. Bennett and Stratton, of Finchley, N.

Proposed New Works.

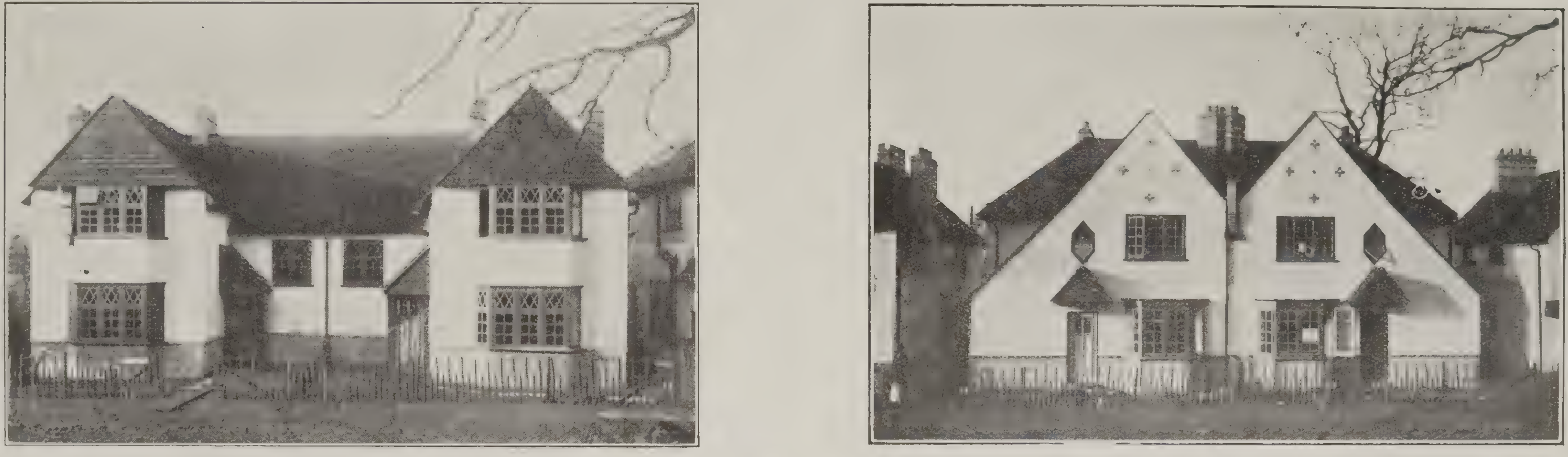
ABERDEEN.—Plans for the following works have been approved by the Town Council:—Alterations, dwelling-house, 93, Crown Street, for Mr. George Wood, per Mr. Harvey Mennie, architect; alterations and additions, premises, for the Aberdeen Mutual Sawmilling and Boxmaking Company, Ltd., per Messrs. Taylor and Anderson, solicitors; alterations No. 10, George Street, for Messrs. J. Hepworth and Son, Ltd., clothiers; alterations Nos. 141, 145, and 149, Union Street, for Dr. George W. Park, Penang, per Messrs. J. and A. Edmond, advocates; dwelling-house, Westburn Road, for Mr. Adam Copland, painter, per Mr. Arthur C. Bruce, architect; aerated water manufactory, Seaforth Road, for Messrs. Sang and Co., per Messrs. Jenkins and Marr, architects; three dwelling-houses, King Street, for Mr. Henry Hutcheon, per Mr. Duncan Hodge, architect; workshops, St. Clair Street, for Mr. William Adams, cartwright, per Mr. William Smith, architect.

BEXHILL.—The Town Council has approved plans for the following works:—Six detached houses, Woodville Road, Mr. J. W. Webb, owner; Mr. J. B. Wall, architect; detached residence, Little Common, Mrs. Hitchins, owner; submitted by Messrs. Stevens and Son.

BRADFORD.—A proposal to rebuild the Royal Infirmary was made at a meeting, on February 26th, of the donors and subscribers, presided over by the Lord Mayor. The sum of £150,000 to £200,000 was indicated as the probable cost.

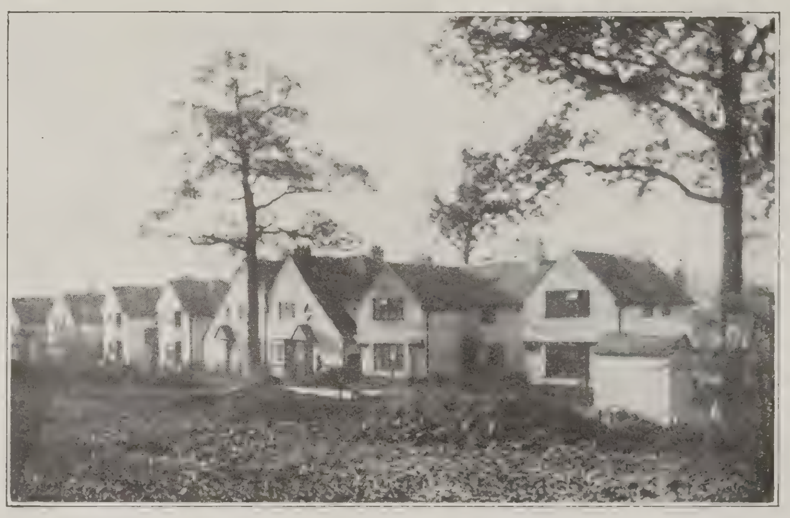


TWO TYPES OF HOUSES AT THE GARDEN VILLAGE, FINCHLEY. BENNETT AND STRATTON, ARCHITECTS.



TWO TYPES OF SEMI-DETACHED HOUSES AT THE GARDEN VILLAGE, FINCHLEY.

A GENERAL VIEW OF THE GARDEN VILLAGE, FINCHLEY.



VIEW OF THE ROAD, GARDEN VILLAGE, FINCHLEY.

BENNETT AND STRATTON, ARCHITECTS.

NOTES ON BRICKS AND BRICKWORK.

By Alfred B. Searle

WHY SOME BRICKS LAY BADLY.

When bricks were all made by hand the bricklayer's chief concern was to obtain bricks of a sufficiently accurate shape so that the joints would be of even thickness and the general appearance of the work satisfactory. With hand-made bricks the nature of the clay used and the temperature at which it is fired are both in favour of the bricklayer, and the only source of trouble is the irregular shape and size of some of the bricks, especially when clamp-burnt bricks are used. Consequently, most hand-made bricks will lay well, providing that they are sorted with reasonable care, the badly shaped bricks being reserved for filling up or backing.

With the increasing difficulty in obtaining skilled men as moulders, which has been experienced during the last few years, and with the enormous demand for cheap bricks in large quantities, which has been so characteristic of the last two decades, it was only natural that use should be made of machinery to supplement the output, and for a long time past the machine-made brick has increased in popularity and usefulness, until it is the chief product of most of the brickworks in the country, hand-made bricks being confined to small yards and sparsely populated localities, with a few notable exceptions.

Fortunately or otherwise, the application of machinery has resulted in the production of a brick of entirely different qualities from those possessed by bricks made by hand, and whilst the newer styles of bricks can be made more accurate in shape, and often more even in colour, many bricklayers find that when in use the structure is not as strong as it should be. In other words, the bricks do not "lay" well.

The causes of this trouble are of three main types—those connected with the absorptive power of the bricks, those allied to the burning of the bricks, and irregularities in composition due to the less thorough or insufficient treatment accorded to the clay. Of these the first is by far the most important, as it is on the power of adhesion between the mortar and the brick that the strength of the brickwork depends.

It is almost impossible to lay bricks made of a smooth and non-absorptive material (such as polished glass) satisfactorily, for there is nothing to which the mortar can adhere, and whilst it is not true to state that the strength of the brickwork depends on the water-absorbing power of the bricks, this characteristic is an important factor in a consideration of the subject.

For most purposes bricks should absorb at least one-sixth of their weight of water, and many bricks will absorb as much as one-fifth or even one-quarter of their weight, but these must be regarded as more porous than is either necessary or desirable. A very high porosity or water-absorbing power implies that a brick has not been fully burnt, though too much stress must not be laid upon this statement, as certain sandy clays will not make dense and non-porous bricks. The higher the temperature reached in the kiln the greater the probability of dense, strong, but non-porous bricks being produced. This high temperature is all to the good up to a certain point, but beyond this the bricks will soften and twist or warp, or in other ways lose their shape, and their colour will be changed. Even when heated to a temperature just below the softening point, whereby the bricks attain their maximum strength, it may happen that the colour produced is considered undesirable by the customers, and the lack of porosity may prejudice the bricklayers against the use of a brick which is in many ways superior in durability and strength to others from the same clay fired at a lower temperature.

The brickmaker must therefore effect a compromise according to the class of trade for which he caters: he may aim at producing a hard and dense brick suitable for engineering purposes on account of its great strength, or he may prefer to manufacture a stock brick of less strength but more easily laid, and of a very pleasing colour. It is only in exceptional cases that a brick can combine the characteristics of both these classes.

Many bricks made from a shale or easily vitrified clay will produce work of great strength, providing the bricklayers understand their work properly, but these bricks are usually vitrified at the surface (though porous enough in the centre), and unless the mortar used partakes more of the nature of a cement than an ordinary mortar, the adhesion will not be so great as could be wished. Certain well-known bricks are of a peculiar nature in this respect, as owing partly to the method of manufacture employed and partly to the material from which they are made, it is difficult to get mortar to adhere properly to them unless they are "keyed" in some way. All bricks of low porosity are subject to the same disadvantage from the bricklayer's standpoint, but their greater strength more than compensates for this when the bricks are employed for engineering purposes.

There is an increasing tendency to favour the use of partially vitrified bricks, and in an important book for architects recently published, it is definitely stated that no brick should absorb more than one-tenth of its weight of water, *i.e.*, it should only be half as porous as the average brick made fifteen years ago. Whilst much may be said in favour of this low porosity, it is not likely to increase the popularity of bricks with the men who have to lay them.

In testing the porosity of a brick, it is important to decide whether a whole brick or a broken one should be tested, as the two will not yield the same results in all cases, particularly if the bricks are vitrified near the surface, but are more porous internally.

Bricks which are uneven in composition will not lay well on account of the great variations in colour, and if improperly burned it will often be found troublesome to use bricks which are broken into two pieces so as to provide a proper bond. These characteristics are, however, all easily observable to the ordinary bricklayer, and are less likely to cause trouble some time after the masonry has been completed than are bricks to which mortar does not easily adhere.

It must not be forgotten that many bricks are said to lay badly when it is really the fault of the mason and not of the brickmaker. Thus a wall may prove to be weak because the mason has not taken sufficient care in slushing the joint with mortar, in keeping the bricks down to a tight joint, or to the mortar not being spread evenly over the top of the lower course. It is not uncommon in erecting cheap houses to find that the bricklayers place a "dab" of mortar at each end of the brick, and so leave a hollow space in the centre, which is a source of weakness instead of strength to the structure. When this is done with "butter" joints, the weight of the wall may be sufficient to cause the bricks in the lower courses to spall. This may be entirely avoided by taking care that the centre of the bed is properly supplied with mortar.

Bricks are sometimes blamed for weakness when the real evil is a faulty bond, for one of the chief sources of strength in a wall is the headers used in its construction. In fact, no high wall can be built securely unless an ample supply of headers is provided; it would collapse. In any case, it is essential that no wall should be built without there is a header course or its equivalent in at least every five courses, and it is better to have every third course constructed of headers. It is not, of course, necessary that these headers should be seen from the face of the wall, and, if desired, a "secret bond" can be employed.

Another cause of difficulty in laying bricks is due to the architect overlooking the fact that a thoroughly sound bond can only be made if the various parts of the building are made to brick dimensions. If this is not the case, the bricks must be cut or rubbed to fit, and this is both time-consuming and costly. On this account also bricks should, as far as possible, be made to certain well-defined sizes, and notable variations from these "standard sizes" should be rejected except for special work. This is most necessary when hard pressed bricks are used. Bricks of unusual size or shape are always more costly, though if used alone or in connection with work into which they bond properly, no special difficulty need be experienced in the laying.

In short, some bricks are difficult to lay because of the defects in their manufacture—they are out of shape, or too close in texture —whilst with others the fault is with the bricklayer himself, or with the architect.

THE FORTHCOMING BUILDING EXHIBITION.

The nearer the approach to the opening date of the forthcoming Building Trades Exhibition at Olympia, the greater the force of its promoters' contention that no such trade exhibition as that of April next will prove to be has ever been held in this or any other country. Olympia has become the acknowledged home of successful trade exhibitions. It is the largest building of its kind in London. Yet the promoters of the Building Trades Exhibition are hard put to it to find suitable accommodation for all the would-be exhibitors.

The galleries represent a complete municipal section for the special requirements of borough surveyors, while from end to end of the Main Hall and Annexe, every available inch of space has its quota of exhibits allocated exclusively for the use of the architect and the builder.

We are glad to observe from the plan of the forthcoming exhibition, which we have had an opportunity of examining, that every branch of the building trades is again most thoroughly represented. Not only are all the firms who had the most prominent positions at the record exhibition of 1907 again in evidence (in many cases with increased spaces), but many well-known firms will be found exhibiting this year for the first time.

The exhibition will therefore afford a unique opportunity of examining under one roof all that is most up-to-date in building and its direct accessories.

The Yorkshire Master Painters' Federation attains its majority this year, and the event has been celebrated at York, where the Federation was welcomed by the Lord Mayor of York. An exhibition of apprentices' work was an important feature of the celebration, and the awards in the competition (in which the judges were Councillor Hibbett, Mr. Ward, and Mr. Chappell) were as follows:—Class I. Apprentices over 18 years and under 21 years of age.—Glass writing: 1, E. Dean, Bradford; 2, G. S. Bellerby, York. Sign writing on wood: 1, L. Lancaster, Hull; 2, E. Dean. Graining, plain oak: W. H. Maslin, Hull; pollard oak, G. A. Sykes, Paddock; mahogany, E. Dean; Italian walnut, G. A. Sykes. Tinting: G. S. Bellerby, York. Marbling (black and gold): H. Marshall, Bradford; specially commended. G. A. Sykes. Plain painting: 1, "Tong," Huddersfield; 2, G. Lancaster. Decoration frieze: 1, A. Colley, Hull; 2, G. Lancaster. Time test, graining panels: H. Wadsworth. Gold Medal, given by the president: Edward Dean, Bradford. Class II. Apprentices under 18 years of age.—Glass writing: 1, A. Bennett, Bradford; 2, C. Wood, Hull. Sign writing on wood: 1, Chas. Wood, Hull; 2, Arthur Bennett, Bradford. Graining: Plain oak, Charles Wood, Hull; pollard oak, C. Wood; mahogany, C. Wood; American walnut, C. Wood. Tinting competition: A. Bennett, Bradford. Marbling: Red granite, C. Wood. Plain painting: 1, A. Bennett; 2, W. Abbey, York. Decorative frieze: 1, "Don," Huddersfield; 2, A. Barton, York. Vice-President's silver medal: Charles E. Wood, Hull.

Photo: Topical.

GENERAL VIEW OF THE LONDON AND SOUTH-WESTERN RAILWAY DOCK EXTENSION, SOUTHAMPTON.
TOPHAM, JONES AND RAILTON, CONTRACTORS.

BROMSGROVE.—The R.D. Council have approved plans for the following works:—Addition to Mission Room at Barnt Green; alterations to Ewe and Lamb Inn, Stoke Heath; house at Hopwood for Mr. J. Smedley Crooke.

COLVEND, NEAR DALBEATTIE.—It is proposed to build a new church here. About £800 has been subscribed, and the committee are endeavouring to arrange for a site.

DERBY.—The L.G. Board have held an enquiry respecting an application by the Town Council to borrow £12,000 for the extension of the Borough Lunatic Asylum. There was no opposition.

DUNDEE.—Plans for the following new buildings are before the City Council:—American Muir Road, Downfield, alterations on property for A. M. Neill: Lochee Road, temporary warehouse for Ballingall and Son, Limited; North Lindsay Street, stores, etc., for Halley Brothers, Limited; Old Craigie Road, cottage for William Lilburn, semi-detached villas for B. Anderson, alteration on dairy premises for D. C. Guthrie; Russell Street, workshop for John Nicoll; South Ward Road, warehouse for Don Brothers, Buist, and Company, Limited.

EASTBOURNE.—The Town Council has approved plans for the following works:—Eastbourne Ice Co., addition to ice works, Beach Road; E. Littleton, six houses, Archery Road; Eastbourne College Co., Assembly Hall, Eastbourne College; T. H. Sawyer and Sons, eight houses, Victoria Drive; Eastbourne Gas Co., addition to warehouses, rear of Sussex Gardens.

EDINBURGH.—The Provincial Committee for the training of teachers are looking for a site for a central training college.

ETON DISTRICT, BUCKS.—The R.D. Council have approved plans for the following:—House in Marsham Way, Gerrards Cross, for Mr. E. G. Hodgkins; bungalow at Cippenham for Mr. A. Chennells; house in Chesham Road, Denham, for Mr. W. A. Smith; pair of cottages at Burnham for Mr. W. Guiseley; house in Marsham Way, Gerrards Cross, for Mr. H. Greeves; house in Parsonage Lane, Farnham Royal, for Mr. R. C. Hankinson; dairy at corner of South Park and Oak End Waye, Gerrards Cross, for Mr. J. H. Maggs; house, Pack Horse Road, Gerrards Cross, for Messrs. Franklin and Fisk; house in Bulstrode Way, Gerrards Cross, Mr. T. M. Browne; house, Layter's Way, Gerrards Cross, for Mr. C. P. Lovell; pair of cottages, in Wexham Street, Stoke Poges, for Mr. F. Hartley; two cottages, One Pin Lane, Farnham Royal, for Mr. F. H. Pullen; roads on the Park Estate, at Gerrards Cross, for the London and Country Investment Company.

GLASGOW.—Linings have been granted at the Dean of Guild Court for the following works: — The Hyndlands Building Company, to erect five tenements of dwelling-houses at the corner of York Drive and Airlie Street, Hyndlands; St. Mungo Property Co., Ltd., to erect a garage and repairing shop at 304, Byres Road.

HALE, CHESHIRE.—A new Congregational Church is to be built here at a cost of from £8,000 to £10,000, of which about £4,000 has been collected.

LONDON, W.—The new Radium Institute, of which His Majesty the King is patron, is to be erected in Riding House Street, by the Queen's Hall. Mr. T. Phillips Figgis, F.R.I.B.A., of 28, Martin's Lane, Cannon Street, E.C., is the architect. The building will be in two parts with separate entrances. One section will be devoted to the necessitous patients, and the other to the well-to-do. The former will be treated free of charge, while the latter will be required to pay fees on such a scale as the medical and surgical staff may determine.

SWANSEA.—The Corporation Asylums Committee has requested Mr. G. T. Hine, F.R.I.B.A., F.S.I., of 35, Parliament Street, London, S.W., to visit Swansea for the purpose of inspecting sites in or near the Borough suitable for a new asylum.

TWICKENHAM.—The U.D. Council are selecting a site for a new elementary school at East Twickenham.

WEASENHAM, NORFOLK.—Under the will of the late Earl of Leicester, a sum of £5,000 has been left for the restoration, decoration, and furnishing of All Saints' Church.

Obituary.

We regret to announce the death of Mr. Cole Alfred Adams, F.R.I.B.A., of 66, Victoria Street, S.W. Mr. Adams was born at Sudbury in Suffolk in 1845, and died on February 21st, at 13, Glazebury Road, Chiswick, after a three months' illness. He was with Mr. Street for some years, and was engaged on the church at Bournemouth designed by Mr. Street. In the year 1867 he was presented with a number of architectural books by the various public institutions in Bournemouth, in recognition of the valuable services he had rendered to them. He was for some short time in the office of Mr. Butterfield, and has often spoken of the useful discipline that was exercised in that office. He started practice in Westminster, and was elected an associate of the Royal Institute of British Architects in 1874, and a Fellow in 1880. In 1880 he joined the Architectural Association, and took an active part in its work from the first. In 1884 he was elected president, and was paid the compliment of a second year in office. At that time the presidency was usually only for one year. He was the first architectural association president to be elected on the Council of the Royal Institute of British Architects. He was joint secretary with Sir Aston Webb of the Competitions Memorial Committee, and took an active part in the reforms that have been introduced into competitions. He also was on the Board of Examiners. Those who were associated with him became sincerely attached to him. He always treated everyone with a courtesy that made them respect him, and this, with his simplicity of purpose, made him a charming colleague to work with.

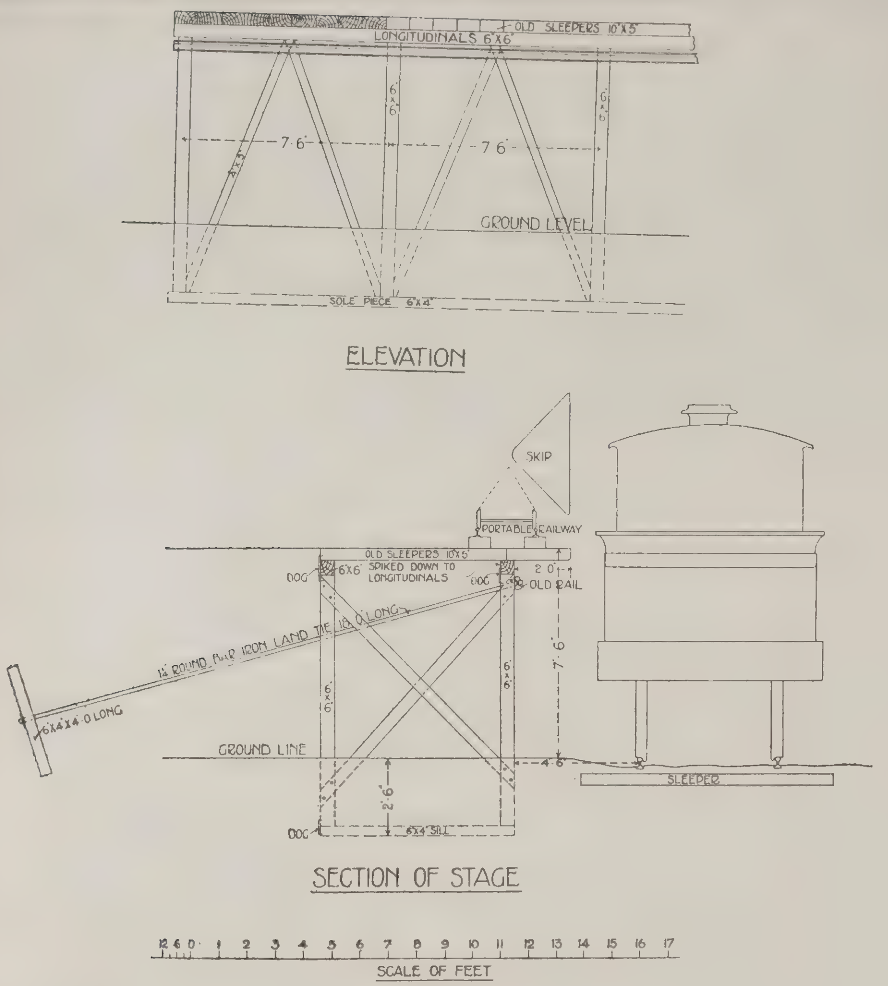
Perhaps it was his white hair which gave him a venerable appearance and made his presence take the character of an elder brother in the family party, but he never presumed on this feeling, and to the last always explained his opinion with almost an apology for differing from others in the discussion.

One of his great hobbies, and the side of his profession that he took the keenest interest in, was colour decoration, and for many years he conducted a colour class at the Architectural Association, and took a keen interest in the work of his class. He did a good deal of decorating work in private homes, and in 1902 exhibited at the Royal Academy designs for the decoration of the drawing-room of a house at the Boltons, South Kensington. He designed a mission church at Grinham; additions to St. Mary Magdalene, Trinity Road, Wandsworth Common; and the decoration of the screen at St. Andrew's, Stockwell Green; and his own church at Chiswick, where he improved and decorated the parish hall.

Mr. Adams, until his first illness, some two years ago, was for many years a powerful reciter, and as the testimonial given him at Bournemouth shows, was always at the service of good causes.

Mr. R. A. Nicholson, of Stockton-on-Tees, who has died at the age of 36 years, was formerly a builder and contractor in business with his father (Mr. R. Nicholson), who died two years ago. About four years ago he and his father built the Hippodrome Theatre at Stockton, and at the time of his death Mr. Nicholson, jun., was the sole proprietor. He was at one time a member of the executive committee of the Stockton-on-Tees Master Builders' Association.

It may be supposed that the attention that has been given to the design of the Marble Arch lamps will have an important influence on the future design of lamps in this country. The lamps, which have been made in Mr. Bainbridge Reynolds's workshops at Clapham, are fourteen in all. The four at the Royal entrance each weigh nearly one ton, and measure 9ft. 10½ins. from the base to the top. The style of the design is a free rendering of the Louis XVI. period, and the lamps are made of fine cast iron, the more delicate panels and ribs being in cast bronze.



A TIMBER STAGE.

A TIMBER STAGE

For Unloading Ballast or Coal at Railway Sidings.

By Hugh S. Cregeen, A.M.I.C.E., P.A.S.I.

The stage or dock illustrated is one suitable for erection alongside a railway siding, for loading or unloading ballast, coal, or other material, and is of such a height that the trucks can be conveniently worked from. The stage is 7ft. 6ins. above rail level, and the main front is kept 4ft. 6ins. away from the rail, so that plenty of clearance is provided and there is no danger of men getting jammed between the front and passing vehicles. It also complies with the Board of Trade regulations in this respect.

The construction may be stated thus:—6in. by 6in. uprights are braced together in bays, 7ft. 6ins. apart centre to centre, and having 6in. by 6in. longitudinal timbers back and front, on which good second-hand sleepers 10in. by 5in. are spiked to form a floor. The uprights are let into the ground about 2ft. 6ins., and rest on 6in. by 4in. sole pieces. The floor projects 2ft. beyond the main front of the dock, so as to get as close as possible to the trucks; and on this projection a narrow gauge railway or trolley road is laid, so that skips of materials can be easily handled. The skips are of the side-tipping variety, and a portable timber shoot enables ballast, etc., to be shot into the trucks with a minimum of waste. To further strengthen the stage and prevent any change of tipping, over-land ties, consisting of 1¼in. round bar iron, 18ft. long, attached to old rails fixed longitudinally along the front of the stage, are inserted at every alternate bay.

Messrs. Lovegrove and Papworth, of 374-8, Old Street, E.C., architects and surveyors, have succeeded to the practice carried on for many years by the late J. H. Richardson, at 22, King Street, Hammersmith, W. Both addresses and telephone Nos. are retained.

ROSYTH GRANITE CONTRACTS.

In the House of Commons, on February 22nd, Mr. John Ward asked the First Lord of the Admiralty whether Messrs. Easton, Gibb, and Son had made a start with the actual work of their contract at Rosyth; if so could he state the number of men now employed upon the works, and the wages paid to such men; whether competent men only would be engaged upon the works; or had his Department made any stipulation with the contractors to give preference to the local unemployed.

The Secretary to the Admiralty (Dr. Macnamara): I understand the contractors have not yet started work at Rosyth. They are required to employ competent men, and are not bound to give preference to the local unemployed.

Major Anstruther-Gray (U., St. Andrews Burghs): When is the work going to be started?

The Secretary to the Admiralty: I should think pretty soon.

Mr. Leverton Harris (U., Tower Hamlets, Stepney) asked whether the tenders for the construction work provided for the use of British granite; if not, from what country would the granite be obtained; what was the value of the granite which would be used; and what proportion of the value approximately represented wages.

The Secretary to the Admiralty: Contract prices were asked for British and foreign granite. In the tender accepted foreign granite is provided for. A sample of granite has not yet been approved, but the granite will probably come from Scandinavia. The value of the granite is estimated at about £105,000. British granite would have cost £134,000. It is not possible to say what proportion of the value approximately represents wages.

Mr. Leverton Harris: Can the hon. gentleman say whether a fair wages clause is insisted upon in British contracts, and whether a similar clause is insisted upon in foreign contracts? Can the hon. gentleman also give the House an idea of what wages are now being paid, and hours worked in the Scandinavian quarries?

The Speaker: The hon. member ought to give notice of that question.

Mr. W. Redmond (N., East Clare): May I ask whether any estimate for the supply of granite was asked for from Ireland, and whether the hon. gentleman could not see his way to get an estimate from Ireland before the order was given for Scandinavian granite?

The Secretary to the Admiralty: I assume Irish merchants could tender. Whether they did or not I cannot say. At any rate, the contract is now settled.

Mr. Redmond: Were the Irish granite quarry owners invited to tender?

No answer was given.

Mr. Chiozza Money (L., North Paddington): Will the hon. gentleman say whether granite is a raw material or a manufactured article?

Mr. Claude Hay (U., Shoreditch, Hoxton): Will the hon. gentleman cause an official inquiry to be made into the relative merits of British and foreign granite?

Mr. Myer (L., North Lambeth): Can the hon. gentleman say whether or not the wages in Scandinavian quarries are almost indentical with the wages in the quarries of this country?

The Speaker: The hon. member must give notice of that.

Mr. MacNeill (N., South Donegal): Having regard to the fact that the Scandinavian quarries have been preferred to the Irish, will the hon. gentleman say who are the owners of the favoured Scandinavian quarries?

The Secretary to the Admiralty: I cannot tell the hon. member without notice.

Mr. W. Redmond: Was a request for tenders published in the Irish newspapers?

The Secretary to the Admiralty: I must have notice of that.

Mr. Leverton Harris: Was a fair wages clause introduced in the contract?

The Speaker: The hon. member must give notice of that. It does not arise out of the question.

Many other questions, of similar import were asked at subsequent dates.

Law Case.

Locating a Leaking Pipe: Water Board Recovers Cost of Excavating & Reinstating.

The case of "The Metropolitan Water Board v. The Imperial Property Investment Company," heard in the Westminster County Court, recently, was a claim for 15s. 2d. on a point as to liability for expenses incurred in locating a leaking pipe.—It appeared that the defendants were the owners of property at Chiswick, and the Board claimed for certain work in connection with a leak in the pipe supplying those premises. Section 71 of the Act of last year read:—"If it should appear to the Board that by reason of any injury to or defect in any communication pipe, any waste of water or injury or risk of injury to person or property is caused or likely to be caused, it shall be lawful for the Board to execute such repairs as they may think necessary or expedient in the circumstances of the case, without being requested so to do, and the expense incurred by the Board in executing such repairs shall be recoverable by the Board as the water rates in respect of the premises are recoverable." The facts were admitted. The Board excavated, found a leak in the pipe supplying the premises, and gave notice to the defendants, who had plumbers of their own. The plumbers repaired the leak, and the Board reinstated. It was the expenses of excavating and reinstating that were claimed.—Counsel for the defendants said that, while the amount was small, the matter was of importance to the defendants. The claim was not for repairs, but for opening up the road. The Board had to find whether the leak was the fault of the consumer or not, and therefore had to open the road and lay bare the leakage. It was found to be the consumer's pipe, but it might not have been, and then the consumer could not have been called upon to pay anything.—Counsel for the Board drew attention to the Metropolis Water Act, 1871, under section 29, of which 24 hours' notice had to be given, and there might be 24 hours' waste of water. To prevent that the section he had read of the new Act was put in.—Judge Woodfall was of the opinion that plaintiffs were entitled to recover, holding that the expenses claimed were expenses of executing repairs. He thought it fair to read in "in and about." Having excavated, it was found that the concealed pipe was one for which defendants were liable, and the excavating was part of the expenses incurred. There would be leave to appeal. Judgment would be for the plaintiffs, with costs, and if defendants decided to appeal the costs would be on scale B.

Views and Reviews.

A Compendious Manual for Cement Users.

The Everyday Uses of Portland Cement. Published by The Associated Portland Cement Manufacturers (1900), Ltd., at Portland House, Lloyds Avenue, London, E.C. Price 2s. 6d. net.

The aim of this book, as set forth in the preface, is to supply "a comprehensive summary of what might be termed the domestic aspects of the subject, . . . upon which hitherto there has not been much reliable information available." It is not only a guide to the various uses for which Portland cement may be advantageously employed; it contains also much excellent advice as to the methodical and practical preparation and application of the material. Portland cement, it is pointed out, is essentially a British invention, having been discovered by Joseph Aspdin in 1824. It was called "Portland" cement from its resemblance, when set hard, to the famous Portland stone, but it was first made commercially in Kent. Lime concrete, of course, was extensively used by the Romans, and the domes of the Pantheon, and of the Baths of Caracalla and Diocletian exist in proof of its durability, which, however, is much inferior to that of Portland cement concrete. General observations on the nature, constituents, and characteristics of Portland cement, with a glance at the part it plays in reinforced concrete construction, are followed by sections dealing respectively with concrete blocks and moulded concrete, and with various descriptions of aggregates; the physical properties and the selection, proportioning, and general details of mixing and manufacturing; the details of workmanship in constructing and surfacing, with illustrations of the special tools required; reinforced concrete; and concrete blocks and moulded concrete. A large and very important section details various uses of concrete —for foundations and walls, fences and fence-posts, paths and pavements, garden steps and terraces, water troughs and reservoirs, tanks and swimming baths, pipes and sewers, culverts and bridges, churches and halls and dwellings, besides a large number of minor applications to the requirements of country and farm life. "Some Novel Uses for Concrete" include the construction of telegraph posts, tramway and electric light standards, signal-posts and name and notice-boards, railway sleepers, mine props, chimney shafts, shore protection, piles, boats, barges, and pontoons. Many pages of useful memoranda are included, and the book, which is well and copiously illustrated, is a most useful compendium for the cement user, whether lay or technical, and it should be of special value to those who are concerned in estate management. The Associated Portland Cement Manufacturers, Ltd., it is mentioned, employ fully 6,000 people, and their works have an annual capacity of approximately a million tons and a half, or more than ten million barrels; and this book is such an excellent guide and persuasive that the output should be sensibly increased as a result of its publication. Nothing could be better calculated to extend the knowledge of cement and hence to popularise its use. It answers all the natural preliminary enquiries, and many that are more advanced; for it is comprehensive and thoroughly up-to-date.

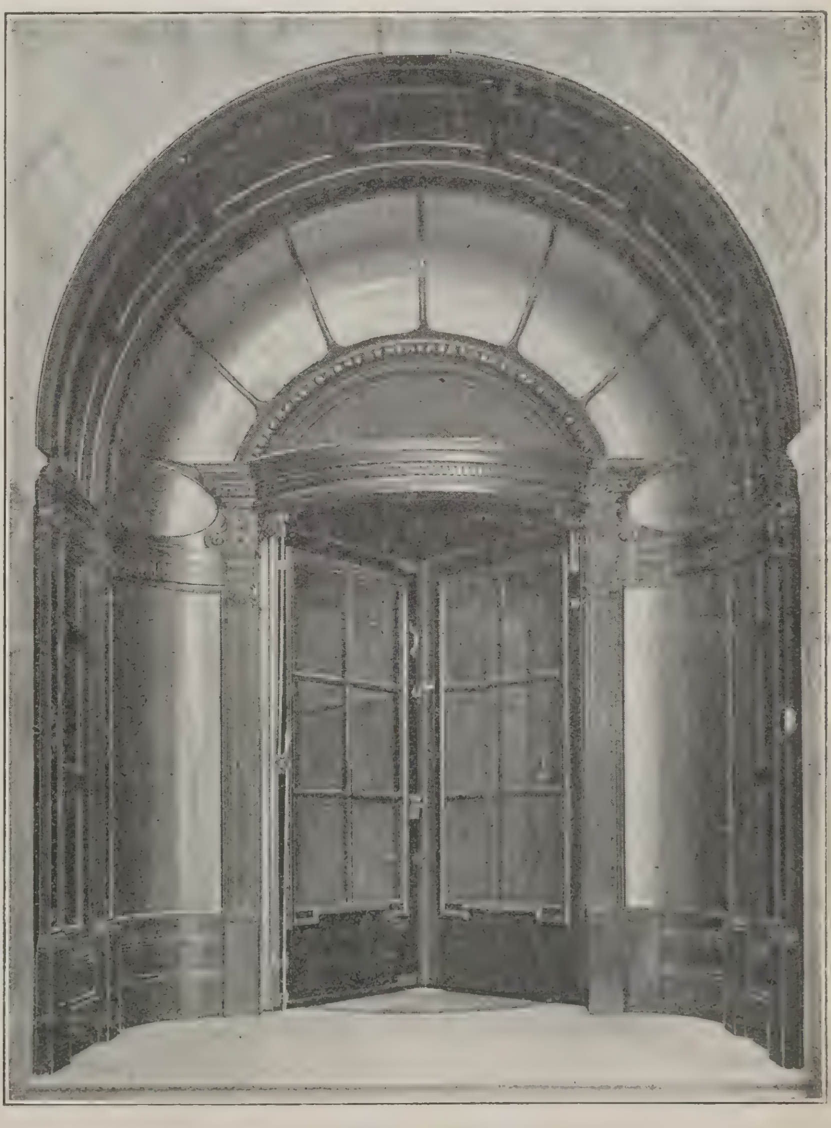
Trade and Craft.

Elliott's Improved Revolving Door.

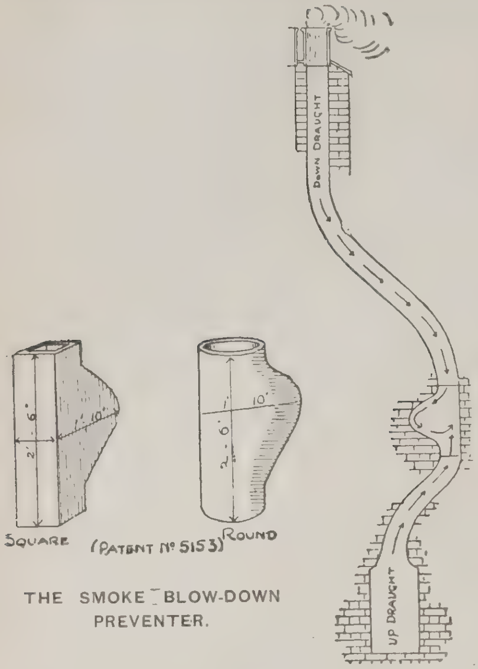
The great advantages of the revolving door —such as its prevention of the inconveniences to the inmates that arise from the opening of the ordinary door, and the inrush of cold air or of rain or dust, and the intrusion of noise, fog, or odour, from the street—were instantly recognised, and this form of door has been extensively adopted for hotels, banks, insurance offices, etc. At the forthcoming Building Exhibition at Olympia, in April next, architects will have an opportunity of examining an improved form of revolving door; or, if they do not care to wait until then, they may see the example that is giving so much satisfaction at the new Welbeck Palace Hotel, Wigmore Street, W., or the similar door that has been fitted at the Shire Hall, Norwich. Normally, the wings of the door radiate from a central axis at the angle shown in the view here given of the door at the Welbeck Palace Hotel. As a revolving door, it works easily and noiselessly, on ball bearings. It has been fully approved by the London County Council, whose requirements it fulfils in every particular. But its efficiency as a revolving door is not all. The wings or leaves are connected by detachable hinges, and, by the turning of a handle, they can be all folded together, bolted top and bottom, and pushed aside so as to leave a clear way through the door opening for the admission of bulky packages, etc. This improved patent door is manufactured by Elliott's Moulding and Joinery Co., Ltd., Albert Works, Newbury.

Prevention of Down-draught in Flues.

Most architects have experienced trouble with down-draught, and would be glad to hear of some simple means of curing what, in many cases, seems beyond remedy. Take the typical case of a house facing south, and built on the slope of a hill rising towards the north. Here, although the architect may have been specially careful in the designing of the flues, and in securing the height of the chimney cans, etc., yet the winds that blow from a northerly direction give rise invariably to complaints of down-blow. The remedy usually adopted is the placing of some pattern (usually very unsightly) of can on the top of the vent to stop the entrance of the downward draught caused by the deflection of the wind from the hill behind. These cans tend as a rule to decrease the draught in the flue, making the smallest pressure of wind on the top naturally more easily felt in a vent in which the draught has been lessened by the use of the can. This downward pressure of wind, descending the flue (which may have curves in its



ELLIOTT'S IMPROVED REVOLVING DOOR.



THE SMOKE-BLOW-DOWN PREVENTER.

longitudinal section) naturally decreases in proportion to the length of travel, the upward draught counteracting the downward. The use of a whirling can in order to increase the upward draught has many disadvantages that need not be detailed, to say nothing of its ugliness. What is required is some means of counteracting, arresting, or dispelling the downward run of pressure, and of giving the upward draught time to counteract it. This requirement is met by the formation of a bulged cavity in the cross-section of the vent. It is not always easy or convenient to get this shape built in brick or stone. The difficulty has been overcome by the patent "smoke blow-down preventer." This device, which is made of fireclay in one piece, to suit vents of all sizes in cross section, is formed of the exact shape required—that is, with the necessary curvative for performing the function indicated. An architect who has adopted it informs us that it has been extremely successful in houses situated in a district where, with the wind coming from certain directions, blow-downs are the rule rather than the exception. The "smoke blow-down preventer" is made by Messrs. Robert Brown and Son, Ltd., Ferguslie Fireclay Works, Paisley, N.B. The preventer is made either round or square, and it may be placed in any convenient and praticable part of the flue, between the fireplace and chimney top, preferably about 4ft. from the top of the fireplace opening, the curved or elbow-shaped enlargement being placed on the lower side of the flue oven. The accompanying illustration shows how a current of air descending the chimney is caught by the enlarged part of the flue and diverted upwards to the opposite side, whence it ascends with the updraught or current proceeding from the fire, thus preventing the smoke from being carried back into the apartment.

Waygood's Hydraulic Lifts and Hoists.

Messrs. R. Waygood and Co., Ltd., of Falmouth Road, Great Dover Street, London, S.E., have just issued the seventh edition of the section of their catalogue (Section 4, Part 3) referring to hydraulic lifts and hoists for passengers and goods. Hydraulic power is specially suitable for passenger lifts, as well as for raising heavy goods. Hydraulic machinery may be worked either on the low-pressure system, by water taken from the ordinary street mains; or by a high-pressure supply obtained by pumping water into an accumulator loaded with weights to the required pressure, which is usually 700lbs. per square inch. The lifts are of two types, direct-acting and suspended. The former are those in which the cage or car is borne directly on the top of a ram or piston. The latter term is self-explanatory. In Waygood's patent hydraulic balanced passenger lift, the weight of the car and load is supported entirely from beneath, and the whole strain on the machinery is therefore always in compression, thus ensuring the highest degree of safety. In Waygood's safety gear, which is illustrated in the catalogue, safety is assured even in the highly improbable—indeed almost impossible—event of five ropes failing simultaneously. Warehouse and wharf cranes, a high-pressure pumping plant, hydraulic accumulators, and various kinds of pumps, are illustrated in this very useful and up-to-date catalogue. It covers the whole range of hydraulic lift work, of which the firm have made a speciality for nearly forty years.

Coming Events.

Wednesday, March 10.

Northern Architectural Association.—Ordinary meeting of Council, 7 p.m.; ordinary meeting and Exhibition of Drawings, 7.30.

Thursday, March 11.

Paint and Varnish Society (St. Bride's Institute, E.C.).—Mr. A. F. Suter on "Technical Notes on Lac," 8 p.m.

Manchester Society of Architects (16, St. Mary's Parsonage).—Discussion on Students' Drawings, 6.30 p.m.

Sheffield Society of Architects and Surveyors (University, Western Bank).—General meeting. Address by Mr. Temple Moore, F.R.I.B.A.

Society of Architects (Staple Inn Buildings, Holborn, W.C.).—Special general meeting to Revise Articles of Association, 7.30 p.m. Fifth sessional meeting: Mr. J. Davies on "Specification and Inspection of Timber," 8 p.m.

Worshipful Company of Carpenters (Carpenters' Hall, London Wall, E.C.).—Mr. Thackeray Turner, F.R.I.B.A., F.S.A., on "Ancient Buildings and their Influence on Modern Architecture," 8 p.m.

Friday, March 12.

South-Western Polytechnic Institute, Chelsea.—Presentation of Prizes and Certificates, by Prof. H. A. Miers, D.Sc., F.R.S., Principal of the University of London, 8 p.m.

Saturday, March 13.

Northern Polytechnic Architectural and Building Students' Association.—Visit to St. Bartholomew's Church, West Smithfield, 2.30 p.m.

Edinburgh Architectural Association (117, George Street).—Visit to Westbank Brick and Tile Works, Portobello.

Architectural Association.—Fifth spring visit, to the Horseferry Electricity Generating Station, Millbank, 3 p.m.

Monday, March 15.

Royal Institute of British Architects.—Mr. Francis S. Swales, on "American Architecture," 8 p.m.

University of London (South Kensington).—Mr. Banister Fletcher, F.R.I.B.A., on "English Renaissance (and Modern) Architecture," 8 p.m.

Wednesday, March 17.

Northern Polytechnic Architectural and Building Students' Association.—Annual general meeting, 8 p.m.

Thursday, March 18.

Leicester and Leicestershire Society of Architects.—Mr. A. Herbert, A.R.I.B.A., on "F. W. Ordish, Architect, and an Exhibition of his Drawings."

Friday, March 19.

Birmingham Architectural Association.—Mr. G. Salway Nicol, A.R.I.B.A., on "Rome and Paris: their Architectural Relations."

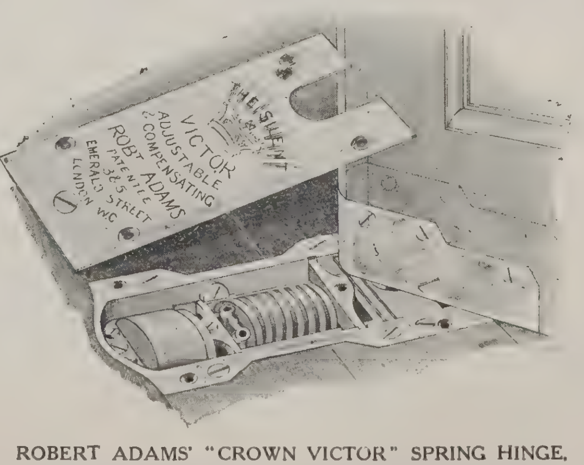
Architectural Association (18, Tufton Street, S.W.).—Mr. J. A. Marshall on "A Lesson from the Past," 7.30 p.m.

Saturday, March 20.

Edinburgh Architectural Association (117, George Street).—Visit to St. Triduana's Well, Restalrig, and to Craigentinny House.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.

PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE,
with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.

60 HIGHEST AWARDS.

The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing.

— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

THE NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS OF GREAT BRITAIN AND IRELAND.

OFFICERS, ETC., 1909.

President:
ERNEST J. BROWN (LONDON).

Senior Vice-President:
COUNCILLOR S. SMETHURST, J.P. (OLDHAM).

Junior Vice-President:
J. W. WHITE (SUNDERLAND).

Hon. Vice-Presidents:

ROBERT NEILL, J.P. (MANCHESTER).
J. HOWARD COLLS (LONDON).
COUNTY ALDERMAN J. BOWEN, J.P. (BIRMINGHAM).
T. F. RIDER, F.R.G.S. (LONDON).
J. STEVENSON JONES (LIVERPOOL).
ALDERMAN W. HOLDSWORTH, J.P. (BRADFORD).
A. KRAUSS (BRISTOL).
B. I. GREENWOOD (LONDON).
C. W. GREEN (LIVERPOOL).
ALDERMAN W. H. JESSOP, J.P. (HUDDERSFIELD).
WM. SHEPHERD (LONDON).
GEO. MACFARLANE (MANCHESTER).
WM. NICHOLSON (LEEDS).
C. H. BARNSLEY (BIRMINGHAM).

Hon. Treasurer:
JAMES WRIGHT (NOTTINGHAM).

Hon. Auditors:
F. HIGGS (LONDON) AND W. THOMAS (CARDIFF).

Representatives on the Employers' Parliamentary Council:
ERNEST J. BROWN (LONDON). WM. SHEPHERD (LONDON).

ADMINISTRATIVE COMMITTEE.

President:—ERNEST J. BROWN (LONDON).

Senior Vice-President:—S. SMETHURST, J.P. (OLDHAM). *Junior Vice President:*—J. W. WHITE (SUNDERLAND).

Hon. Treasurer:—JAS. WRIGHT (NOTTINGHAM).

Senior Hon. Auditor:—F. HIGGS (LONDON). *Junior Hon. Auditor:*—W. THOMAS (CARDIFF).

NOTE.—The above-named are Members *ex officio*.

ELECTED MEMBERS.

Northern Centre—T. WILKINSON (Middlesbrough). W. R. THOMPSON (Dewsbury). GEORGE MACFARLANE (Manchester). JAS. STORRS, J.P. (Stalybridge).

Midland Centre—H. WILLCOCK (Wolverhampton). ALBERT S. SMITH, (Birmingham).

South-Eastern Centre—WM. SHEPHERD (London). W. F. WALLIS (Maidstone). B. I. GREENWOOD (London). J. BELL, J.P. (Cambridge).

South Western-Centre—Coun. W. N. BLACKBURN (Newport, Mon.). E. J. NEALE (Bristol).

Secretary:
A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

MONTHLY OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

The annual report and statement of accounts has been printed and despatched to the respective federations in quantities as required, and should by this be in the hands of members. As showing the increasing volume of the Federation work, it may be mentioned that whereas in 1906 six pages sufficed for the annual report, in the 1908 report twelve pages were required.

The report of the Conference of Secretaries has also been printed, and copies have been distributed to the various Federations, and they should be by this in the hands of every local association.

The members of associations of twelve selected towns have been circularised *re* further support to the Official Journal.

The various fair wages clauses in use by London and provincial boroughs have been examined and considered, and a typical clause for the use of our local associations when dealing with the question of fair wages clauses has been drafted, and as soon as approved by the committee will be issued.

Letters dealing with a complaint as to Government Departments calling for tenders without supplying quantities have been addressed to the Board of Works and the War Office, with what result is not yet known.

Representations as to the probably adverse effect of clause 30 of the Housing and Town Planning Bill have been made to the President of the Local Government Board.

Members of Parliament have been communicated with stating our objections to a resolution on fair wages clauses which is to be moved by Mr. Hodge, M.P., on March 10th, and their assistance asked to defeat the resolution.

Some little difficulty arose lately at Derby as to calling together the local Conciliation Board to deal with a dispute. The Derby Association was advised to submit the dispute to the Board.

The various resolutions of the annual general meeting have been dealt with, and communications to various parties concerned have been made. Visits have been made and meetings addressed at the following places: Leeds, Leicester, Cambridge, and Bournemouth. The last-named association has intimated its intention to affiliate with this Federation as soon as the necessary general meeting can be arranged for.

Letters have been sent to Bedford, Reading, Tunbridge Wells, Barry, Carmarthen, Watford, etc., urging that attempts should be made either to resuscitate the local association or affiliate with the Federation, and offers have been made to visit the places and render assistance. No replies are yet to hand.

Arrangements have been made for a party of our members to visit the International Building Trades Exhibition on the evening of April 20th, at 5.30 p.m., on the invitation of Mr. H. Greville Montgomery, M.P., one of the directors, and circulars have been sent to the Federations giving particulars.

In this connection, it has been decided to hold the next meeting of the Journal Committee at 12 noon on April 20th, the Administrative Committee at 2.30 p.m. on same day, a meeting of the Northern Centre at 10.30 a.m. on April 21st, and a meeting of the Joint Committee under the N.A.O.P. Agreement at 2.30 p.m. on the same day; all at the London Offices of the Federation, 31 and 32, Bedford Street, Strand, W.C. The secretary is under engagement to address a conference of the Midland Centre Secretaries at Birmingham on March 25th. — A. G. WHITE, Secretary.

THE NORTHERN CENTRE OF THE NATIONAL FEDERATION

COMPOSED OF

The Lancashire, Cheshire and North Wales Federation, The Yorkshire Federation and The Northern Counties Federation.

Secretary: JAMES DENVER, Cromwell Buildings, Blackfriars Street, Manchester.

THE LANCASHIRE, CHESHIRE AND NORTH WALES FEDERATION

Secretary: JOHN TOMLISON, Cromwell Buildings, Blackfriars Street, Manchester.

LOCAL ASSOCIATIONS AFFILIATED TO THE LANCASHIRE, CHESHIRE AND NORTH WALES FEDERATION.

ACCRINGTON AND DISTRICT.

Secretary pro. tem.: R. Hall.

The first monthly meeting of the committee of the newly formed Accrington Association was held at the Railway Hotel, Accrington, on Thursday, February 25th, every member of the committee being in attendance, with the president, Mr. James Waddington, in the chair. The association being new, many matters of interest were discussed, namely, provision of a members' telephone card, the appointment of secretary, the consideration of the formation of local conciliation boards under the conciliation rules, and that the rules of the association be submitted to the Lancashire, Cheshire, and North Wales Federation before being printed, so that they would be in order, as it is intended to make application to the Federation for membership.

BARROW-IN-FURNESS ASSOCIATION.

Secretary: J. Baker.

The monthly meeting of the Barrow-in-Furness Association was held on February 27th. Prior to the ordinary business meeting, representatives of master plasterers and operative plasterers met to confer on the question of "tearing" being done by handy men instead of by skilled workmen; also the cementing of floors for wood blocks being done by bricklayers instead of plasterers. The question of indenturing apprentices was also referred to. After the interview was ended, the questions were more thoroughly discussed by the fuller meeting of members of the association, and arrangements were made which will, in all probability, satisfy the operatives.

The question of tendering for work without quantities, the giving of tenders to others than members of the association, and the matter of uniform rates for labour and material for retail work, was thoroughly discussed, and the decision arrived at will, it is hoped, do much towards the extension of the association.

BURNLEY AND DISTRICT ASSOCIATION.

Secretary: C. Astwood.

The first annual dinner of the Burnley and District Association was held on Saturday, February 20th, at Cronshaw's Temperance Hotel. Twenty-one members and friends sat down. After dinner, Mr. Samuel Smith, the President, took the chair. In his opening remarks, he alluded to the necessity now more than ever for combination amongst employers, and urged all the members to do their utmost to encourage those outside the Association to join it. He also intimated that the committee had in view the advisability of having the whole of the members together, say once every three months, when trade topics could be discussed.—Mr. Robt. Smith (of Messrs. Geo. Smith and Sons) advised the members to be very careful in signing for contracts, as some of the conditions would be found to be impossible for members of the Association to carry out. The National form of contract was to his mind the right one, and wherever he had the opportunity, he always advocated its use.—Mr. W. Schofield, slater, and Mr. J. W. Shuttleworth, also addressed the meeting.—The Secretary informed the meeting that three large firms of builders' merchants had joined the Association, viz., Messrs. Brooks and Brooks, the Burnley Brick and Lime Co., and Messrs. J. Duckett and Son, Ltd. He also brought to notice the "Builders' Journal" as the recognised paper for builders, and advised the extension of the inter-trading rule.

BURY AND DISTRICT ASSOCIATION

Secretary: R. Hall.

At the usual monthly meeting of the committee of the Bury Association several matters interesting to the association were discussed, amongst them being the question of sole-contractors bringing sub-contractors into the town from less-paid districts; the admission of new members, and the tendering of members to people outside the association under the intertrading rule.

LEIGH ASSOCIATION.

Secretary: S. Wigham.

The eleventh annual dinner of the Leigh and District Master Builders' Association was held in the Co-operative Small Hall, about seventy persons being present. After dinner the chair was taken by the President, Mr. J. W. Cowburn.

After the usual loyal and patriotic toasts, Alderman W. Bullen, J.P., of Liverpool, president of the Lancashire, Cheshire and North Wales Federation of Master Builders, proposed "The Leigh and District Master Builders' Association." He understood they had nearly all the building trade representatives of the district in their Association, and that was a very healthy sign. In the north they were renowned for their energy and their enthusiasm in the building trade interests. He was a south-country man, but he was sorry that as they went further south they found less and less interest taken in the organisation, and in the extreme south there was practically no interest at all. They were holding their next annual meeting at Portsmouth, to try and arouse some enthusiasm there. If those outside the organisation would only come in and see what they did, they would remain in it. In Leigh they were practising, as well as they knew how, the inter-trading rule. That was one of the best weapons they had. It was introduced into Liverpool a few years ago, and though he was at first opposed to it he recognised by experience that it was the best force they had for bringing those who were outside into the organisation. It did not require, and they would be the last to advocate it, to be harshly enforced. He hoped that by next year the Leigh Association would be able to say that there was nobody outside the Association. He understood also they at Leigh had had some experience of the conciliation scheme. They had had a great deal of experience of that in Liverpool, and he did not know that they were altogether enamoured of it; in fact, some of his friends went so far as to say they would have to give it up. He did not agree with that. They had certainly been very unlucky in the cases they had submitted to the Conciliation Board, and had lost more than they had won; still they had to be patient. The idea of conciliation was a good one. It was better for employees and employers to meet together and talk over their differences in a friendly manner than resort to the barbarous methods of strikes and lock-outs. Still they had to look facts in the

ROBERT HALL,
Building Surveyor,
52, Frederick Street, BURY.

With over 35 years practical experience of the Building Trade, and during the last 15 years a very varied experience in measuring up and adjusting contract and other accounts, is prepared to undertake and submit quotations for the following :—

The Measuring-up and Adjustment of Accounts,
Collection and Settlement of Accounts,
Assistance given in Estimating,
Annual or other Periodical Stocktakings,
Private Enquiries and Arbitrations undertaken,
or any other special work incidental to that of a Builder or Contractor.

52, Frederick St., BURY.

NATURAL ROCK ASPHALTE
(Compressed or Mastic)
For Horizontal and Vertical Damp Coursing
For Flat Roofs, Basements and other floors.

The French Asphalte Co., Ltd.
(ESTABLISHED 1871)
Supply only the best material from their own mine of St. Jean de Maruejols, combined with the best workmanship.
Complete satisfaction given to the leading Architects.
Apply for Prices:—
5, Laurence Pountney Hill, Cannon Street, E.C

D. LORDEN,
Plasterer,
Plaster and Cement Merchant.
Worker in Fibrous Plaster &c,
Tom Brown Street, RUGBY.

For Architects, Builders and Engineers.
TRUE TO SCALE.
BLACK LINE PRINTS.
Permanent. *Done on any Paper or Cloth.*
R's Method of Perspective.
WRITE FOR PARTICULARS.
W. F. STANLEY & CO., LTD.,
13, Railway Approach, London Bridge.
Tel. 871 Hop. Telegrams. "TRIBRACH, LONDON."

T. N.: 14410 Central. T.A.: "Coatostone, London."
Coatostone.
LIQUID STONE
NEAL'S PATENT.
Applied as Paint for Coating
Plaster, Cement, Stone or Woodwork
to produce a natural Stone effect
FOR INTERIOR OR EXTERIOR WORK
THE COATOSTONE DECORATION CO.
77, Mortimer Street, Regent Street, W.

"The Architectural Review."
A Magazine of Architecture and Arts of Design. Edited by MERVYN E. MACARTNEY, B.A., F.R.I.B.A., F.S.A.
Price 1/- Monthly. Annual Subscription 16/- post free.
Technical Journals, Ltd., Caxton House, Westminster.

face. It was necessary for the Federation to get a reserve fund of £10,000, and he hoped the Leigh Association would try to get £5 a year for eight years for that purpose. When they had such a large reserve fund, they would be in a very strong position. That sum would be a kind of insurance, and when workpeople saw that they would pause before taking foolish steps. The Chairman, in reply, said it was ten years since the Builders' Association was formed in Leigh, and he was very proud of the steady progress it had made. They had now 65 members, and were on a solid foundation. He hoped the members would keep together, and if there were any masters outside the Association he hoped they would be persuaded to join at the earliest opportunity. Their relations with the operatives were of a very cordial nature, and he hoped that that happy state of things would continue. With regard to the reserve fund, he could assure Alderman Bullen that that would meet with their serious consideration.

Mr. A. E. Prescott, in proposing the Mayor and Corporation, and the Tyldesley and Atherton District Councils, condemned the Leigh Corporation for building municipal cottages. Those cottages were a charge on the rates. He thought the Corporation and the local councils ought, when they had work, to give it to members of the Association, for the masters were banded together and were not antagonistic to the operatives, and did not try to pull their wages down, but really got them to work under the best conditions. They had an agreement with the operatives, which was loyally observed by both sides. Moreover, all the members of the Association had all their workmen insured. The Corporation, when they were making bylaws, ought to consult the architects and builders, and then we should not have such idiotic by-laws as we had now. Some bylaws added to the cost of the buildings without benefiting the public one iota from a health or any other point of view. Dwellings could be put up at less cost if unimportant by-laws were not so stringently insisted upon.

Councillor C. Owen, J.P., in reply, said the Leigh Corporation did their best to work for the interests of the town, and if the Builders' Association would only make representations to them in regard to by-laws, their requests would get consideration. The Corporation only gave work to those who paid the standard rate of wages.

Mr. H. Harvey proposed "The Architects and Surveyors," and Mr J. Berry, in response, said that, in regard to the Corporation cottages, the Corporation were compelled to build them and the Local Government Board insisted on such specifications that the cost was £175 per house instead of about £120. The fault in that case was not with the Corporation.—Mr. H. Prestwich, in a maiden speech, also replied, and said builders ought to read the conditions of tenders before they signed them. Public bodies sometimes imposed unfair conditions upon builders.

Mr. J. W. Thompson submitted the toast of "The Chairman," and Mr. Cowburn replied.

ROSSENDALE AND DISTRICT ASSOCIATION.

Secretary: Robert Hall.

At the monthly meeting of the Committee of the Rossendale Association, the question of sending in priced schedules along with tenders was considered. On the report of one of the members that one of the borough surveyors insisted on this being done, it was ultimately decided that the secretary, along with one of the members, seek an interview with the said surveyor, and see what could be done in the matter. The question of membership of the association was under discussion, and the feeling was expressed that something more ought to be done, if possible, in trying to strengthen the association.

WARRINGTON AND DISTRICT ASSOCIATION.

Secretary: Bertram B. Moss.

The annual dinner of the members of the Warrington and District Master Builders' Association was held at the Patten Arms Hotel, on Wednesday evening, February 17th. Mr. Henry Collin (the president of the Association) presided, and among the fifty gentlemen present were the mayor (Alderman Forshaw), Mr. H. Roberts, J.P., Mr. William Bullen (president of the Lancashire, Cheshire, and North Wales Building Trades Employers Federation), Mr. Bertram B. Moss (secretary of the Association), Mr. T. Longdin (borough surveyor), Mr. James Deas (water engineer), Messrs. Percy Silcock, F.R.I.B.A., Segar Owen, F.R.I.B.A., Robert Garnett, and Albert Warburton, A.R.I.B.A.

After the customary loyal toast, Mr. H. Roberts proposed "The Town and Trade of Warrington." He suggested that in the present depressed condition of the building trade—although he hoped they had reached the end of a long, narrow, and gloomy lane —the Corporation might pass a little faster some of the public improvements which would assist in providing the opportunity for building operations on a more extended scale and relieve the condition of distress which the present condition of the building trade and the weather had brought about. The Mayor replied. Mr. Bullen, in proposing "The Warrington and District Master Builders' Association," said he noticed that the membership had gone up during the past 12 months from 33 to 62. That was in itself a good indication, because if an association could progress in these bad times he could not help thinking something good about it. He saw that they had sent in notice of their resignation. He read it with great interest, and when he ascertained the cause of it being sent he could not help thinking that he could see something between the lines. It was due to the workings of the Conciliation Board. In Liverpool they had had enough of the conciliation scheme as it existed at present. He did not run down conciliation itself, but found fault with the present scheme. No doubt those who thought the matter out in the first instance did their best and thought it would be a good thing for the trade, but at present he could not see where the conciliation as he understood the word came in. Workmen were using the scheme simply as a weapon to gain their ends, and he was not, therefore, at all surprised that the builders had given notice of resignation from the Federation (which he hoped would only be a temporary affair), in order that they might be able to fight their dispute with their workmen in their own way. The building trade was the leading industry next to agriculture, and yet at the present moment it was about the rottenest industry in the country. He spoke with some amount of feeling based on experience, as he had never experienced such bad times before. But a better tone now prevailed, and he thought they could look to the future more hopefully. The President responded. Mr. Bullen might not take it to heart, nor the Federation generally, that they meant to sever their connection with the parent Federation, but simply to put themselves in Court. They had just at the present time notices running in connection with two branches of the trade, namely, joiners and bricklayers, and they had felt for some time that if they had to submit to the ruling of the Conciliation Board to settle the matter with the workmen they would be worse off than if they tried to settle it amicably between masters and employees. He had no doubt that the same feeling which had existed in the past when they had had to meet the men would prevail, and that they would come to an understanding that would be equally just both to employer and employed. The toast of "The Guests" was submitted by Mr. C. W. Davenport, and responded to by Messrs. Percy Silcock, Segar Owen, Robert Garnett, and Albert Warburton. Mr. Silcock contended that work was done better if good fellowship and good feeling existed between builder and architect. There was not the slightest necessity to go out of town for architects and builders in the case of the erection of buildings. Mr. Owen said that no art had written its name so indelibly on the pages of history as architecture. That tradition rested with them to carry out in their simple way. It was not given to them all to do large work, but it was given to them to do sincere work. Mr. Garnett said he had many times read that the building trade employed the second largest number of people in its allied industries, but before he came into the room he had not quite realised what that meant. He thanked Mr. Davenport for his kind words with reference to his (the speaker's) profession. Mr. Warburton said he associated himself with the remarks which Mr. Silcock had made, more particularly with reference to the builders of the town. His short experience told him that they had every desire to do good and honest work, and that was very much appreciated by the architects. The toast of "The Corporation Official" was proposed by Mr. F. Warburton, and responded to by Mr. Longdin and Mr. Deas.

WIGAN AND DISTRICT ASSOCIATION.

Secretary: R. Hollows, A.C.A., etc.

In connection with the notice and counter notice of alterations to joiners' working rules in the Wigan district, further meetings of employers and operatives have been held, and the final meeting, at which terms could be arranged, was held on Thursday, March 4, the employers taking the stand that unless all points at issue could be settled, the whole of the points must go before the arbitrator for settlement. The operatives were against this, stating that if they could come to terms on several points, it was labouring the matter to have to start from the beginning again; but to this the employers would not agree, firmly standing by their first statement. Asked by the chairman (Mr. Johnson, J.P.) how they stood respecting the working hours and rate of wages, the men replied that they were of opinion that the time was now opportune for a reduction of hours to 49½ hours per week in the summer months, and to 44 hours per week in the winter months, and for an increase of pay to 9½d. per hour. In reply to the chairman, they stated that it was too much to expect a workman to sacrifice 3s. 9d. per week, through a reduction of hours, and that a rise of one halfpenny per hour on the 49½ hours would go towards making up the deficiency on the present week's pay. After private discussion, the operatives offered to come to terms on the basis that the wages stay at 9d. per hour until August next, after which they should be at the rate of 9½d. per hour. To this the employers would not agree, giving as their reason for objection that any increase in wages would have a deterrent effect on the public, preventing investment of money in property. The operatives thereupon offered to accept 9¼d. per hour and no less The employers stated that as far as they as a body were concerned the matter was at an end, as no increase in wages could be considered at the present time, and under the present condition of trade. Prior to further consideration, the operatives asked whether, if they accepted the 9d. per hour, the employers would agree to pay all overtime at the rate of one shilling per hour on all hours worked, each day's work standing by itself. To this the employers stated that they could not agree. On further private consultation, the operatives stated that they were willing to accept 9d. hour if they had allowed them the proposed hours of work in summer and winter months, and the alterations regarding overtime pay as set out in their notice to employers. The employers stated that they must have an allowance of at least six hours wherein overtime could be worked over the full working week at one penny per hour more than the standard rate of pay before the shilling rate of pay began to operate. To this the operatives stated that they could allow up to four hours at the extra penny rate, and after considerable parleying a compromise was arrived at by agreeing to five hours at the extra penny rate, before the shilling rate operated. The employers suggested an increase in the length of dates of winter months from November

1st to February 12th, as against the present dates of November 12th to February 2nd, to which the operatives agreed.

As regards the piecework and prepared woodwork rule, the chairman asked whether if the proposed new rule as demanded by the employers were allowed to drop, the operatives would undertake not to work for any person unless he was a bona-fide builder, and eligible for membership of this association. The operatives replied that the present prepared woodwork rule had worked well, and that they could not see that the extension of the boundary of five miles (within which all woodwork must now be prepared) to include any town in Lancashire, even where the wages paid at that town were on a par with the wages of this district, would benefit the trade of this district. The matter was not finally settled, when the meeting was adjourned until Monday, March 8th.

ORGANISATION.

Colne.

A meeting of the employers of Colne has been arranged for Wednesday evening, March 10th, when Mr. W. Bullen, of Liverpool, president of the Lancashire, Cheshire, and North Wales Federation, will attend and address the meeting on the importance of organisation.

Clitheroe.

Arrangements are being made to hold another meeting at Clitheroe, when it is hoped some progress will be made in the formation of an Association.

[When these associations are duly constituted, we shall be glad if the respective secretaries will at once communicate with the Editor of this journal.]

THE YORKSHIRE FEDERATION.

Secretary: J. DAVIDSON, 14, Park Row, Leeds.

The monthly meeting of the Executive Council of Yorkshire Federation was held at the Talbot Hotel, Kirkgate, Bradford, on Thursday, February 18th. Mr. W. R. Thompson (president) was in the chair, and 49 delegates were present from the affiliated associations. The minutes of last meeting were read and approved. The accounts, amounting to £50 2s. 10d., having been examined and certified as correct, were approved, and cheques were drawn in payment.

On the motion of Mr. A. W. Sinclair, seconded by Mr. T. A. Taylor, it was resolved, with respect to the question of cross-voting, to recommend the representatives of the Federation on the Conciliation Boards to urge the adoption of the amendment suggested by the employers when the proposal is being formally considered.

The president reported that the York case had been carefully and fully laid before the Executive Council and general meeting, with the result that the National Administrative Committee had been authorised to take action if necessary or expedient. On the motion of Mr. A. W. Sinclair, seconded by Mr. S. Coop, the Emergency Committee were instructed to obtain counsel's opinion as requested by the National Federation.

At the general meeting, the National Administrative Committee were requested to consider whether the National form of contract had worked satisfactorily or otherwise, and whether any amendments are necessary in the interest of builders. A letter was read from the National Secretary inviting the observations of the Federation on these points. Each local association was requested, on the motion of Mr. Harrison, seconded by Councillor England, to consider the matter at the next meeting, and forward their observations and recommendations to the Federation secretary before March 11th if possible.

It was stated that the Yorkshire Federation had been reported as in arrear with respect to reserve fund payments. On the motion of Mr. W. T. Ledgard, seconded by Mr. J. T. Levitt, the local associations were earnestly requested to give this fund their most urgent attention, and to contribute this year a sum at least equal to a levy of 3d. per cent. on wages.

It was reported that the Joint Committee provided under the agreement with the N.A.O.P. was now being constituted, and that a meeting would be called at an early date. A letter was read asking whether the Federation had any matters which they desire to place on the agenda for discussion at such meeting. On the motion of Mr. W. E. Biscomb, seconded by Mr. T. Lee, the matter was referred to the local associations for consideration and report to the Federation, for discussion at the next meeting.

Attention was drawn to the references in the King's Speech to the Housing and Town Planning Bill, and to the intention of the Government to bring in a Bill to establish Labour Exchanges and a Bill to establish Trade Boards in certain trades. A letter was read from the Employers' Parliamentary Council, stating that any Bills will be carefully watched with a view to appropriate action being taken. On the motion of Mr. W. T. Ledgard, seconded by Mr. A. W. Sinclair, it was resolved to request the Administrative Committee to urge strongly upon the Employers' Parliamentary Council the expediency of making representations to the Ministers having charge of the intended Bills, in order that they may understand and appreciate the interests of employers before committing themselves to a definite line of action or course of procedure. It was further resolved, on the motion of Mr. A. W. Sinclair, seconded by Councillor England, J.P., to request the National Administrative Committee to consider the advisability of immediate steps being taken by them to impress upon Ministers the value and importance of the great industrial safeguards afforded by the existing strong organisations of employers and workmen in the building trade, and of the incalculable trade and public benefit guaranteed by the mutual conciliation scheme, which might be seriously prejudiced if the trade can be brought within the scope of the contemplated Wages Boards by the decision and authority of a single Minister of the Government.

The minutes of the annual meeting of the Northern Centre and the January report of the Lancashire, Cheshire, and North Wales Federation, were read.

It was reported that the official visit of the members of the National Federation to the Building Trades Exhibition, to be held in London from April 17th to May 1st has been fixed for Tuesday, April 20th, at 5.30 p.m.

A letter was read from the York Association containing notices of alteration of rules, which had been formally given to the operatives. The object of the notices was to determine the walking area, and to define the boundary in which the working and conciliation rules apply.

A draft declaration as to freedom of workmen from physical or constitutional disability, to be signed on entering employment, was considered. On the motion of the president, seconded by Mr. J. Biggin, the form was remitted to the local associations, and they were requested to favour the Council with their views thereon at the earliest possible date.

One of the members called attention to a claim made upon him to restore certain asphalte work, which had been completed in accordance with the specifications three or four years ago. The sub-contractor who had carried out some of the work was not the one whose tender the principal contractor had based the tender upon, but one who had been substituted under the instructions of the architect. Some time ago, it was observed that the work was defective, and notice was given by the architect to the principal contractor to reinstate the work. Liability to do this was repudiated, and ultimately notice was given that a writ would be issued if the work was not reinstated, or its equivalent cost paid over in cash, within fourteen days. The contractor called in an expert to inspect the work, when it was found that the defect was absolutely attributable to constructional defects. The proprietors, having had the full facts laid before them, had written to the contractor suggesting that he should make an *ex gratia* contribution of £20 towards the cost of restoration, and if he accepted this suggestion they were prepared to give him a letter completely exonerating him from all blame and legal responsibility. It was reported that the member was considering this offer.

The president extended a cordial welcome to several members of the Barnoldswick Association who were present at the meeting. In responding, the Barnoldswick members drew attention to the serious and onerous nature of certain conditions included in the contract form issued by the West Riding County Council. The president stated that if the Federation were not favoured at an early date with the county architect's decision, a further interview would be sought, with a view to facilitating matters and obtaining more equitable conditions.

Councillor Mallinson, on behalf of the Huddersfield Association, invited the Federation to hold the next meeting in that town, and it was resolved, on the motion of Councillor England, J.P., seconded by Mr. A. Moulson, to hold the next meeting at Huddersfield, on Thursday, March 18th.

The representatives were entertained to tea by the president and members of the Bradford Association, to whom a hearty vote of thanks was accorded for their hospitality.—J. DAVIDSON.

LOCAL ASSOCIATIONS AFFILIATED TO THE YORKSHIRE FEDERATION.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

The monthly meeting of Barnsley Association was held at the King's Head Hotel, on Wednesday, February 10th, Councillor G. Haigh occupying the chair, and was supported by fourteen members. After the usual preliminary routine business, the main business of the evening was the proposed adoption of the inter-trading rule, on which there was an animated discussion. Correspondence was read from the secretary of the Sheffield Association, stating the beneficial results and the great increase in membership that had resulted from the adoption of the inter-trading rule, and Liverpool was cited as another instance of its successful adoption. The merits and demerits of the rule were debated at great length, and it was decided to leave the matter in the hands of the committee.

A committee meeting to consider and report on the inter-trading rule was held at the King's Head Hotel, on Wednesday, February 24th, Councillor G. Haigh, who occupied the chair, being supported by twelve members of the committee. The business of the committee meeting having been explained by the chairman, the matter was then thrown open for thorough discussion. The discussion ended with the adoption of a resolution to the effect that the Barnsley Branch should adhere to their old rule, which contains the indeterminate phrase, "where possible."

A very successful whist drive and social evening was held on February 18th, and was attended by about 140 members and friends.

THE NORTHERN COUNTIES FEDERATION.

Secretary: W. H. HOPE, Solicitor, Post Office Chambers, 14, Norfolk Street, Sunderland.

LOCAL ASSOCIATIONS AFFILIATED TO THE NORTHERN COUNTIES FEDERATION.

SOUTH SHIELDS.
Secretary J. G. Robertson.

The monthly meeting of the South Shields Association was held in the Victoria Hall on Tuesday night, March 2nd, Mr. T. Anderson presiding. There was a large attendance.

A long discussion ensued on the introduction by the secretary of the National paper's proposal *re* supply and training of apprentices, and much useful information was gained as a result.

On the question of the Sunderland and South Shields Water Company's attempt to enforce new by-laws, strong remarks were made by all as to the company's procedure. Instead of sending to our members written notices of the proposals, they had got their inspectors to go to builder after builder and give them oral instructions, asking the builders individually to take down the four proposed by-laws. On their coming to the secretary's office, he had absolutely refused, as had other members, to take them down, and asked the water company's inspectors to report that he wanted written or printed particulars. He wrote to the water company three times, even sending a registered letter, and at first no notice was taken of the letters, though afterwards they had been acknowledged. The secretary was congratulated on the stand he had taken, and the meeting expressed its determination to fight the matter out. The company are seeking chiefly to do away with all taps in yards.

The question of the corporation having on hand the amending of their by-laws to substitute w.c.'s instead of dry-earth closets was next under consideration. The members are certain that the main drains are not large enough for water carriage, and believe that if the scheme were adopted the resultant nuisance would be intolerable. It was felt that unless the main drains of the town were enlarged and relaid, the scheme would be impracticable; and a small committee was appointed to prepare a statement on the subject to submit to the council.

The members agreed to ask that the National form of contract should be altered as regards clause 32, so that clause 16 shall not be an excepted clause in same, and thus give the arbitrator more power without challenge to the powers of the arbitrator by reference to clause 16. They also wish to have added to same a clause to the effect "That the builders on the completion of the contract give up the plans, and architects give back to the builder his priced set of quantities."

THE MIDLAND CENTRE OF THE NATIONAL FEDERATION.

No meetings of the Midland Centre have been held since last report. The third annual conference of Midland Centre secretaries will be held at the Imperial Hotel, Temple Street, Birmingham, on Thursday, March 25th, at 3 p.m. The president of the Centre, Councillor H. Smith, West Bromwich), will take the chair, and Mr. A. G. White (National secretary) has promised to give an address. It is hoped that every secretary in the Centre will be able to attend.

Since the beginning of the year, the secretary has met at annual dinners the members of the following associations:—Mansfield, Burton-on-Trent, Leicester, Redditch, West Bromwich, Bromsgrove.—Very encouraging reports have been received as to the progress of organisation, and several associations, notably Mansfield, show substantial increases of membership. The Long Eaton Association has been re-organised, and Mr. C. Overmass has been appointed secretary; Mr. J. E. Jervis holding the office of honorary secretary.

Copies of the revised Midland Centre rules and of the National reports and minutes have been forwarded to the local associations for distribution among the members. Two or three copies of the report of conference of secretaries held in London on October 20th last have been sent to each association. Circular letters have been sent to the associations with regard to appointments to the Central Executive Council, the International Building Trades Exhibition to be held in London from April 17th to May 1st, and the proposed alterations to the National contract form. With regard to the last-named matter, several associations have expressed their approval of the form, and stated that no amendments are, in their opinion, necessary.—FRED. W. AMPHLET, secretary.

LOCAL ASSOCIATIONS AFFILIATED TO THE MIDLAND CENTRE.

BIRMINGHAM ASSOCIATION.
Secretary: E. J. Bigwood, J.P.

There was a good attendance at the meeting of the committee of the Birmingham Association, held at 17 and 19, Colmore Row, Birmingham, on Wednesday, February 10th, at 3 p.m., the president (Mr. F. G. Whittall) in the chair.

The minutes of the last meeting of the committee, which was held on January 18th, were read, confirmed, and signed, and the minutes of the conciliation meetings with the carpenters, bricklayers, masons, plasterers, and labourers, held on February 3rd and 4th, were read. These minutes were fully discussed, and the following resolution was unanimously passed:—"That the employers' notices of alterations to the working hours be strictly adhered to; the ordinary hours of work to be from 6.30 a.m. to 5 p.m., and overtime to commence after 5.30 p.m. for all trades." It was also resolved:—"That during the winter months the employer, if requested, should open the job at 7.30 a.m., and provide a man to light a fire to enable the operatives coming from a distance to have their breakfast on the job."

The question of "night shifts" was next discussed. Mr. Whittall reported that some of the operatives asked for payment at the rate of time and a third, and some at the rate of time and a half, for this work. It was proposed by Mr. Albert S. Smith, and resolved: "That, should night shifts be required, payment be made at the rate of time and a quarter for such work to all trades."

A letter was read from the secretary of the National Free Labour Association, asking for a donation to their funds. The secretary was instructed to reply that this association was not in a position to subscribe.

The secretary was instructed to issue a

ROOFING SLATES.
Velinheli, Penrhyn and Westmorland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

THE ASTON JUNCTION CO.
LTD.,
Aston Road, BIRMINGHAM.
BUILDERS' MERCHANTS
AND
SLATING CONTRACTORS.
CEMENTS, PLASTER, LATHS, LIME, QUARRIES, TILES, CHIMNEY POTS, SANITARY GOODS, FIRE BRICKS, and BLUE BRICKS of every description.
TELEGRAMS—"CONCRETE, BIRMINGHAM."
TELEPHONE NO.—1436, CENTRAL.

THATCHING AND
REED LAYING.
J. G. COWELL, SOHAM.

LAUNDRY
and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE.
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

HOLLIS BROTHERS
& CO.,
Timber Importers.
HULL. Jameson Chambers.
LEICESTER. Queen Street.
Wood Block Flooring.
H. B. Hardwood,
Floorings,
Oak, Maple, etc.
Large Stocks of Joinery Wood held under cover.
Mouldings, etc., to design.

Telephone: No. 82 CENTRAL (2 Lines.)
Telegrams: "ELF, BIRMINGHAM."
SUTTON & ASH,
41, SNOW HILL, BIRMINGHAM.
JOISTS CHANNELS,
ANGLES, TEES,
RIVETTED GIRDERS,
LIGHT ROOFS &c

circular to each member of the association expressing the hope that they would loyally adhere to the new rules, and asking each member for the names and addresses of the merchants, manufacturers, and sub-contractors with whom they do business, to enable him to endeavour to secure them as members of the association.

Messrs. J. B. Whitehouse and Ralph Webb were re-elected as the representatives of this association on the Executive Council of the Midland Centre of the National Federation.

REDDITCH ASSOCIATION.

Secretary: H. Huins.

As reported in last week's issue, the third annual dinner in connection with the Redditch Master Builders' Association was held at the Unicorn Hotel, Redditch, on Thursday, February 18th, the President (Mr. F. C. Huins) in the chair. A few additional particulars are now given.

Proposing the toast of "The Redditch Master Builders' Association," Alderman G. W. Hobson said he was glad to hear that the Association was in a flourishing condition, and that, with one exception, they had "roped in" every master builder in the town and district. He was also pleased to know that in connection with the Association there was a local committee, or board of conciliation. If any differences should arise between employers and employees the Association would do what it could to arrange a meeting with the representatives of the various trade unions, so that the difficulties could be discussed in a friendly way across the table, and perhaps, with the aid of a little tobacco, satisfactorily settled.

Responding to the toast, the President said he thought they had got to the rock-bottom of the period of trade depression, and there were signs of improvement close at hand. He mentioned that the firm that was still outside the Association had promised to join, and then they would have the whole of the builders of the district members of the Association.

Mr. J. Gross proposed "The Town and Trade of Redditch." The Council he said, were borrowing £15,000 for a new sewerage scheme. With respect to the electric light undertaking, he remarked that it had never paid, and he understood the position was worse this year than ever. Two reasons were assigned for this—because the price of the current had been lowered, and because of the introduction of the Osram lamp, which consumed less current, so that the consumer had less to pay.—In responding to the toast, Mr. T. Huins expressed his confidence that the staple trades were about to expand, when the building trade would see better and brighter days.

Mr. Huxley submitted the health of "The Visitors," and Mr. J. Brazier replied. The toast was also acknowledged by Mr. Grant, who said he was sorry to hear that the building construction class at Redditch was poorly attended. His firm insisted on the apprentices attending such classes, or they would not employ them.

Proposing the health of "The President and Vice-Presidents," Mr. F. Amphlet said he did not think he need impress upon them as builders the fact that they were not only members of a local association, but that they formed important units in the great organisation that covered the whole of the country. In the Midland centre they had some 24 Master Builders' Associations, and he was pleased to tell them that despite the depression in trade the organisation as a whole was in a very healthy condition. The Birmingham Association had adopted the inter-trading rule, and he had no doubt that in a few years' time the membership of the Birmingham Association would increase from 100 to 200 or 300. As to the work of the centre, Mr. Amphlet said last year they renewed the arrangement previously made for the insurance of their members against workmen's compensation risks. They were able to obtain terms by bargaining collectively with the insurance company that no builder could obtain individually. Not only could they get their insurance effected at a lower rate than in any other office, but they had the additional advantage of their policies being free from restrictions, and covering all risks. The Federation had made an arrangement with the "Builders' Journal" for that paper—which he thought he might safely say was the best trade journal in the country—to be the official organ of the Federation. Mr. Amphlet referred to the success achieved by various conciliation boards in settling disputes, and said he regarded membership of the Federation as a kind of insurance.

The health of "The Secretary" was heartily drunk, on the proposition of Mr. Newbould, who said the success of the Association reflected great credit on Mr. H. Huins, who had carried out his duties in a very able manner. In reply, Mr. H. Huins said it was with the greatest regret that he had to give up the position. It had been a labour of love, and in the discharge of his duties he had received the greatest assistance of the members. The Association was something more than a name. It had justified its existence, and as time went on it would become a very important and useful body.

THE EASTERN COUNTIES FEDERATION.

LOCAL ASSOCIATIONS AFFILIATED TO THE EASTERN COUNTIES FEDERATION.

CAMBRIDGE ASSOCIATION.

Secretary: C. F. Charlton.

The annual dinner of the Cambridge Association was held at the University Arms Hotel, Cambridge, on Thursday, March 4th, 1909. The president (Mr. Alderman J. Bell, J.P.) was in the chair, and was supported by the Mayor of Cambridge (Mr. Alderman W. P. Spalding, J.P.), Mr. A. G. White (secretary of the National Federation of Building Trades Employers of Great Britain and Ireland), the Borough Surveyor (Mr. J. Julian), the Solicitor to the Asssociation (Mr. A. J. Lyon), Mr. John Morley and Mr. Paul A. Macalister (architects of Cambridge), Mr. O. Papworth, Mr. A. Mason, Mr. W. W. Gray, Mr. Brereton Wright, Mr. Wm. Dawson, Mr. W. H. Jarrold, Mr. C. F. Charlton (secretary), and others, the number present being 26. After the usual loyal toasts, the toast of the National Federation of Building Trades Employers of Great Britain and Ireland was submitted by Mr. Wm. Lofts, of the firm of Messrs. Coulson and Lofts, and responded to by Mr. A. G. White, the secretary, who, having so little time at his disposal, owing to being obliged to return to London the same night, was only able to give a brief outline of the various matters connected with the Federation. The members were delighted with the presence of Mr. White, and regretted he was not more fully able to go into matters affecting the building trade generally. Mr. Councillor Sindall proposed the "Town of Cambridge," which was responded to by the Mayor. "The Architects" was proposed by Mr. C. Kerridge and responded to by Mr. John Morley and Mr. P. A. Macalister. "The Building Trade" was proposed by Mr. A. J. Lyon, and responded to by Mr. Saint. "The Visitors" was proposed by Mr. G. R. Kett, of the firm of Messrs. Rattee and Kett, and responded to by the Borough Surveyor, Mr. A. Mason, and Mr. O. Papworth. "The Chairman" was proposed by Mr. E. Willmott, of the firm of Messrs. Willmott and Sons, and responded to by the chairman.

LONDON
JAMES BROWN (LONDON), LTD.,
MAKE THE BEST
HOLLOW POROUS BRICK PARTITIONS
In 1½ in., 2½ in., 3 in. and 4 in. thicknesses.
Takes a Nail Perfectly
ESSEX WHARF, WHITECHAPEL, E.
—— Telephone, 9513 Central. ——

Telephone, No. 1062 HOLBORN.
Contractors to H.M. Government, &c.
THE PERFECT TILE CO.,
13 & 15, Featherstone Buildings,
Holborn, LONDON, W.C.
OPAL WALL TILES. GLAZED WALL TILES.
Tessellated and other Floor Tiles.
Terrazzo and Cube Mosaics to any Design.
Fireproof Partitions. Fireproof Jointless Floors
AGENT FOR "MODERNIA" GLASS TILES

BUILDING . BOOKS . AT
GREAT REDUCTIONS ! !
New Books at 25 per cent. Discount.
Books on Building, Architecture, Surveying, Estimating Technical, all other Subjects and for all Examinations Supplied. Sent on Approval. State Wants. Catalogues Free.
BOOKS PURCHASED.
R. P. FOYLE, 135, Charing Cross Road, London, W.C.

Send for Prices and Particulars of
FRAZZI FIREPROOF
FLOORS & PARTITIONS.
Frazzi Fireproof Construction, Ltd.,
Essex Wharf, Durward Street,
WHITECHAPEL.

BIRKBECK BANK.
Established 1851.
Southampton Buildings, High Holborn, W.C.
2½ PER CENT. INTEREST
allowed on Deposit Accounts.
2 PER CENT. INTEREST
on Drawing Accounts with Cheque Book.
All general Banking Business transacted.
ALMANACK with full particulars, POST FREE
C. F. RAVENSCROFT, Secretary.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs,
Premier Ironworks,
DEPTFORD, S.E.

Sprague Electric
ELEVATORS.
SPRAGUE ELEVATOR CO. LTD.,
QUEEN ANNE'S CHAMBERS,
WESTMINSTER,
LONDON, S.W.

Federation Topics.

HOARDING & FENCING CASE.

In the Sheffield Second Police-court, on March 3rd, James Martin, of 4, Club Street, Sharrow, a partner in the firm of Martin and Hughes, builders, appeared before the magistrates in response to two summonses, one under the Public Health Amendment Act (Section 34), the other under the Corporation by-laws. Mr. H. L. Coath, who prosecuted, said that defendant's firm were erecting six houses in Westwood Road, Nether Green. The street ended in a *cul de sac*. There were ten houses already erected at the far end of the street, and nine of these were at present occupied. The street had been open to the public since 1904, and was railed off by railings placed at the expense of the Corporation on one side. It appeared that the defendant, or his firm, had deposited plans in November last for the building of these houses, and the houses were in course of erection. The magistrates would be told that in building these houses the defendant had turned the street into a perfect building yard. He had in it sheds, building implements, loads of bricks, lime, and all sorts of materials.—Mr. Coath brought witnesses to show that the place was not properly fenced and lighted, and the residents living beyond the houses in course of erection were in danger of injuring themselves at night time.—Mr. A. Neal (appearing on behalf of the Master Builders' Association), to Mr. Duffey (Corporation Building Inspector): Is not this the same kind of fence that has been used from time immemorial for such buildings? Has this case been before the Suburban Highways, or is it a pure police prosecution?—Witness: It is a Corporation prosecution.—Mr. Neal: By whose authority? Has it been before the Highway Committee? Has it been before the suburban highways? You are not going to suggest that in every suburban building there must be closed hoarding?—Witness replied in the affirmative, and added that the policy was not a new one.—Mr. Neal: Do the Corporation adopt it in their own buildings?—Witness: Yes.—Mr. Neal remarked that this was a new departure, and it was disadvantageous for all building parties concerned. In this case the course adopted had been exactly the same as that followed in Sheffield within the memory of the oldest member of the building trade. The building material was put down and then fenced all round.—In answer to Mr. Coath, Mr. Duffey stated that for about forty-five yards the fencing was not lighted at night.—Mr. John Biggin, of Messrs. Biggin, Ash, and Son, one of the oldest builders in the city, said that the fence round the property was a good one. He had never known a case before in which the Corporation had asked for a hoarding to be placed between the building line and the footpath.—The Bench considered that the fence was sufficient for the purpose, and that it was sufficiently lighted. With regard to the charge relative to the hoarding, they imposed a fine of 10s.—In somewhat similar cases, heard at the same time and place, James Masson and Samuel Hancock were each fined 10s. for committing a breach of section 34 of the Public Health Amendment Act.

Commenting on the above cases, Mr. Thos. Smith, secretary of the Sheffield Master Builders' Association, writes as follows:—It has been an established practice in Sheffield from time immemorial not to erect close-boarded hoarding in such positions as those in respect of which the summonses were issued—viz., remote suburban *cul de sac* streets in which there is practically no traffic, and, indeed, with the tacit consent of the City Council, no hoardings whatever have been erected in many cases, and what is more, the Corporation itself in its own contracts has not provided close-boarded hoardings, nor do its by-laws require other than *sufficient* hoarding for the proper protection of the public. The two latter summonses were taken out under the Town Police Clauses Act.

As the subject of the summonses marked an important departure from established precedent, the matter was brought to the notice of the Master Builders' Association, who promptly decided to defend the cases in the interests of its members, and the matter was put in the hands of a local solicitor.

At the last moment the defects in the information on the summonses were discovered by the Police or Corporation, and the cases were allowed to be taken, not exclusively on the by-laws and Town Police Clauses Act, but under section 34 of the Public Health Amendment Act of 1890, and this move on the part of the prosecution saved the situation, though even then the case is not without its anomalies. It is inconceivable, however, why this section, which is adoptive, and which presumably has been adopted by the City Council, was not cited on the summonses in the first instance. The section referred to provides that "Every person intending to build or take down any building, or to alter or repair the outward part of any building in any street or court, shall (a) before beginning the same, unless the Urban Authority otherwise consent in writing, cause close-boarded hoards or fences to the satisfaction of the Urban Authority to be put up in order to separate the building from the street or court." So far, so good. But like all Acts of Parliament, through which the proverbial carriage and horses can be driven, the exact meaning of the requirements of this section is somewhat obscured for the want of punctuation. A comma after "close-boarded hoards," would have settled the technical inference one is entitled to draw from the wording of the section. "Hoard" has the misfortune to be a term which is not specifically defined in the Public Health Act, 1875, and one must perforce fall back on the common dictionary meaning, with the inevitable result that "hoard" as applied to an erection has only one meaning, viz., "a fence enclosing a house and materials while builders are at work." From the same authority one learns that a fence is a wall, hedge, or *line of posts and rails*, and the part of the definition italicized is the commonly accepted definition. From all this one arrives at the somewhat paradoxical conclusion that while a hoard is a *builders'* fence, a fence is not necessarily a hoard, and it is a moot point as to whether the compound adjective "close-boarded" was intended by the framers of the Act to govern "fence" as well as "hoard," as it is obvious that if a *builders'* fence were close-boarded it would cease to be a fence, and *ipso facto* become a hoard. It is then clear that a *builders'* fence cannot be close-boarded, hence the adjective cannot apply to the fence (Q.E.D.). But this technial point was not pursued.

Another interesting point in the case was that the defendants Martin and Hughes had merely continued an existing fence of posts and rails previously erected by the defendant Belton, who at Easter, 1908, was summoned for placing materials on the street without a fence at all, as has been done and is being done at the present time in other places. When the case came before the Court, the defendant Belton was asked if he had erected a fence since the summons had been taken out. He replied that he had, and the police-constable who laid the information corroborated, and said that the fence was satisfactory. And yet Belton was now summoned for the self-same quondam satisfactory fence being unsatisfactory, but as in the present case the fence had been removed since the summons was taken out, in consequence of the houses being completed. The case was evidently too flimsy for the prosecution to pursue, and the summons was unconditionally withdrawn.

A perhaps still more interesting point which was not brought out in cross-examination was that one of the witnesses for the Corporation in his evidence claimed that the Corporation did cause to be erected close-boarded hoardings on their own works, and cited as an instance the case of a lodge now in course of erection at Whiteley Wood, only a few minutes' walk from the buildings in respect of which the summonses were issued. But it could be shown that this close-boarded hoarding has only been erected within the last fortnight or so, and that while the cellars have been dug and the foundations laid, the works have been innocent of fencing.

The result of the decision seems to be paradoxical. The fence is both sufficient and insufficient. It remains for the Master Builders' Association to approach the Highways Committee in order to ascertain what precisely is required.

THE ANOMALIES OF "WALKING TIME."

The question of walking time is an old one, for which provision is made in the rules of several operatives' societies, and while in some rural districts it may still have a *raison d'être*, its operation in large centres of population, with modern facilities in the shape of trams and trains, has rendered its provisions more or less nugatory.

At Sheffield the matter has become acute, and on Friday, March 5th, a meeting was held at the Builders' Exchange to consider the advisability of abolishing altogether the rules in regard to walking time. Mr. A. J. Forsdike, the president of the Local Conciliation Board, presided, and there were also present representing the employers:—Messrs. W. W. Mears (president of the Sheffield M.B.A.), J. Biggin, Thos. Roper, W. Longden, T Eshelby, F. Fider, J. D. Cook, and T. Smith (secretary).

The employees were represented as follows:—Amalgamated Society of Carpenters and Joiners, Messrs. Thos. Wood, W. Lane; General Union of Carpenters and Joiners, Messrs. J. H. Blincow, F. H. Kent; Bricklayers (London Order), Messrs. J. L. Evans, R. H. Stanton; Bricklayers (Manchester Order), Messrs. H. A. Stone, F. Limage.

The Chairman, in opening the proceedings, gave a hearty welcome to the operatives' representatives, and mentioned that the meeting was purely and simply a meeting of Trades Committees under section 2 of the rules of the Conciliation Board, hence only the joiners and bricklayers were represented. They were met to consider the advisability or otherwise of doing away with Rule 7 of the Operative Bricklayers, and Rule 5 of the Operative Carpenters and Joiners. Walking time, he thought, was out of date. They would remember that when six years ago they had a long discussion, the result of which was that the boundaries for walking time were extended from 1½ to 2½ miles from the parish church, that the employers were of opinion that walking time should be abolished altogether. As they knew, the rule had not been working very satisfactorily, and there had been some difficulty in one or two cases quite recently, and the rule was not rigidly observed on many jobs, the operatives themselves being as much a party to its being broken as the employers. As employers they relied on the operatives' societies to call their attention to any infringement of rules, but as attention had only been called to the question on certain specific cases on Corporation or Education Committee jobs, they were entitled to conclude that the existing arrangement was perfectly satisfactory. As employers they wished to have rules which they could consistently carry out. The walking time rule, if rigidly adhered to, would increase the cost of work, and, especially in such times of bad trade as at present, one of the greatest problems that employers had to consider was how to get work done at the price they had for it. It was the duty of the workmen to see that they got as high remuneration for their labour as possible, but that view should not be taken to the exclusion of all others. They must also regard the position from a commercial point of view; and sooner or later they would be forced to consider how to get work done for less money than at present. During the past ten years the cost of labour on building operations had gone up enormously, but there had not been a corresponding increase in the cost of materials, which, as a matter of fact, were cheaper than ten years ago. With these points he was sure the operatives would see that there was some ground for the suggestion the employers were putting forward. When trade was good wages had gone up, and now that trade was bad wages had not gone done. In Sheffield and throughout Yorkshire though the matter had been discussed on several occasions, they had rigidly set their faces against lower wages. They considered that wages were low enough for the men who were prepared to do a fair day's work, and rather than lower the wages they preferred to assist in lifting the stamina of the men and getting them to realise that unless they earned their wages they could not have them for long. As builders they could not afford to be philanthropists; they must make business pay, or stand down and let someone else take their place. He wished the operatives to consider the position from a friendly and commercial standpoint, and not simply take up the position that because something had existed it must necessarily go on. In other words, they wanted the operatives to look at the matter not only from their own standpoint but also that of the builder. The facilities for getting about were very much greater than they were at the time the walking rule was instituted, and it now seemed arbitrary that if a man lived, from choice, outside the boundary, and availed himself of these facilities, there should be any talk about walking time as compared with the man who chose to live nearer the job. There had been a system in vogue for many years that when workmen were engaged and paid on the job, it was not customary to pay walking time, and that was another reason why the rule should be altered. If the Sheffield employers were compelled to pay walking time on jobs outside the boundary, the outside contractor was able to come in, put down his plant on exactly the same ground, and the conditions did not apply, and the Sheffield contractor had therefore not a fair chance, and to equalise matters they considered that a Sheffield contractor who erected his plant and branch office on the same ground should have the same privileges. The employers brought forward the matter, he assured them, not in any carping or arbitrary spirit, but as a matter of sheer necessity which demanded attention.

Mr. J. Biggin said that this matter of walking time was reaching an acute stage all over the country, and in Leeds and Huddersfield, the former of which might be taken as the fairest criterion of the conditions in Sheffield, the rule in regard to walking time was "that the question of walking time, lodgings, and railway fares, be matters for arrangement between employers and their men." What they wanted was something of the same kind at Sheffield, *i.e.*, something which would work amicably between them.

Mr. Evans asked what the masters were prepared to give in lieu of walking time if the operatives agreed to give it up.

Mr. Biggin, in reply, said that the question of lowering wages had been pressed on their notice on several occasions, but they had always objected, and this, he held, was a substantial set-off.

Mr. Wood gathered that the intention of the employers was to do away with walking time altogether, to which

The Chairman replied in the affirmative, but intimated that they were prepared to listen to any argument which could be advanced for the retention of the rules referred to.

Mr. Wood, continuing, said the rule was honoured by age, and he proceeded to trace the alterations in the rule from 1875, when the walking time was fixed for a distance of one mile from the shop through various gradations, entailed by altered conditions, until it arrived at its present stage some six years ago, and arguing from this he asked if it would not be as well to let the rule stand and consider such an extension of radius as the altered conditions seemed to warrant. If they approached their respective societies with a proposal for abolition, they would at once ask what they were to have in return.

Mr. Roper said the masons at Sheffield had not, and did not want, walking time, to which

Mr. Stone replied that he did not wish it to be inferred that the bricklayers were to be ruled by the masons.

Mr. Lane inquired if the Master Builders' Association contemplated any action which would contravene rule 9 in regard to notice of alteration of rules being given, to which

The Chairman replied in the negative.

Mr. Wood assumed that if the operatives did not take some action in the matter as a result of the meeting, the Master Builders' Association would eventually give notice for abolition of the rule in the ordinary way, and on receiving the chairman's reply that this course would most likely be taken, he remarked somewhat nonchalantly that the only argument he could offer at the moment was that they must stick to the rules as they existed.

Mr. Stone quoted an instance in which an outside contractor was not paying walking time, but as a result of their negotiations the contractor eventually paid it, but

Mr. Evans promptly rejoined that the contractor in question was paying 10d. per hour, and they (the Operatives' Society) gave way ½d. per hour. in order to get 10 minutes' walking time.

The Chairman remarked that the Master Builders' Association assisted in the settlement, and eventually the contractor became a member of the association.

Mr. Lane said that for the better facilities for getting to the suburbs, to which the Chairman had referred, the workmen had to pay, but

The Chairman replied that the workmen would avail themselves of the facilities which the trams offered whether they were paid for walking time or not, and as a matter of fact the abolishing of walking time did not affect wages at all: it simply meant that the workmen would receive wages for 10, 15, or 30 minutes' work instead of the same time in walking, and this amount, while small individually, worked out in the aggregate to a sum which put the Sheffield contractor at a great disadvantage with the outside contractor, who could come and put his plant and branch office down on precisely the same ground, and would not be subject to this infliction. He could, therefore, cut out the local contractor, which was mutually to the disadvantage of both the local employer and employee. He wished to assure them that the employers were not attempting to "best" the operatives in any way, but they were forced either to cheapen building costs or lose contracts, and they much preferred the proposal outlined to that of lowering wages. In conclusion the Chairman referred to work on which his firm had been engaged for some considerable time outside the Sheffield boundary, where wages were ½d per hour less, but still they had paid the Sheffield rate, and they had not been asked to pay walking time.

The discussion went on in desultory fashion for nearly three hours, the Chairman incidentally remarking that 75 per cent. of the jobs in Sheffield had been taken latterly at profitless, or practically profitless, prices, while in some cases there must inevitably be a loss.

Eventually the matter resolved itself into what the delegates present could offer to their members in lieu of walking time, but in reply the Chairman said that this matter had not been taken into consideration, as it was felt that the altered conditions of trade demanded the change, and he hoped the delegates present would present the matter to the respective societies in the same frank, fair, and friendly manner in which it had been discussed.

At the request of the delegates present, the secretary was instructed to communicate in writing to the secretary of each society represented the proposal as outlined.

The meeting terminated with a hearty vote of thanks to the Chairman, proposed by Mr. Wood, and seconded by Mr. Biggin.

THE USES OF ADVERTISEMENT.

Mr. Henry Labouchere has a long article in "Truth," on the Territorial Army, in which he pays a well deserved tribute to the "Daily Mail" for the effort they recently made to secure the needful complement of recruits in the London district, and remarks on the value of advertisement in the Press as a means of securing anything that is wanted. He quotes Lord Esher, and says:—

"That he and his colleagues have been criticised and mocked at for appealing for soldiers through the Press, and that to this they remain profoundly indifferent, on the principle that they laugh who win. This is the only sensible view to take. Why on earth anyone should criticise or sneer at an appeal for soldiers through the Press I am at loss to conceive. *It is the simplest and most expeditious way of getting anything you want in these days. Modern conditions of national life demand enterprise aud advertisement.* Every business man knows and recognises this truth, and if our Army is to be run on businesslike lines it must be recognised there, too."

The words we have italicized seem especially applicable to the building trade because there is probably less use made of advertisement by employers in that industry than in other important industry in this country.

Admittedly building trade employers want business badly. Then why not advertise for what is wanted?

Let the building trade convince the public that this is the time to build, that prices are low, and show them that investments in real estate will pay. Let them note that many small buildings will be required in connection with the operation of the Small Holdings Act and lay themselves out to supply the right kind of cheap buildings. Let them keep their names before architects and clients by attractive and pithy advertisements of their qualifications. This is the way to stimulate and foster a revival of their industry.

List of Official Appointments Vacant.

Assistant Overseer and Collector of Rates (Northfield, March 15).—Salary £500.—E. Docker, clerk to the Council, 10, Newhall Street, Birmingham.

Electrical Engineer (Mysore, India, May 15).—Salary Rs. 1,500 (£100) per mensem.—W. McHutchin, secretary to the Government of Mysore Public Works Department, Bangalore.

General Foreman (Coventry, March 15).—Salary £3 3s. per week. Age between 30 and 45 years. —J. E. Swindlehurst, city engineer and surveyor, Saint Mary's Hill, Coventry.

Buildings Foreman (Coventry, March 15).—Salary £2 10s. per week. Age between 30 and 45 yrs.—J. E. Swindlehurst, city engineer and surveyor, Saint Mary's Hall, Coventry.

Railway Engineer (Barrow-in-Furness, March 12). —Salary £800 per annum. Age not to exceed 50 years.—The Secretary, Furness Railway Co., Barrow-in-Furness.

Road Foreman (Walton-on-Thames, March 13).—Salary 30s. per week. Age not to exceed 45 years. —R. Wilds, surveyor, Council Offices, Walton-on-Thames.

Secretary to Southampton Gas Light and Coke Co. (Southampton, March 17).—Salary £500 per annum. No application from anyone not experienced in such office.—F. Lewis, acting secretary, Ogle Road, Southampton.

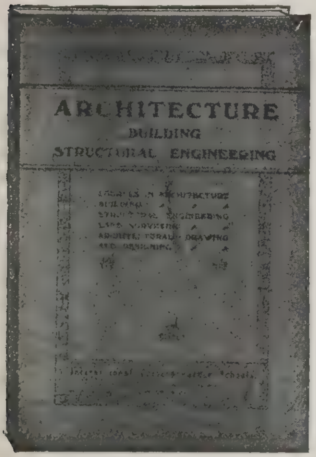
Surveyor and Sanitary Inspector (Ludlow, March 15).—Salary £200 per annum. Age not to exceed 40 years.—A. W. Weyman, clerk to the Council, Ludlow.

Assistant Surveyor (Woodford, March 20).—Salary £130 per annum.—J. A. Simpson, clerk to the Council, Council Offices, Woodford Green.

FIVE YEARS AGO THESE TWO MEN STARTED LEVEL

—one is still at his bench, toiling hard and long for a slender pittance—the other now occupies a high-grade position in his profession, enjoying high pay, congenial work, influence and power. What is the reason of the present difference in their fortunes? It is not that the successful man has more brains than his "stand-still" colleague of five years ago—**but he does know better how to use them.** In a word, he has **trained** his brains on practical remunerative lines, while the man still at the bench has not.

This instance is just typical of thousands we could cite in which men have devoted a few months to serious home study with the International Correspondence Schools, and, as a direct consequence, have secured a future of success and happiness, while their less ambitious colleagues have condemned themselves to a monotonous continuance of the old round of drudgery.



Free Books on Subjects Below

What about Yourself Five Years from now?

You must be ambitious or you would not have read thus far. Determine then to realise your ambition—to rise out of the rut—by enrolling right away for a course of specialised training with the International Correspondence Schools. Spare time home study only is required. You make the fullest use of your leisure, wasting no time travelling to and from classes. You make every hour you give to study count in your career, for the I.C.S. course arranged for you will have the one and only aim of preparing you for the high grade position to which you aspire.

The evidence of the thousands of students who have benefited by our training during the past 17 years is conclusive on this point. This is how one of them puts it

Aston, Birmingham.

"There is no doubt that yours is in reality 'the system that raises salaries,' that raises a man who doesn't mind work to the highest eminence in his trade."

(Signed) A. H. Du Rose.

Mark the Coupon below, or write us about any other career. Don't delay! Think of the significance to your future of your present choice and

TAKE THE WISE STEP TO-DAY

81

Manager, INTERNATIONAL CORRESPONDENCE SCHOOLS, Ltd.,
(Dept. B), International Buildings, Kingsway, London, W.C.
And at Manchester, Birmingham and Glasgow.

I am interested in your System of Technical Training and desire to increase my earning power. Please send me, post paid, free of charge, the Book covering the subject before which I have marked X on the Coupon, and full information showing how I can succeed in same.

Mechanical Engineering.
Architecture.
Electrical Engineering.
Structural Engineering.
Gas Engineering.
Machine Shop Practice.
Sanitary Engineering.
Textiles.
Civil Engineering.
Analytical Chemistry.
Mining Engineering.
Steam Engineering.

PREPARATION FOR EXAMINATIONS.

Name..

Street..

Town ....Occupation..................................

Residents of the following Countries should address the respective I.C.S. Branches:—

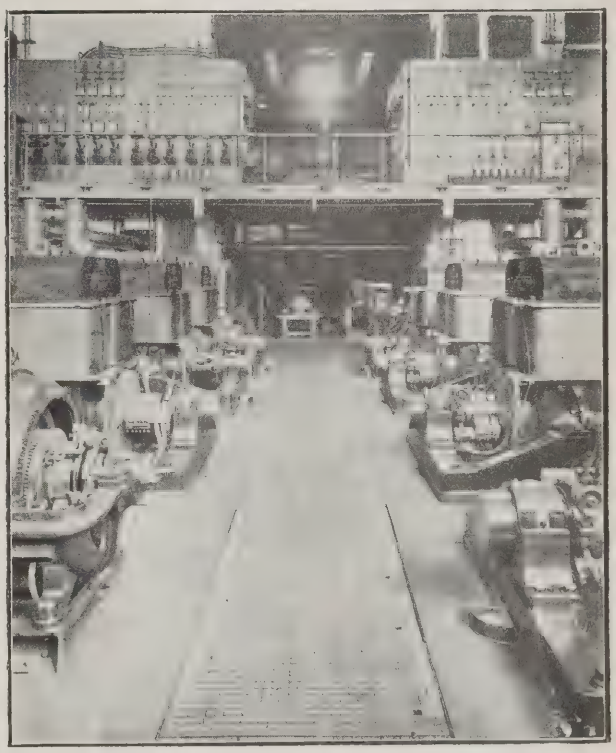
CANADA—Toronto.
INDIA—Fort Bombay.
SOUTH AFRICA—Cape Town.
NEW ZEALAND—Wellington.
AUSTRALIA—Sydney.
ITALY—Salerno.
CHINA—Shanghai.
MANILA—Manila, P.I.
HONOLULU—Honolulu.
PANAMA—Ancon.
BERMUDA—Hamilton.
STRAITS SETTLEMENTS—Singapore.
PORTO RICO—San Juan.
JAMAICA—Kingston.
MEXICO—Mexico D F.
ARGENTINE REPUBLIC—Buenos Aires.

The Renowned
Andrews-Hawksley
Patent Tread

Applied to Wood, Iron, Stone or Concrete Stairways, Floors, Landings, Platforms, Non-Conducting Floor Plates for Electric Light and Power Stations, Pavement Covers, etc., etc.

Pioneers of all Stair Treads.
The Tread that has lasted a lifetime.
There is nothing to equal it in the Market.

Quotations given for Concrete Steps fitted complete with our Treads.



MILLBANK GENERATING STATION, WESTMINSTER.
(Under C. Stanley Peach, Esq., F.R.I.B.A.)

Used by Great Western Railway, London and North Western Railway, London Brighton and South Coast Railway, Great Northern Railway, Midland Railway, North Eastern Railway, North British Railway, Lancashire and Yorkshire Railway, etc.

Specialists in Light Constructional Work in Iron or Steel; Special Work in Wrought or Cast Iron; Staircases of every description; Concrete and Granolithic Work, etc.

THE ANDREWS-HAWKSLEY PATENT TREAD & ENGINEERING COMPANY,
Columbia Works, Prestons Road,
POPLAR, LONDON, E.

Telephone No 700 Eastern.
Telegrams: "Uniflorous London."

Publisher's Notices.

Offices: Advertisement, Editorial and Counting House—Caxton House, Westminster. Publishing—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address: "Buildable, London."

Telephones: Advertisement, Editorial and Counting House—817 Gerrard. Publishing—2200 Holborn (six lines).

Date of Publication:—The Builders' Journal and Architectural Engineer is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted.

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, Builders' Journal, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bourne, Lincs.—For erection of five cottages in West Street, Bourne:—

Rallinson Bros., Bourne and Morton...	£800
S. C. Smith, Deeping	800
Watson and Co., Double Street, Spalding	662
J. H. Roberts,* North Street, Bourne	640

*Accepted.

Blyth, Northumberland.—For additions to Crofton Schools, for Blyth Education Committee. R. Grieves, surveyor:—

Swann Brs., Blyth	£967	18	6
R. Baxter, Blyth	860	0	0
Cook Bros., Blyth	801	11	2
Robson and Waddle, Blyth ...	798	10	0
J. and W. Simpson,* Blyth ...	759	16	0

*Accepted.

Colchester.—For the erection of superstructure of main building of new asylum, Colchester. F. Whitmore and W. H. Town, A.R.I.B.A., architects, Colchester. Messrs. R. L. Curtis and Sons, quantity surveyors, London:—

McCormick and Sons, Northampton Street, N.	£212,632
F. Bennett, Ipswich	203,600
Perry and Co., Bow	201,079
Pattinson and Sons, Parliament Street, S.W.	199,832
T. Rowbottom, Birmingham ...	196,392
Allen and Sons, Kilburn	195,590
H. Lovatt, Wolverhampton	195,186
Arnold and Son, Doncaster ...	192,500
J. Byrom, Ltd., Bury, Lancs ...	191,687
Waring and White, Ltd., Cockspur Street, S.W.	191,139
Leslie and Co., Kensington Square, W.	190,405
A. J. Bateman, Ramsey, Hants ...	189,889
W. King and Son,* Westminster, S.W.	189,691

*Recommended for acceptance.

Cymmer, Wales.—For the following works:—(1) Excavations for the foundations, building in masonry, abutments, and other works in connection with the bridge; (2) excavations, etc., building a retaining wall, together with constructing a urinal; (3) construction, delivery, and erection of a steel girder bridge over River Avon at Cymmer, for the Glyncorrwg Urban District Council. Mr. W. P. Jones, surveyor:—

Evans Bros.	£2,555
W. Williams	2,300
B. Chaplin	2,202
D. Rees, Treorchy	2,088
Finch and Co., Chepstow	2,085
G. Palmer, Neath	2,032
Collins and Co., Barry	2,019
R. Pomeroy and Co.	2,008
T. Scott, Port Talbot	2,000
G. Morgan, Pontypridd	1,999
G. Thompson and Co.,* Birmingham	1,771
T. Walker, Clydach (masonry only)	1,578
Somerville and Co., Glasgow (steel only)	661
Bulthell and Co., Worcester (steel only)	645
A. Dawney and Co. (steel only) ...	591

Engineer's estimate, £2,025.

Rest of Cardiff.

*Accepted

Hailsham, Sussex.—For erection of premises, for the London and County Banking Company, Ltd., and offices for Messrs. A. Burtenshaw and Son. Mr. Arthur H. Burtenshaw, P.A.S.I., architect, 7, Bolton Road, Eastbourne:—

M. Martin and Sons	£1,775
Peerless, Dennis and Co.	1,768
J. Bodle	1,733
A. Chilton	1,648
T. Rich	1,583
J. Martin	1,549
A. G. Phillips*	1,390

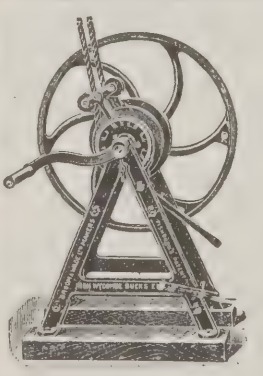
*Accepted.

Huddersfield.—For erection of the Palace Theatre, Kirkgate, Huddersfield. Messrs. R. Horsfall and Son, architects, 22a, Commercial Street, Halifax:—

Law, Stead and Sons, Huddersfield...	£13,173
T. Pickles, Luddendenfoot	12,950
J. Parkinson and Sons, Blackpool...	12,763
W. Wade and Co., Leeds	12,400
Graham and Jessop, Huddersfield...	11,940
J. Radcliffe and Sons, Huddersfield	11,771
T. Bottomley and Son, Huddersfield	11,693
Smith Bros.,* Burnley	11,600

*Accepted.

(*Tenders continued on page viii.*)



Reduce your Wages by using
BROOM & WADE'S
PATENT HOIST.

This is the most Efficient Hoist on the market for hoisting barrows of bricks, concrete, &c., without Gearing.

BROOM & WADE, LTD.,
Engineers, HIGH WYCOMBE.

Telegrams—"Hoptonwood, Wirksworth." Telephone—No. 9 Wirksworth.

THE HOPTON-WOOD STONE FIRMS, Ltd.

QUARRY OWNERS and WORKERS of WHITE, GREY and DARK HOPTON-WOOD STONE, BIRD'S EYE, BLACK and FOSSIL MARBLES.

Wirksworth, DERBYSHIRE.

London Agency Office: 134, CHEAPSIDE.
Telegrams—"Guttridge, London." Telephone—2759 Central.

PEIRSON & Co
ST DUNSTAN'S HILL
LONDON, E.C.
& WANSTEAD WORKS

Telegrams "ALLEGRETTO, LONDON."
Telephone, 5951 AVENUE.

Copy of our HANDBOOK 1907. gratis

FIRE ESCAPE STAIRCASES
COMPLETE - TO LOCAL AUTHORITIES REQUIREMENTS

CONSTRUCTIONAL ENGINEERS

"ARCHITECTURE & JOURNALISM."

This is the title of a booklet, beautifully printed and illustrated, giving an interesting account of the publications issued by this Company.

This booklet contains a suggestion, and sets out an arrangement showing how Architects and others can utilize any particular points of interest that they come across in their practice, and thus not only add to their own incomes, but add to the value and practical interest of our papers.

SENT FREE on receipt of a post-card giving Name and Address of any reader.

Technical Journals, Ltd.,
Caxton House, Westminster, S.W.

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork

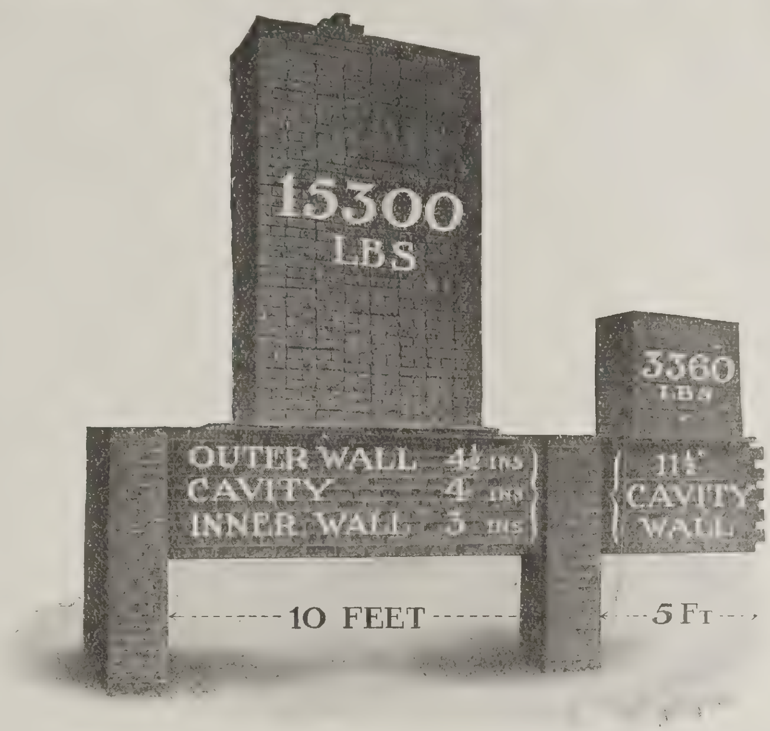
H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

RD. JOHNSON CLAPHAM, & MORRIS, Ltd.,



Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered Soundproof, Fireproof Dampproof,

Architects, Builders, and Contractors *Write for Descriptive Catalogue.*

Engineering Department,
24, Lever Street,
MANCHESTER.

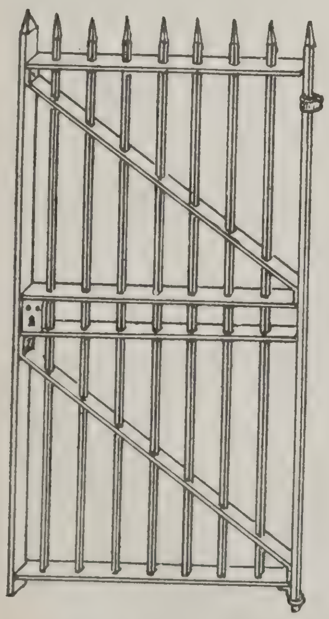
Telegrams; "Metallicus, Manchester."

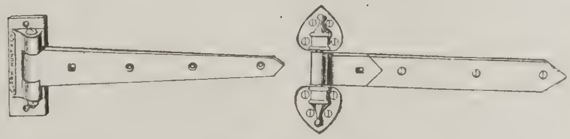
Hollow Wall and Cantilever constructed of 4½-in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

Telephone: 6437 Manchester.

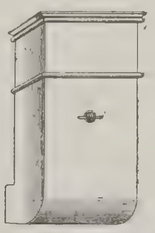
IRONWORK FOR COUNCIL SCHOOLS

GENERAL BUILDERS' IRONWORK.

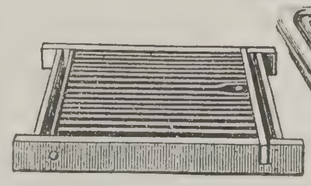


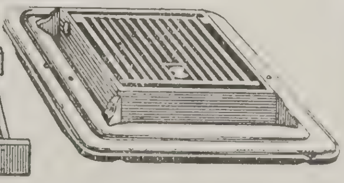


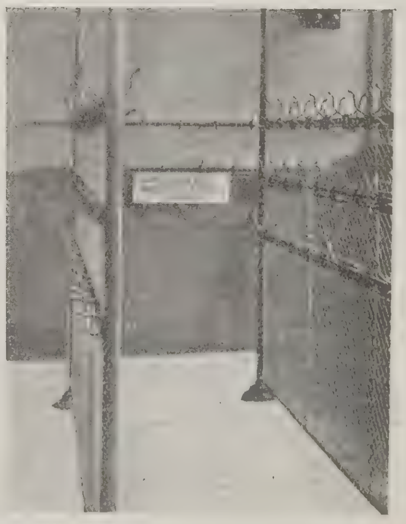
GATES . . and . . . RAILINGS.



TOBIN TUBES and GULLY GRATES.







PATENT HAT AND COAT RAILS.

CLARK, HUNT & CO., Ltd., *Middlesex Ironworks,* **Shoreditch, London.**

GENERAL CATALOGUE ON APPLICATION.

(Tenders continued from page vi.)

Letchworth, Herts. For the erection of a detached cottage, for Mr. G. T. Harvey. Messrs. Underwood and Kent, P.A.S.I., architects :—

H. E. Hurst	£467
Beckley and Turpie	455
A. E. Jeffs	380
A. Collins*	350

*Accepted.

Leyton.—For erection of the Canterbury Road Schools, Leyton, for the Leyton District Council; Messrs. J. S. Newman and Jacques, architects, 2, Fen Court, E.C. Quantities by Messrs. J. Rider, Hunt and Co. :—

Pasterfield and English, Streatham	£10,697	0	0
Perry and Co., Bow	10,433	0	0
A. Webb, Stratford	9,997	0	0
J. Cracknell, Peterborough ...	9,508	0	0
Brown Bros., Grays ...	9,379	15	6
Spencer, Santo and Co., Kensington High Street	9,320	0	0
Lole and Co., Chelsea	9,154	0	0
Harris and Wardrop, Limehouse	9,093	0	0
F. and E. Davey, Southend-on-Sea	8,977	0	0
Mattock and Parsons, Gray's Inn Road	8,975	0	0
A. J. Bateman, Hunts	8,966	0	0
Henson and Son, Wellingborough	8,868	14	10
B. E. Nightingale, Albert Embankment	8,860	0	0
J. T. Luton, Stratford	8,797	0	0
A. E. Symes, Stratford	8,794	0	0
F. and G. Foster, Norwood Junction	8,680	0	0
F. J. Coxhead, Leytonstone ...	8,483	0	0
E. and A. Willmott, Ilford ...	8,464	0	0
H. J. Carter, Grays	8,432	0	0
W. J. Maddison, Canning Town	8,384	0	0
Brand, Pettit and Co., South Tottenham	8,342	0	0
H. C. Horswill,* Forest Gate ...	8,310	0	0

Architect's estimate, £8,500.
*Accepted.

Lostwithiel.—For erection of five houses at Lostwithiel, for the Lostwithiel Building Co., Ltd. :—

Elliott and Son, Liskeard ...	£2,147	0	0
Endean and Co., Plymouth ...	1,880	0	0
W. E. Bennett, Bodmin	1,829	0	0
Treherne and Son, Liskeard ...	1,769	0	0
S. Sholbrook, Plymouth	1,711	10	0
Bassett Bros., Lostwithiel ...	1,641	0	0
W. T. Stevenson, Plymouth (for 3 houses)	960	0	0
A. E. Conybeare,* Plymouth ...	1,483	12	10

*Accepted.

London, E.C.—For the provision of accommodation for women at the underground convenience at Eastcheap, for the City Corporation :—

S. Kavanagh and Co.	£3,520	0	0
H. and E. Lea	3,489	0	0
G. Jennings, Ltd.	3,244	0	0
W. J. Fryer and Co.	3,191	6	10
Doulton and Co., Ltd.	3,181	0	0
W. Shurmur and Sons, Ltd. ...	3,043	0	0
McCormick and Sons	3,020	0	0
Adamsez, Ltd.	3,009	7	3
Jarman and Co.	2,992	0	0
Davis, Bennett and Co.... ...	2,923	8	0
W. N. Wagstaff and Sons ...	2,866	10	0
J. Greenwood, Ltd.	2,772	0	0
C. P. Roberts and Co.* ...	2,753	0	0

*Accepted.

St. Austell, Cornwall.—For erecting a new gallery, vestry, entrances, etc., at the United Methodist Church, Bugle, for the Rev. M. W. Chandler. Messrs. F. C. Jury and Son, architects, Tregonnsey Road, St. Austell :—

F. J. Stanbury	£710	0	0
T. J. Smith	579	3	0
W. T. Stevenson	570	0	0
R. Jacob	435	0	0
Williams and Burt,* Wadebridge	428	0	0

*Accepted.

Sutton.—For the erection and formation of the sub-structure for the blocks of model dwellings on the City Road Site, for the Trustees of the Sutton Estate. Mr. E. C. P. Monson, F.R.I.B.A., F.S.I., M.S.A., architect, Finsbury Pavement House, E.C. Quantities by Messrs. Stanger and Son, 21, Finsbury Pavement, E.C. :—

Wallis and Sons, Maidstone	£6,933
Willcock and Co., Wolverhampton ...	6,787
Kirk and Randall, Woolwich, S.E. ...	6,772
Dorey, J. and Co., Brentford, W. ...	6,684
Godson and Sons, Kilburn Lane, N.W.	6,488
Higgs and Hill, S. Lambeth Road, S.W.	6,484
Trollope and Colls, Coleman Street, E.C.	6,483
Parnell and Son, Rugby	6,477
Holloway Bros., Lambeth, S.E. ...	6,440
Minter, F. G., High Street, Putney, S.W.	6,286
Nightingale, B. E., Albert Embankment, S.E.	6,247
Patman and Fotheringham, Theobald's Road, W.C.	6,171
Lawrence and Sons, City Road, E.C.	6,131
Monk, Albert, Lower Edmonton, N....	6,088
Holliday and Greenwood, Brixton, S.W.	5,959
Sheffield Bros., Downs Park Road, N.W.	5,950
Dove Bros., Islington, N.	5,925
Kilby and Gayford, Worship Street, E.C.	5,636
Cubitt and Co.,* Gray's Inn Road, W.C.	5,555

*Accepted, subject to the approval of the Court of Chancery.

Westcliff-on-Sea.—For the erection of a boarding establishment, Pembury Road, Westcliff-on-sea, for Mrs. Morrish. Mr. Douglas H. Smith, architect, Westcliff :—

H. E. Campkin	£1,807	10	0
A. S. Barley	1,590	0	0
F. J. Green	1,585	0	0
W. Houghton,* Southend-on-Sea, and 7, Finsbury Square ...	1,520	0	0

*Accepted.

Whitchurch, near Cardiff.—Accepted for the construction and erection of farm buildings in connection with the mental hospital at Whitchurch, near Cardiff, for the Mental Hospital Visiting Committee of the Cardiff Corporation :—

W. T. Morgan, Tydraw Road, Cardiff, £2,174.

Winsford, Cheshire.—For erection of additional class rooms, lecture room, etc., at the United Methodist Free Church School, High Street, Winsford. Messrs. Alfred Price and Son, architects, Sandbach :—

Sergeant Bros.	£1,056	0	0
Birchall Bros., Middlewich ...	1,020	0	0
J. Finney	1,003	10	0
Chapel	999	0	0
Pickstock and Royle, Holmes			
J. Wilson	970	10	0
A. H. Court	960	0	0
E. Curzon	920	10	0
Dickinson and Noden	799	0	0
J. Fowles and Sons*	995	0	0

Rest of Winsford.
*Accepted.

Worksop.—For erecting offices in Carlton Road, for the Waterworks Company. Mr. A. H. Richardson, architect, Market Place, Worksop :—

D. Gill and Sons	£2,077	0	0
Ilett and Sons	2,025	0	0
H. and A. Forsdike	1,985	0	0
J. Doncaster	1,950	0	0
Bowles and Son	1,942	0	0
G. G. Middleton	1,936	0	0
C. A. Leverton	1,919	18	0
F. J. Rowsell	1,804	15	0
Perks and Sons, Ltd.,* Long Eaton	1,699	0	0

*Accepted.

Correction.—In the lists of tenders published on February 24th, it should have been stated that the tender of Mr. T. Spencer for the erection of the Liscard Masonic Hall arrived too late for consideration.

'Phone Holborn 1562.

The Brilliant Sign Co. 1907 Ltd.

Original Manufacturers of Brilliant Sunk Gilt Copper Window Letters.

THE LARGEST MANUFACTURERS IN THE WORLD OF

PLATE GLASS FACIAS
STALLPLATES
SWING SIGNS
GILT WOOD LETTERS
ILLUMINATED SIGNS
(of every known style)
REPOUSSÉ COPPER WORK
WINDOW LETTERS

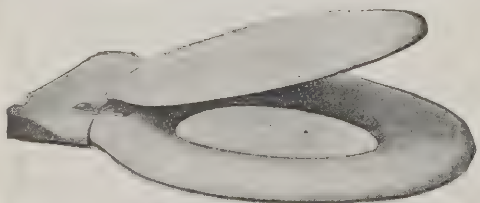
Guaranteed Best Work—Keenest Rates in the Trade.

60 pp. Illustrated Art Catalogue Free.

Wire: "Signboards, London."

38 Grays Inn Rd London W.C.

BRILLIANT SUNK GILT COPPER PLATE GLASS FACIAS, &c.



SANITARY SEATS.

INDENTS THROUGH SHIPPERS.

EAST BROTHERS,
Lochee Cabinet Factory,
DUNDEE, SCOTLAND.

THISTLE (REGD) BRITISH MANUFACTURE

TILES. MOSAICS. FAIENCE.

CRAVEN DUNNILL & CO., LTD.,

Jackfield, S.O., Shropshire.

ENAMELS. LUSTRES. WALLS.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

March 12. BIRKBY.—Erection of two semi-detached houses in Wheathouse Road, Birkby. Drawings, etc., at the offices of Norman Culley, A.R.I.B.A., architect, 13, John William Street, Huddersfield. Tenders to be submitted by March 12

March 12. WELLINGTON CROFT, NEW BLYTH.—Execution of mason, carpenter, slater, and plaster works, in a new dwelling house, at Wellington Croft (Scott), Byth, New Byth. Plans, specifications, etc., with the tenant, or with Davidson and Garden, 12, Dee Street, Aberdeen, with whom offers are to be lodged by March 12.

March 13. ABERYSTWYTH.—Erection of a warehouse in Llanbadarn Road, for Mr. Samuel. Plans, etc., at the office of Mr. Llewelyn Samuel, 12, Northgate Street. Tenders to be submitted by March 13.

March 13. BRADFORD.—Execution of alterations and additions to Paddock Dyeworks, Pasture Lane, Clayton, Bradford. Plans, etc., at the office of Sam Spencer, architect, Old Bank Chambers, Great Horton, Bradford. Tenders to be submitted by March 13.

March 13. ASKRIGG, STALLING BUSK.—Erection of a church for the vicar and wardens of Askrigg at Stalling Busk. Plans, etc., at the vicarage, Askrigg, or at Barclay's Bank, at Hawes. Tenders by March 13, to T. Gerard Davidson, M.S.A., 44, Great Russell Street, London, W.C.

March 13. PERTH.—Construction of greenhouses, etc., at Wellshill cemeteries, for the T.C. Plans, specifications, and forms of tender, at office of James W. Bayne, superintendent of cemeteries, Wellshill, Perth. Tenders with John Begg, town clerk, Perth, endorsed "Tender for greenhouses," by March 13.

March 13. WELSHPOOL.—Execution of works at the Welshpool Savings Bank for the trustees. Plans and specifications on application to the secretary, John Evans, 24, Broad Street, Welshpool. Tenders before noon on March 13, to Frank H. Shayler, F.R.I.B.A., architect, Clive Chambers, Shrewsbury.

March 13. CARDIFF.—Conversion of a laundry into a female vagrants' ward at the workhouse, for the guardians of Cardiff Union. Apply to Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff, from whom bills of quantities and forms of tender may be obtained on deposit of £2 2s. Tenders to Arthur J. Harris, clerk, union offices, Queen's Chambers, Cardiff, by 10 a.m., on March 13.

March 15. ENNERDALE.—Erection of a churchyard wall at St. Mary's Church, Ennerdale. Particulars from Rev. T. Price, Vicarage, Ennerdale, to whom tenders are to be submitted by March 15.

March 15. EDINBURGH.—Execution of following works for one year from May 15, for the corporation:—Mason, wright, plumber, gasfitter, smith, engineer, painter. Schedules and forms of tender at the office of the city superintendent of works, City Chambers. Offers with the town clerk, City Chambers, by March 15.

March 15. MARGATE.—(1) Tiling the pit with Ostend tiles and carrying out other work at the Oval arena; and (2) building stages for entertainments on the marine terrace sands, for the corporation. Plans and specifications of the borough surveyor, 13, Grosvenor Place, Margate. Tenders by 1 p.m. on March 15, to John E. Saxby, secretary, town hall, Margate.

March 15. SENGHENYDD, NEAR CARDIFF.—Erection of a church at Senghenydd, for the Rev. Lloyd Rees. Plans and specifications, etc., on deposit of £2 2s. Tenders by March 15, to E. M. Bruce Vaughan, F.R.I.B.A., architect, Cardiff.

March 15. YNYSHIR.—Erection of new chapel, vestry, and class-rooms, for the trustees. Plans, etc., at office of R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy, and bill of quantities, etc., on deposit of £1 1s. Tenders to be submitted by March 15.

March 15. PRESTON.—Erection of a wall on the land recently purchased for the extension of the cemetery, for the burial board. Particulars may be obtained at the office of Myres, Veevers, and Myres, 15, Chapel Street, Preston. Tenders to be submitted by March 15.

March 15. COVENTRY.—Erection of buildings for the proposed refuse destructor, Bishopgate Green, for the general works committee of the corporation. Drawings, etc., may be inspected, and bill of quantities, obtained, after payment of £1 1s. to the city treasurer, on application to the office of J. E. Swindlehurst, city engineer and surveyor, St. Mary's Hall, Coventry. Tenders by March 15.

March 16. SHOTTON AND TANFIELD.—Erection of a new council school at Shotton colliery; also alterations and repairs to Tanfield council school, for the Durham C.C. Plans, etc., and bills of quantities at the office of the county education architect, Shire Hall, Durham. Tenders to be submitted by March 16.

March 17. STOCKPORT.—Erection of proposed Primitive Methodist Church and schools, Edgeley, Stockport. Quantities from (Rev.) Wm. Evans, 6, Beauchamp Street, Shaw Heath, Stockport. Estimates by noon on March 17. Further information from Wrathmell and Blackshaw, architects, Queen's Buildings, St. Peter's Square, Stockport.

March 18. DERBY.—Alterations to old slaughterhouses, Sattle Market, for the corporation. Plans, etc., of John Ward, M.Inst.C.E., borough surveyor, Babington Lane, Derby, on deposit of £1 1s. Tenders by noon on March 18, to the town clerk, 15, Tenant Street, Derby.

March 19. CLECKHEATON.—Erection of a secondary and technical school, for the U.D.C. Specifications and bills of quantities, after March 6, on application at the town hall, upon deposit of £1 1s. Plans and details at the office of the architect, W. H. Thorp, Phœnix Chambers, South Parade, Leeds. Tenders, endorsed "Tender for —— Work," by 4 p.m., on March 19, to John H Linfield, clerk to the council, town hall, Cleckheaton.

March 20. STAMFORD.—Erection of a six-roomed cottage at Hudd's Mills, Uffington Road, Stamford, for the corporation. Particulars upon application to the borough engineer, town hall, on deposit of 10s. Tenders by March 20, to Fredk. R. Ryman, A.M.Inst.C.E., borough engineer, town hall, Stamford. Local builders invited to tender.

March 22. CARRICKFERGUS.—Erection of a building, High Street, Carrickfergus. Plans and specifications at the offices of the architects. Tenders by 4 p.m., on March 22, to Samuel P. Close and Son, architects, 13, Donegall Square North, Belfast.

March 22. SLEAFORD.—Alterations and additions to the Wesleyan Church premises, Sleaford, for the trustees. Plans at the Wesleyan Church, Sleaford. Tenders to the Rev. E. Jope, Sleaford, by five p.m., on March 22nd. Quantities of A. E. Lambert, architect, 22, Park Row, Nottingham, on deposit of £1.

March 23. ISLINGTON.—Extension of stables and repairs to the roof at the depot, Liverpool Road, N., for the corporation. Drawings and specification, etc., on and after the 16th inst., upon application to the borough engineer, J. Patten Barber, town hall, Upper Street, N., and deposit of £2 2s. Tenders to Wm. F. Dewey, town clerk, town hall, Upper Street, N., by 4 p.m. on March 23.

March 23. LONDON.—(1) Execution of repairs and minor works in connection with fire brigade stations, offices, stores, and other buildings belonging to the L.C.C.; (2) erection of hoarding, shoring, fans, fencing, notice boards, etc., for the L.C.C. Full particulars in the "London County Council Gazette," March 8, to be obtained from P. S. King and Sons, 2 and 4, Great Smith Street, Westminster, S.W. Forms for (1) from the architect measuring surveyor's section, 19, Charing Cross Road, W.C.; and (2) from the valuer, 9, Spring Gardens, S.W., upon deposit with the cashier of £2 2s. and £1 respectively. Tenders to G. L. Gomme, clerk of the L.C.C., County Hall, Spring Gardens, S.W., by 11 a.m. on March 23.

March 24. HULL.—Construction in reinforced concrete of a swimming pond, 90ft. by 35ft., together with sub-structure of main building, 109ft. by 76ft., including foundations, floors, gallery, and main walls to gallery level, for the corporation. Forms of tender, etc., of A. E. White, M.Inst.C.E., city engineer, town hall, on deposit of £1. Prints of contract plans on payment of 5s., not returnable. Remittances to T. G. Milner, city treasurer. Tenders to the chairman of the baths sub-committee, at the town clerk's office, by March 24.

March 26. DENNY.—Construction of new station buildings at Denny, for the Caledonian Railway Company. Drawings at the office of the company's engineer, Buchanan Street station, Glasgow. Specification and schedule on deposit of £2 2s. Tenders by March 26, to J. Blackburn, secretary, Caledonian Railway Company's Offices, 302, Buchanan Street, Glasgow.

March 27. GOLBORNE, NEAR WIGAN.—Alterations and additions at Parkside Mill School, Golborne, for the Lancashire education committee. Plans, etc., at the office of the county architect, on deposit of £2. Tenders before noon, on March 27, to Henry Littler, county architect, 16, Ribblesdale Place, Preston.

ENGINEERING.

March 15. MARPLE.—Supplying one set of three-throw horizontal ram pumps, to deliver 6,000 gallons per hour against a working pressure of 130lb. per square inch, delivered and fixed at the station, Norbury, for the U.D.C. Complete specification of pumps offered required; also inclusive price for fixing. Tenders to the chairman of the council, public offices, Market Street, Marple, before 4 p.m. on March 15. Further particulars from D. J. Diver, the council's surveyor, public offices, Marple.

March 22. MILTON, LYMINGTON.—Erection of a ferro-concrete bridge over the stream at Fernhill, in the parish of Milton, for the R.D.C. Particulars of S. Crittall, surveyor, Sway. Tenders by March 22, to J. Davis Rawlins, clerk, 38, High Street, Lymington.

March 23. HANDFORTH, CHESHIRE.—Supplying and fixing a Cornish boiler at the Styal Cottage Homes, Handforth, Cheshire, for the guardians of the poor of Chorlton union. Specifications from the Manchester Steam Users' Association, 9, Mount Street, Albert Square, Manchester. Tenders by March 23, to David S. Bloomfield, clerk to the guardians, union offices, All Saints', Manchester.

IRON AND STEEL.

March 13. CARDIFF.—Providing and fixing iron railings, etc., at the hospital, headquarters homes, Ely, for the Cardiff union. Specification, with form of tender, of the clerk. Tender, with specification attached, by 10 a.m., on March 13, to Arthur J. Harris, clerk, union offices, Queen's Chambers, Cardiff.

March 15. HINDLEY.—Supplying the following for the year ending March 31, 1910, for the U.D.C.:—1, wrought iron tubes and fittings; 2, gas meters; 3, gas fittings; 4, water fittings; 5, lead, gas, and water pipes; 6, gas main cocks; 7, sulphuric acid. Forms of tender of H. O. Timmins, engineer, gas works. Tenders to T. Robey, clerk to the council, by March 15.

March 15. BURSLEM.—Supplying about 300 lineal yards of wrought iron unclimbable fencing, 5ft. 6ins. high, and about 60 lineal yards of wrought iron palisade fencing, 2ft. 6ins. high, with 4 pairs of wrought iron entrance gates, for the Corporation. Particulars F. Bettany, borough engineer and surveyor, municipal offices. Tenders to A. Ellis, town clerk, town hall, by March 15; fair wages clause.

March 16. LONDON (FOR MADRAS).—Supplying wrought iron (angles, flats, rounds, squares, sheets, and plates), as specification, at the offices of the company. Tenders by noon on March 16, to H. Bonham-Carter, secretary, 91, York Street, Westminster, S.W. £1 1s. for specification (not returnable).

PAINTING.

March 11. WALSALL.—Painting portions of the workhouse buildings, for the guardians. Specification to be seen on application to the master of the workhouse. Tenders to be submitted by March 12.

March 12. GRAVESEND.—Painting and redecorating the interior of the market, for the town council. Specification at the borough surveyor's office, town hall, Gravesend. Tenders to be submitted by March 12.

March 13. CARDIFF.—Execution of internal colouring, painting, and papering, at the Ely workhouse, for the Cardiff union. Specification, with form of tender, of the clerk. Tender, with specification attached, by 10 a.m., March 13, to Arthur J. Harris, clerk, union offices, Queen's chambers, Cardiff.

March 15. GOSFORTH.—Painting work for the committee of visitors of the Newcastle-upon-Tyne city lunatic asylum, Gosforth. Form of tender on application to the clerk of the asylum. Tenders to be submitted by March 15.

March 15. PEMBERTON.—Cleaning, painting, and decorating the Carnegie Library, Pemberton, for the Wigan Corporation. Particulars at the office of the borough engineer, King Street West, Wigan. Tenders by March 15, to Harold Jevons, town clerk, Municipal Offices, King Street West, Wigan.

March 15. DUBLIN.—Cleaning, painting, etc., the roof of Amiens Street terminus, for the Great Northern Railway Company (Ireland). Apply to W. H. Mills, engineer-in-chief, Amiens Street terminus, Dublin. Tenders by 10 a.m., on March 15, to T. Morrison, secretary, secretary's office, Amiens Street terminus.

March 23. LONDON.—Cleansing and re-painting Westminster Bridge, for the L.C.C. Particulars on application to the chief engineer, Maurice Fitzmaurice, C.M.G., County Hall, Spring Gardens, S.W., and deposit of £1. Tenders by 11 a.m. on March 23 to G. L. Gomme, clerk to the L.C.C., County Hall, Spring Gardens, S.W.; fair wages clause.

PLUMBING & SANITARY

March 12. TROWBRIDGE.—Erection of a urinal, also extension of water main and fixing hydrants, etc., in the cattle market, for the U.D.C. Plans and specifications of H. G. Nicholson-Lailey, town surveyor, town hall. Tenders to the chairman of the market committee, at the office of the surveyor, by March 12.

March 15. BARNSLEY.—Laying a 2 and 3-inch cast-iron water service pipe line from near Notton station, Great Central Railway, to Notton village, for the R.D.C. Plans and specifications and bill of quantities at the offices of Crawshaw and Wilkinson, surveyors, 13, Regent Street, Barnsley, to whom tenders are to be submitted by 4 p.m., on March 15.

March 17. KIRKCALDY, FIFE.—Supplying and laying about 3,200 lineal yards of fireclay sewer pipes of 9, 10, and 12 inches diameter, and construction of manholes, at Windygates and Balcurvie, for the Kirkcaldy District Committee of the Fife C.C. Apply to William Lockhart, C.E., 220, High Street, Kirkcaldy. Tenders with Alexander and David Beveridge, joint district clerks, 220, High Street, Kirkcaldy, by March 17; £1 deposit.

March 24. BRAINTREE, ESSEX.—Construction of sewerage and sewage disposal works for the U.D.C. Plans at the office of the engineers, Sands and Walker, Milton Chambers, Nottingham, and conditions, specification, and quantities, on deposit of £3 3s. Tenders by 10 a.m. on March 24, to Herbert J. Cunnington, clerk to the council, Braintree, Essex.

March 27. ASHBORNE (DERBYSHIRE).—Construction of new stoneware and iron pipe sewers, dortmund and septic tanks, filter beds, etc., for the U.D.C. Plans of the engineer, W. H. Radford, C.E., Albion Chambers, King Street, Nottingham, on deposit of £3 3s. Plans, specifications, and quantities also at the surveyor's office, town hall, Ashborne. Tenders by March 27, to R. Williams, clerk to the council, council offices, Ashborne.

ROADS AND CARTAGE.

March 12. STAPLEFORD.—Completion of Horace Avenue and Church Lane, for the R.D.C. Plans and specifications at the office of F. R. Hanley, surveyor of the council, Wood Street, Ilkeston. Tenders by March 12, to Frederick Wm. Fox, clerk to the council, 11, Park Row, Nottingham.

March 15. SPENNYMOOR.—Supplying road metal for the year ending March 31, 1910, for the U.D.C. Particulars and forms of tender of C. R. Spencer, surveyor, council offices, Spennymoor. Tenders by March 15, to F. Badcock, clerk to the council, council offices, Spennymoor.

March 15. STEYNING (SUSSEX).—Supplying flints before October 1, for the R.D.C. Forms of tender of the clerk, or of the surveyor of the council, F. Slaughter, High Street, Steyning. Tenders by March 15, to Arthur Flowers, solicitor and clerk to the council, union offices, New Shoreham.

March 15. ASTON-CUM-AUGHTON.—Levelling, metalling, kerbing, channelling, and making-up Park Street, at Swallownest, in the parish of Astom-cum-Aughton, for the Rotherham R.D.C. Particulars of B. Hey, surveyor of the council, Imperial Buildings, Rotherham. Tenders by 5 p.m., on March 15, to Oxley and Coward, clerks to the council, 6, Westgate, Rotherham.

March 15. CHESTER-LE-STREET.—Supplying (1) whinstone, limestone, and blast-furnace slag; (2) carting same from various stations on to the roads, for the year ending March 31, 1910. Apply to Geo. W. Ayton, highway surveyor, Chester-le-Street, to whom samples, showing quality and size, are to be sent. Tenders to the surveyor's office by first post on March 15.

March 15. PLYMOUTH.—Making-up and completing the following streets and lanes, for the corporation:—(1) Neath Road, section 3; (2) Rowden Street; (3) Carmarthen Road, section 1; (4) Oxford Avenue Lane North; (5) Short Park Road Lane South. Plans and specifications, etc., of James Paton, borough engineer, municipal offices, Plymouth, to whom submit tenders by 5 p.m., on March 15.

March 16. THURNSCOE.—Supplying materials for the year ending March 31, 1910, for the U.D.C., broken granite, granite chippins, rough dross, hand-broken dross, dross screenings, flags, kerbs, setts, channelling, asphalte, pipes, etc. Forms of tender from the clerk. Tenders, endorsed "Materials," by March 16, to J. Ledger Hawksworth, clerk, Bolton-upon-Dearne, Rotherham. Samples to the surveyor, R. Higginbottom, Thurnscoe.

March 27. GATESHEAD.—Supplying the following materials for one year, for the corporation: Whinstone macadam, granite macadam, whin setts, whin curb, whin channel, whin wheelers, limestone macadam, freestone curb and flags, metal gullies, manhole covers, etc., shovels, picks, scavenging brooms, lime and cement. Specifications, etc., of N. P. Pattinson, borough surveyor, town hall. Tenders by noon, on March 27, to W. Swinburne, town clerk.

MISCELLANEOUS.

March 13. CARDIFF.—Supply of joiners' fittings for laundry at Cardiff workhouse, for the guardians of Cardiff union. Plans and specification by Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff. Forms of tender of the architect. Tenders to Arthur J. Harris, clerk, union offices, Queen's Chambers, Cardiff, by 10 a.m., on March 13.

March 16. LONDON.—Supply and erection of open pale oak fencing at Ruskin Park, Denmark Hill, S.E., for the L.C.C. Drawing and specification, forms of tender, and other particulars at the Parks Department, 11, Regent Street, S.W. Tenders to the clerk of the L.C.C., Spring Gardens, S.W., by 11 a.m., on March 16. Fair wages clause.

March 19. LONDON.—Taking up and relaying new floor in nurses' home, Raine Street, E., for the parish of St. George-in-the-East. Apply to R. Murray Lochner, clerk, Raine Street, Old Gravel Lane, E., to whom submit tenders by 2 p.m., on March 19.

March 17, 1909. Volume 29. No. 11.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: Fair Wages Clause in Government Contracts; Builders' Liabilities; Soot and Suggestion; Labels and Lamp-posts, 227; The Glorified Glasshouse; Over-elaboration - - - - - - - - - 228
Notes and News - - - - - - - - 228
The Royal Academy Exhibition - - - - 228
Ideas in Things - - - - - - - 229
Notes on Competitions - - - - - - 230
Our Plate - - - - - - - - - 230
Proposed New London Buildings - - - 230
House in the Cleveland District - - - - 230
Enquiries Answered - - - - - - 232
Birmingham Clerks of Works and Builders' Foremen's Association - - - - - 232
Architectural Societies: R.I.B.A., 232; Northern Architectural Association, 232; Society of Architects, 233; Devon and Exeter Architectural Society - - - 233
Law Cases - - - - - - - - - 233
Design and Craft in English Woodwork - - 234
The New London Building Regulations - - 235
The Sweated Industries Bill - - - - 236
In Parliament: The Queen Victoria Memorial; The Facing of Ferro-Concrete; Re-erection of Buildings in Jamaica; New Post Office for Bolton; Accidents and Lead-poisoning 246
Trade and Craft: Reinforced Concrete. Hamilton's Patent Window Fittings - - - 246
Coming Events - - - - - - - - 246
Tenders - - - - - - - - - vi., viii.
Complete List of Contracts Open xxiii., xxiv., xxvii.

FIRE-RESISTING CONSTRUCTION SECTION.

Test of a Reinforced Terra-cotta Column - 237
L.G.B. and a Fire Danger - - - - - 237
National Fire Brigades Union - - - - 237
Fire Protection at the Selfridge Stores - - 238
Fireproof State Buildings - - - - - 241
Tests with Extinguishers - - - - - 242
The Kohl Building. San Francisco - - - 242
Tests of Roller Shutter Doors - - - - 243
A New Test for Concrete - - - - - 244

ILLUSTRATIONS.

House in the Cleveland District, Yorkshire. James Forbes, Architect. View from Entrance Gate, 230; General View, 231; Plans, 231; Dining-room Fireplace - - 232
Emmanuel College, Cambridge. Chapel and Arcade, General View, 235; Measured Drawing by W. J. Walker Todd, Centre Plate.
Test of a Reinforced Terra-cotta Column: Section and Table of Compression Curves 237
Fire-protection at the Selfridge Stores: Fig. 1, Section of Reinforced Concrete Floor, 238; Fig. 2, Typical Panel showing Reinforcement in Floor, 238; Fig. 3, Part of General Plan, Floor Construction, 4th Floor, 239; Fig. 4, Details of Kinnear Shutter Doors, 240; Figs. 5, 6, 7, The Grinnell Sprinkler, 240; Fig. 8, Diagram of the Sprinkler System, 241; Fig. 9, Outline Diagram of Aero Fire Alarm - - - - - - - 241
The Kohl Building, San Francisco - - - 242
Tests of Roller Shutter Doors: View after the Test - - - - - - - - - - 243

Fair Wages Clause in Government Contracts. The debate on March 10th in the House of Commons on this question resulted in Mr. Hodge's motion, with which we dealt in our last issue, being amended; Mr. Sydney Buxton, Postmaster-General, on behalf of the Government, proposing the following: "That, in the opinion of this House, the Fair Wages Clause in Government contracts should be so amended as to provide as follows; the contractor shall, under the penalty of a fine or otherwise, pay rates of wages and observe hours of labour not less favourable than those commonly recognised by employers and trade societies (or in the absence of such recognised wages and hours, those which in practice prevail amongst good employers) in the trade in the district where the work is carried out. Where there are no such wages and hours recognised or prevailing in the district, those recognised or prevailing in the nearest district in which the general industrial circumstances are similar shall be adopted. Further, the conditions of employment generally accepted in the district in the trade concerned shall be taken into account in considering how far the terms of the Fair Wages Clauses are being observed. The contractor shall be prohibited from transferring or assigning, directly or indirectly, to any person or persons whatever, any portion of his contract without the written permission of the department. Sub-letting, other than that which may be customary in the trade concerned, shall be prohibited. The contractor shall be responsible for the observance of the Fair Wages Clauses by the sub-contractor." Mr. Buxton, in the course of his remarks, said: "In this matter there was no attack on capital or employers, on the contrary it was intended to support the position of good employers of labour, who found it profitable to employ good labour, to work reasonable hours and to pay good wages. It appeared to be the best step that could be taken in the interests of capital." He further said, "the cases of evasion were comparatively few, while some £25,000,000 a year was spent in Government contracts, the number of complaints only amounted to a score or so during the year." Under these circumstances, one wonders why any amendment of the existing clause is considered necessary. Mr. Buxton, however, considers that "the time has come when a more satisfactory wording is required, to limit the area of dispute, to secure greater uniformity of practice and greater promptitude." He then dealt with the defects of Mr. Hodge's proposal much in the sense of our article of last week and on the lines of the Departmental Committee's report, and claimed that his proposal obviated those defects. The Labour representatives very frankly accepted the views expressed by the Postmaster-General, and the resolution, as amended by him, was agreed to.

Builders' Liabilities. Among the law cases reported this week and last, there are two that are of special importance to contractors. One is an action for damages for serious injuries received by a boy who was playing near a building that was in course of demolition, and the other is a question of the enforcement of by-laws as to hoardings. In the first case, the contractors have to pay £130 damages. Whether or not they are insured against such contingencies we are unaware; but, at any rate, the event shows the extreme importance to contractors of covering their liabilities to the utmost extent possible. The case shows conclusively that it is not sufficient to insure against accidents to workmen. Contractors are further liable for accidents that may occur to the outside public, and, as the case in question proves very clearly, and, indeed, as contractors should be very well aware, such contingencies are by no means remote. There is no need to labour the obvious moral. Contractors cannot afford to "trust to luck" in such matters, and they will be wise if they avail themselves of the fullest facilities for insurance against every form of accident for which at any moment they may be held to be liable. In this respect their Federation will, we are assured, afford them all possible help. The by-laws case was dealt with last week. Here it will suffice to remark, without special reference to this particular case, that the value of organisation can be hardly better illustrated than in united protest against the arbitrary enforcement of ill-considered by-laws which act in restraint of trade.

Soot and Suggestion. Mr. Martin Harvey, the well-known actor, has made a suggestion to the Liverpool "Daily Post" that St. George's Hall should be thoroughly scrubbed, and pleads that the work be given to "a long line of workless men, humbly waiting to be kept alive by a little soup, served out to them from a perambulating kitchen," which incidentally came into his view "of one of the noblest buildings I have ever looked upon." It is refreshing to find a leader in one art taking so active an interest in a masterpiece of another art; and from the windows of his hotel Mr. Harvey seems to have detected at one and the same time a defect in this masterpiece, and the means to hand for its remedy. "Could not these men," he says, "be given pail, water and brush, and set to scrub the hall? Scaffolding and swinging platforms are not impossible; and what delight it would give the inhabitants of this great port to view the cherished building in all its pristine beauty." All it would mean is a penny rate; but we doubt if the Liverpudlian ratepayers will so joyfully rise to the occasion as Mr. Harvey presupposes. It may be the only way to recover the pristine beauty of the building; but we are doubtful if the effect aimed at is quite likely to commend itself to architects in general. But there is much truth in Mr. Harvey's contention that the only beauty of this great pile now visible is the skyline. "All the detail of frieze, capital, surface, light and shade, and framed sculpture is obscured by a coating of soot and grime." We have often pointed out how damage to the delicate mouldings and carvings on our public buildings results from allowing this accumulation of soot to remain and act as a sponge, absorbing the acid products of the atmosphere to work on the surface of the stone. If all these accumulations that clog the detail of this great bulding were removed, Mr. Harvey would no doubt waive his demand for the future restoration of its pristine beauty. We can assure him that the result would not be so beautiful as possibly he imagines.

Labels and Lamp-posts. The town-planning movement is probably responsible—innocently and indirectly—for the very interesting crop of parasitic propositions that are springing up on or about the grand trunk scheme. Such fungi are easily and promptly destroyed. There was, for instance, the brilliant suggestion, made in the House of Commons, to compel owners of slum property to affix plates bearing their names to the houses they owned. The idea was lightly brushed into nothingness by the President of the Local Government Board, who expressed the hope that his Town-Planning Bill would render such labels superfluous by abolishing the slums. The physically similar but spiritually very different proposal to label public buildings with an indication of their identity and with the name of the architect and the date of erection is still being mooted in the newspapers, to the perplexity of such architects as consider themselves to be concerned in it; for they are in a strait betwixt the desire for fame and the apprehension of disfigurement to the buildings; while the extremist refers rather contemptuously to the superfluity of all labels whatsoever, considering that the purpose of a building should be expressed in the design. This stern pedant would probably be at no loss if asked to provide the general public with some purely architectural means of discriminating between the Red Tape Department and the Circumlocution Office! Then, again, there has been a recent resuscitation of the proposal to turn street lamps to the sweet uses of advertisement. The borough councils to whom the application was made have rejected it with fine scorn. They have the grace to perceive that our streets are sufficiently hideous without such addenda; but they carry their scrupulosity to the verge of prudishness by steadfastly refraining from putting the lamps to what is surely a very legitimate use. "Heaven's Light our Guide" is no doubt a splendid motto for the Empire; but when it comes to the heroic endeavour to find a London address after nightfall, a little lamplight on the subject would be of inestimable service. In the suburbs, especially, where policemen and postmen are scarce, the search for a given house or a given street is quite a speculative adventure, from which thousands of persons of only average perseverance nightly retire baffled and discomfited. If we must have luminous labels, let them not be puffs of pills and potions, but a plain indication of where we stand. The refinement of this idea by some enthusiastic astronomer, who wants the lampposts to give us latitude, longitude, the time of day, the temperature and a weather forecast, is perhaps too ambitious; and the abolition of street names—which is again advocated in to-day's newspapers—in favour of the American system of numbers seems to find but little favour with "the man in the street," who has, perhaps, a better memory for names than for numbers, and who may be supposed to cherish a certain degree of sentimental regard for the old labels. But the labels should be conspicuous by night as well as by day. The thoughtful promoters of the Daylight Saving Bill may, when they are tired of playing with the clock, turn their attention to the hard case of the man in a dim and labyrinthine suburb trying to find, with the aid of a box of matches in a gale of wind, the particular number he wants of the 632,591 houses comprised in the administrative county of London. Nothing short of an Imperial Act will secure this much-needed reform; which, however, should not be carried out on strictly utilitarian lines. There should be some provision against the blighting influence of such street labels as are at present too common. An ugly label may kill the effect of a streetful of decent houses. The label should be at least inoffensive. Perhaps it is too much to claim that it ought to be artistic, although it might certainly be that without being either expensive or illegible.

"The Glorified Glasshouse." Architects will view with mixed feelings the endeavour to save the Crystal Palace. Many regard it as a monstrosity that we should be well rid of; others take the milder view that, as an example of daring and ingenious construction, it is worth preserving. At the influential meeting held at the Mansion House the other day, it was unanimously resolved that the great glasshouse ought to be "vested in the public and dedicated to their use for ever," but this decision obviously bore very little relation to the æsthetic point of view. What the representatives of the metropolitan borough councils and other authorities had chiefly in mind was the value of the Palace as a recreative and an educational institution; and, in particular, it was recalled that the Fine Art Courts show in chronological sequence the various phases through which architecture, sculpture, and mural decoration have passed during a period of more than 3,000 years, from the remote ages of Egyptian civilisation down to the sixteenth century; also that it houses excellent schools of engineering, and of art, music and literature; the art classes being remarkably well equipped. When, in 1851, Paxton's design for the Great Exhibition in Hyde Park was chosen, great was the disgust of architects; and when, in the following year, the building was re-erected at Sydenham, they protested against the perpetuation of the freak; and it is only by an effort that one can shake off the natural prejudice against the "glorified greenhouse;" of which the main building is rather more than 1,600ft. long, 390ft. wide, and 175ft. high, while the perhaps too familiar towers are 280ft. high. The cost of re-erection was £1,500,000; and the substitution of a building of less "questionable shape" seems, on this consideration, as well as on sentimental grounds—for the average Londoner will never admit that the gigantic conservatory is a blot on the landscape — to be quite out of the question. But the demolition of the Palace, and the obliteration of its 200 acres of open space is an alternative from which the most ardent speculative builder would shrink.

Over-Elaboration. Mr. Temple Moore, F.R.I.B.A., lecturing to the Sheffield Society of Architects and Surveyors on "The Use of the Gothic Styles in Modern Architecture," protested against the current tendency towards over-elaboration of detail. The niches and panelling, for instance, in the Houses of Parliament, though often excellent in design, are wearisome by excessive repetition. Nor is this fault peculiar to Gothic work. In moden Pallidian buildings the designer is apt to run riot with rustication and blocking of columns, oblivious of the dignity of simple wall surfaces and plain columns. Mr. Temple Moore, of course, by no means stands alone in these opinions. It is a commonplace of criticism that the blocking of columns is being greatly overdone, and one exponent of the vernacular (in language if not in architecture) has profanely impugned it as "the bolt-and-nut style." Mr. Temple Moore's more dignified protest is timely and welcome, and should make for restraint with regard to this too familiar feature of brand-new buildings; and as to rustication, it may be further urged that, for the buildings of great cities, it is rather an ill-considered style of dressing, because, to the thoughtful gaze, it suggests infinite possibilities in the harbouring of soot and mud and microbes, and the utter hopelessness of dislodging these undesirables. Rusticated masonry need not be utterly abolished; but, for hygienic considerations, it should be—rusticated, in a still stronger sense than that in which the term is understood at the universities.

Notes and News.

The second annual general meeting of the National Association of Master Monumental Masons and Sculptors, of 2, Clements Inn, London, W.C., will be held at Anderton's Hotel, Fleet Street, on Monday, March 29th, commencing with luncheon at 12 noon (the executive committee meeting at 11 a.m.). Meeting open to members only, commencing at 1 p.m., and a further meeting, open to members of the trade upon production of the trade cards, at 5 p.m., when matters of general interest will be discussed.

* * *

At a meeting of Orsett Rural Council, Mr. Hill-Willis reported, with reference to the amendment of by-laws to facilitate the use of concrete, that in his opinion the Council could with advantage adopt the amendments provided they insisted on ordinary external walls of domestic buildings being built with a cavity in the centre to make the wall damp-proof and equable in temperature; also that where the walls were less than 9ins. thick a suitable reinforcement be provided. The Clerk stated that a letter had been received from the Local Government Board with reference to the Council's application as to amending the by-laws to facilitate the use of concrete. It was proposed to refer the letter to a committee.

* * *

In the House of Commons on Wednesday last, Mr. Gladstone, repying to Mr. Fell (U.), stated that 420 quarries had been closed in the United Kingdom since 1905. They were distributed as follows: England 227, Scotland 100, Wales 33, Ireland 60. No doubt several of these quarries were worked out before they were closed. The decrease in the number of persons employed in quarries between 1905 and 1907 was 7,005, distributed as follows: England 2,543, Scotland 2,150, Wales 1,685, Ireland 627. It did not follow that all these men were thrown out of employment. The decrease was probably due in great part to the use in buildings of ferro-concrete and other substitutes for stone, a change which, while it led to a diminution of the numbers employed in quarries, involved an equal or greater increase of employment in other directions. The great majority of the men who had ceased to be employed were engaged in sandstone, limestone, or slate quarries.

ROYAL ACADEMY EXHIBITION, 1909.

The day for sending in architectural drawings to Burlington House is Friday, March 26th, from 7 a.m. to 10 p.m. As in past years we shall be happy to act as agents for delivering drawings to the Academy on the condition that we are allowed to reproduce any of the designs passing through our hands prior to their being sent in. We should appreciate the kindness of architects in forwarding their drawings as early as possible, and would mention that we can obtain more satisfactory results in the reproduction when we have plenty of time at our disposal.

Drawings for exhibition in the architectural room should be glazed and should have gold frames. Each frame must have a ticket pasted on the back, giving the number, title of the work, and the architect's name and address, to correspond with the particulars given on the printed forms, which must be obtained from the secretary at the Royal Academy, Burlington House, Piccadilly, W., and there should be attached to each frame, by string, a printed label (also supplied by the Academy) so arranged that it may hang over the front of the drawing. The printed form of advice should in all cases be forwarded to us to hand to the secretary on delivery of the drawings. No exhibitor may send more than three works, and we should recommend intending exhibitors to avoid wide margins or mounts to the drawings, as space is a considerable factor in the arranging of the architectural exhibits.

IDEAS IN THINGS.

Mr. Voysey was the lecturer at the Carpenters' Hall on Wednesday evening, 24th February, and at the commencement of his lecture said that he regarded the presence of his audience as expressive of a desire to improve something; to do some good to somebody, and this he took to be a healthy sign. This age we live in, he said, is intensely material. The steam engine and electricity have transformed the world, and our minds have been so taken up by material ideas that we have scarcely paid that attention to our spiritual nature which that part deserves. Our nature has always been twofold, viz., material and spiritual, and we must recognise the difference between thoughts and feelings which affect our hearts, and thoughts and feelings which affect our bodies. It is necessary also to draw a distinction between associated ideas and intrinsic ideas, the latter of which are always the more stable. Associated ideas may change, but intrinsic ideas never. A technical knowledge of any craft is but a language with which to express thought and feeling. We may, he said, make doors and windows, chairs and tables with mechanical exactness, but we shall obtain no spiritual benefit from our labour unless we put our hearts and minds into our work. The influence of a workman, through his productions, may be vain and frivolous, or dignified and full of restraint, according to his spiritual nature. The front of Rheims Cathedral was shown, and the lecturer drew attention to the way the subject-matter governed the whole work of the carvers. They had it in their heart, and told it as directly as they could, through their material. I believe, he said, that the old carvers obtained more enjoyment from their work than we do from ours, because they read less and thought more. Differences in the material condition of men have existed ever since the world began, but let us be sure that we all respond to the same virtues, love, self-sacrifice, simplicity, and truthfulness, for by so doing we have a common bond of union. The delight of expressing thoughts and feelings which arouse pleasure in others is in all of us. All we require is the power of discriminating between noble thoughts and feelings, and those that are baser. What are our schools doing to-day in this direction? Many of them, while telling us of the beautiful work done in past ages, deny that such work is possible in these dark ages. "We are all miserable sinners," they say, "and we must go on our hands and knees, and measure up and draw like parrots to imitate the work of the ancients." This, he said, was false teaching. Men can turn out to-day work as perfect in material qualities as in the past. We are far too keen on mechanical perfection, and in our materialism we have run after the perfection of the machine, and preferred it to the perfection of the human heart. You have all, he remarked, observed the soft effect of the outline of an old building when the angles were put up by eye, compared with the hard mechanical effect of the modern drafted angle. We must give up the sham of pretending to be Greeks and Romans in our architecture, and if we have no noble ideas, let us hide our heads in the sand until we get some. Reverence for Nature is a fruitful source of beauty. If our work is to be fit and beautiful it must express some healthy emotion. We make a great mistake in giving all our attention to men's work; it would be far better for us to watch the ways of Providence. When we are asked to design anything, we immediately look to see how someone else has done it. Our museums are crowded with examples, and there is every inducement to us to use the wits of others rather than our own. I am convinced, he said, that if we paid more attention to spiritual matters we should regard ugliness as a form of sin, and so should never look twice at it. Lavish ornament is like a drug, the dose requires increasing as it loses its effect. Speaking of the value of colour, he asked how could we get help from Nature in the matter of colour? She furnishes us with an abundance of the most soothing colour, namely, green; but red she uses very sparingly. In the spring she gives us delicate greens, blues, greys, etc., later on these are strengthened under the summer sun; then, when our eyes are tiring, come the oranges and browns of autumn. Nature never allows her colours to quarrel, the most brilliant colours are always in relatively small quantities, and it is the relative quantities of colour that make for harmony. The door, he said, may be a joy, and may express welcome and dignity, it may soothe or vex you. You may pass through it with pleasure or in pain. But the point to be considered is: Has the maker gained by his labour? Has he enriched his own character, and those also who observe his work? If we lived in a less material state of mind we should pay more attention to the observation of each other's work. He deprecated much of the so-called ornamental enrichments applied to our architecture in towns. We cannot, he said, be too simple. A true desire to be simple strengthens our sense of fitness. The carving of richly veined marbles and figured woods was an act of irreverence and conceit. Most of our houses, he said, resemble storms, and how few stand peacefully and in repose. They look more like spectres, and are composed of an infinite variety of shapes as well as an infinite number of differently coloured textures and materials. What, he asked, has the intimate knowledge of the history of Greece and Rome done for us? It has made us vain, not thoughtful; arrogant but not emotional. Let us say that we are at the end of a hideous night, for all around us are signs of spiritual activity and a reaction from materialism. In conclusion, several beautiful slides were shown, chiefly of the sculpture in various parts of Rheims Cathedral, the lecturer drawing special attention to the way the figures told their own story, this carving being the literature of the time.

Mr. Voysey delivered the second part of his lecture, entitled "Ideas in Things," at the Carpenters' Hall, London Wall, E.C., on Wednesday evening, March 3rd.

This evening, he said, I want you all to fancy you are architects, and commissioned to build me a home. We have only £3,000 to spend on land and buildings. We must be in easy reach of a railway, with constant thought of economy of time and money. We have a site with trees on undulating ground. There is a fine view to the north-west, and the main road also is on that side. Will it not then be better to capture the early morning sun than so to place our rooms as to keep the beautiful view? We have then fixed a south-east aspect, and our prospect will be best from the hall, staircase, or corridors on the north-western side. Our next thought should be the position of the house, and we must take care to show reverence for the trees, and for the levels of our ground. For the sake of sympathy and repose, we will choose the most level part. A straight drive to the house from the road will express decision and determination, avoiding any wobbling, which only denotes weakness. Economy will keep us near the entrance boundary. The en-

HOUSE IN THE CLEVELAND DISTRICT, YORKSHIRE: VIEW FROM ENTRANCE GATE.
JAMES FORBES ARCHITECT.

trance should be prominent, overlooking all the area on the roadside of the house. We should try to make our building subdued and restful, hiding behind the trees, not towering above them and looking down on them with scorn. A jagged angular outline against the sky, a mass of chimney stacks, and complicated roofs are often caused through want of thought. Our symplicity will result in economy of material and labour, and may leave a little spare cash for a spot of sculpture. You will gather your flues together and arrange your rooms in a way which will enable you to cover them with one roof, or as few roofs as possible. The wide door suggests welcome, but more than sufficient height suggests magnificence, and would only lead to disappointment if the rooms, for economy, are low. If the money at our disposal will not allow us to use oak joinery everywhere, let us use it nowhere. One little jewel-like spot of stained glass would be better than a quantity of material more costly than that used throughout the building. My architect must give me ventilation, and a system by which the air in my rooms is kept moving, and thus avoid draughts. Low rooms will help us greatly, and give us the benefit of reflected light. Our by-laws, in most districts, will not allow us to build rooms of good proportion. Small windows, with white ceilings and friezes, will not only produce light rooms, but preserve an equable temperature through the year. We like on entering a house to see our wants anticipated. A lavatory should be provided for coats and hats, boots, etc., to avoid mud being taken upstairs. It is desirable so to plan the house that the servants shall enjoy the same freedom to be merry as I enjoy myself. My noise should be shut off from them and theirs from me. The sitting and dining-rooms may be likened to human heads. The door is the mouth through which many good things pass, the windows are the eyes, and the fireplace is the heart, or the countenance of the whole face. You will so proportion my fireplace that there shall be ample room for all to gather round. Will you help me to respect local conditions of climate and soil, and ignore facilities of transit, using as far as possible material to harmonise with local character in colour and texture? In my rooms, the lecturer proceeded, I ask for no cornices, which produce shade; and no ornament on my ceilings, which I can only see by paining my neck. I want no finger-plates, because they suggest that I keep dirty fingers in my house. In arranging the furniture of my rooms, you will see that each piece has the place most suited to its use. If you give me one or two pieces in each room, such as pictures and sculpture, they will be infinitely more impressive than when in a crowd. I would rather delight you with the contemplation of one object, than bore you with a museum full, however beautiful they might be. Remember the machine that will probably assist in the making, and so let right proportions, the natural quality of your wood, and the colour and texture of the upholstery be everything. Enough has been said to lead you to introduce ornament, i.e., machine-made mouldings, etc., only when it is needed on practical grounds—for example, the moulding of a skirting board, to avoid a ledge for dust. The effect of meaningless elaboration is called richness by some. Real richness is only obtained by the use of precious materials, concentrated and harmoniously arranged. In arranging my guest chamber, would it not charm my visitor more to find all his wants anticipated, rather than find his room a reproduction of the bed-chamber of a foreign potentate? In olden days, the four-post bedstead suggested protection; but since then the sanitary expert has come along to persuade us that we want more fresh air than our forefathers, and iron and brass bedsteads were introduced with their glitter and tawdry effect. As to floor coverings, we must remember that the floors are backgrounds, and so the pattern should not interfere with the objects seen against it. If then in building for me you find so many conditions and feelings to be thought of and served, so in all for whom you work. In lighting, he said, although we all want abundance of light for work or play, yet we do not want windows that have to be covered up by upholstery both by day and night. In conclusion, Mr. Voysey gave his "architects" these instructions: Think of the needs of the spirit more than the needs of the flesh. Then, and only then, shall we have really good architecture, really good carpentry, and really good work of any kind.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Mar. 24.	*HALL AT EASTLEIGH, HANTS, to be erected adjoining the Railway Institute for the L.S.W. Railway Co. Particulars and site plan from the Secretary, L.S.W.R., Waterloo Station, London, S.E. Deposit £1 1s. Designs to be sent in at 10 a.m. on date given.
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days.
April 10.	BOLTON BRANCH PUBLIC LIBRARIES. The Libraries Committee of the Corporation invite competitive plans from architects who have been principals in the County Borough of Bolton six months prior to the present date for Branch Public Libraries to be erected in the districts of Astley Bridge, Halliwell, and Gt. Lever. The plans and particulars may be obtained from Samuel Parker, Town Clerk, Town Hall, Bolton. Deposit, two guineas.
April 12.	ELLAND NEW SECONDARY SCHOOL. Architects having offices and practising in the West Riding of Yorkshire are invited to compete for the work in connection with the new Secondary School at Elland, and should apply for particulars to Mr. Leonard Clegg, Holiwell Green, near Halifax.
July 31.	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50. and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	BOURNEMOUTH BRANCH PUBLIC LIBRARY. Architects practising in the County Borough of Bournemouth are invited to submit designs for a new Branch Library at Boscombe. Particulars from Charles Riddle, Borough Librarian, Central Library, Bournemouth.

* The Secretary of the R.I.B.A. requests members to communicate with him before completing their designs in this competition. The conditions are under the consideration of the Council.

Our Plate.

The measured drawing, by Mr. W. J. Walker Todd, shows the chapel font and part of the arcade of Emmanuel College, Cambridge, which were built between the years 1668 and 1677, the chapel having the date 1673 over the clock. The architect employed was Dr., afterwards Sir Christopher, Wren, who at the time was actually engaged on the erection of the new chapel at Pembroke College. His employment at Emmanuel was probably due to his constant intercourse with the master, Dr. William Sandcroft, who was also Dean of St. Paul's, upon the rebuilding of which Wren was also engaged. The design for the Emmanuel Chapel was elaborated by Sandcroft, probably in consultation with Wren, and Dr. Sandcroft took great interest in the work of erection, and contributed largely to his funds. The woodwork of the chapel was designed by a Mr. Oliver and a Mr. Pierce, and executed by Cornelius Austin.

Proposed New London Buildings.

The following new works were among those recommended for consent to the Council meeting of Tuesday last:—

Erection of a building on the southern side of High Street, Clapham, to abut also upon the western side of Cato Road, on the application of Mr. A. C. Thomas, on behalf of Temperance Billiard Halls, Limited.

Erection of a building on the eastern side of Briant Street, New Cross, on the application of Mr. L. V. Hunt, on behalf of the British Colour Printing Company, Limited.

Erection of a house on the eastern side of Garthorne Road, Honor Oak Park, to abut also upon the northern side of Agnew Road, with projecting bays and a porch, on the application of Messrs. Dunsmore Brothers.

Erection of two houses on the northern side and two houses on the southern side of Baldry Gardens, two houses on the northern side and one on the southern side of Heybridge Avenue, and sixty-six houses on the eastern and western sides of Copley Park, Streatham, on the application of Messrs. Hill and Tyler.

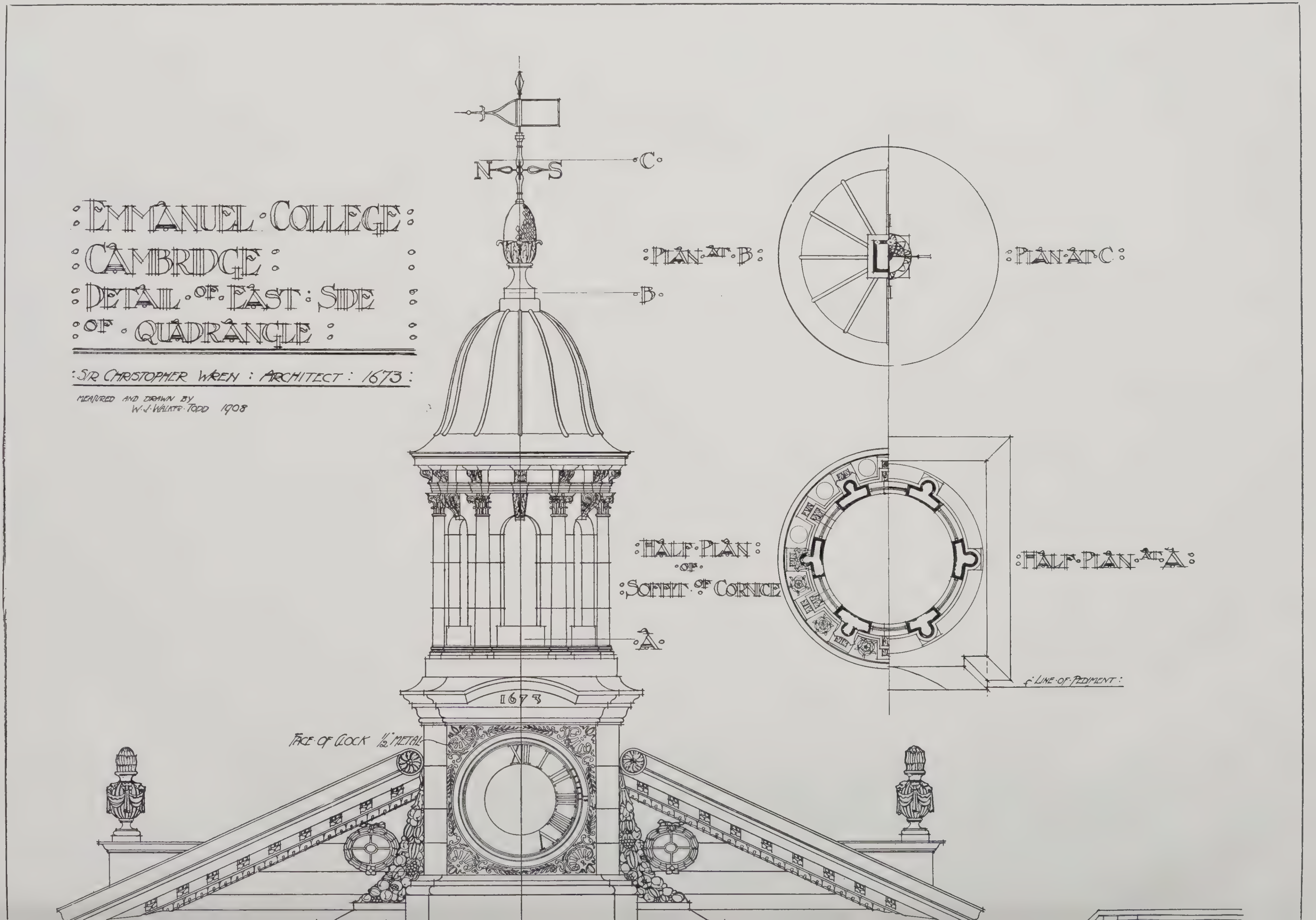
Erection of buildings on the eastern side of Bromley Road, Catford, on the application of Messrs. Norfolk and Prior, on behalf of Mr. J. Watt.

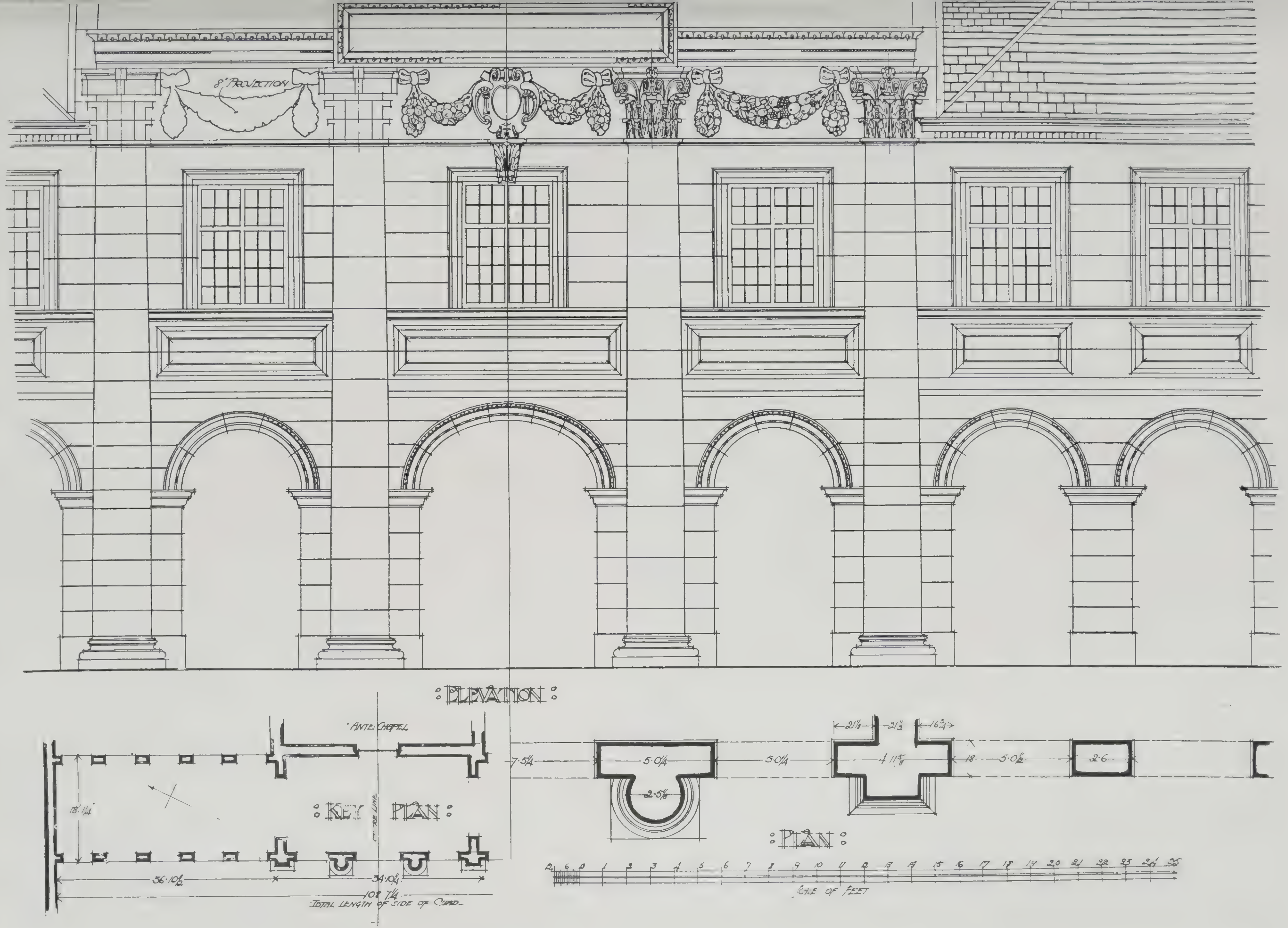
Erection of buildings on the site of Nos. 59 and 61, Webber Street, Southwark, on the application of Mr. W. Egerton, on behalf of Maltina Bakeries, Limited.

Erection of two houses on the northern side of George Lane, Lewisham, to be known as Nos. 175 and 177, with irregular open spaces at the rear, on the application of Mr. F. E. Wright.

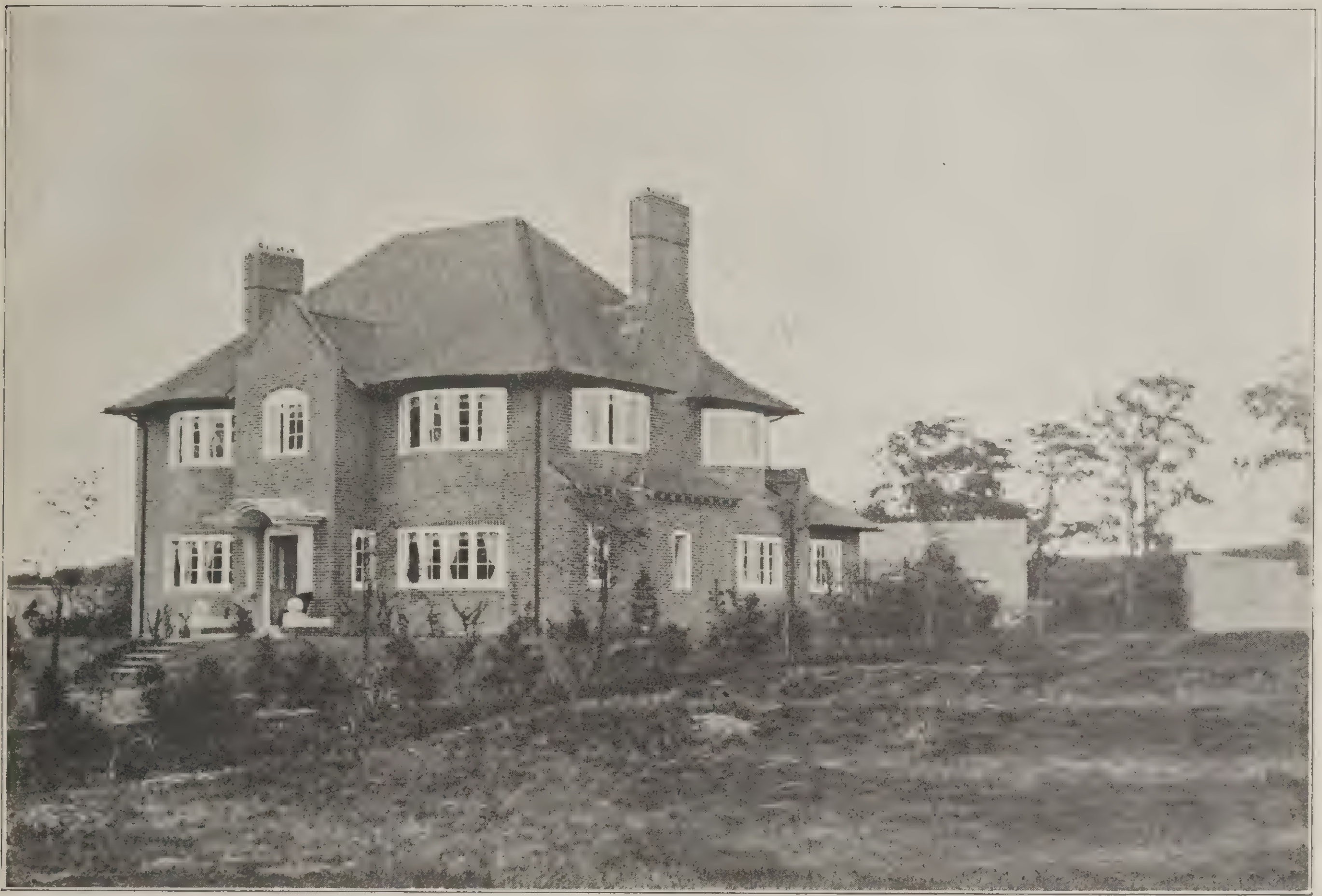
HOUSE IN THE CLEVELAND DISTRICT.

This small country house has recently been erected in a picturesque part of the Cleveland district. The site was well adapted for placing the building on a natural terrace fronting a spacious lawn, from which to the entrance from the road the land is nicely wooded with fine oak and beech. The elevations have been kept simple, 2¼in. Loughborough sand-faced bricks being used, with half-inch flush joints; the tiles are hand made of the same material, mixed indiscriminately with various grades of rough and smooth faces. No lead flashings have been used, all tilework being tilted next brickwork and carried into chase in brickwork and pointed in cement, with half-round hip tiles "kicked" up and flashed up in cement. The windows have solid frames and casements with brick on edge to heads and with the brickwork "running through" at the sills. The storeys are 9ft. high. The tops of door and window architraves are level, with similar mould between forming the picture rail, thus giving an unbroken frieze to all rooms. The walls are 12ins thick, formed of two 4½in. bricks and 3in cavity. The whole of the wood-work inside and out is painted white, the spout and rainwater pipes being finished dul black. The contractors were:—Brickwork etc., Messrs. Doughty and Sons; carpente and joiner work, Messrs. Hudson Bros. tiler, W. Neal; painter, J. H. Hill; all o Middlesbrough. Plumber and gasfitter, etc T. B. Watson and Sons, of Stockton-on-Tees. The whole of the work, includin laying out of the grounds, was carried ou under the supervision of the architect, M James Forbes, 43, Albert Road, Middle brough.

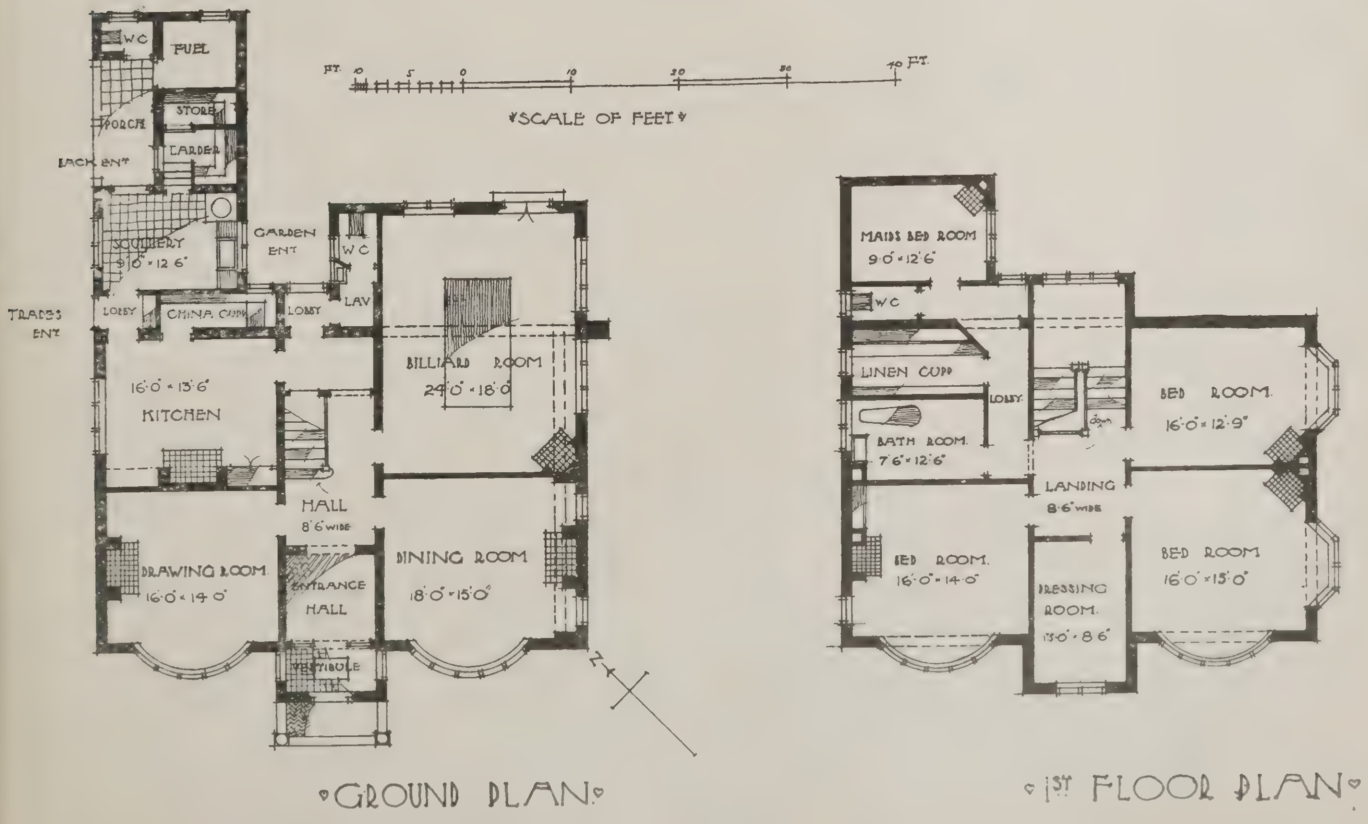

EMMANUEL COLLEGE
CAMBRIDGE
DETAIL OF EAST SIDE
OF QUADRANGLE
SIR CHRISTOPHER WREN : ARCHITECT : 1673 :
MEASURED AND DRAWN BY
W.J. WALKER TODD 1908
N
S
C
B
A
PLAN AT B
PLAN AT C
HALF PLAN OF SOFFIT OF CORNICE
HALF PLAN AT A
℄ LINE OF PEDIMENT
1673
FACE OF CLOCK 1/2" METAL



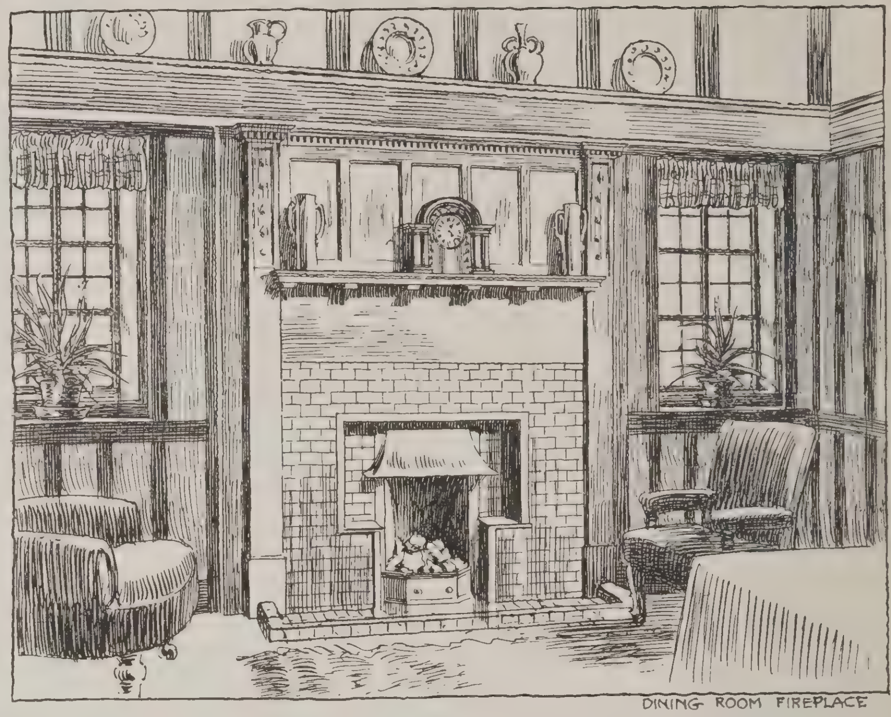
MEASURED AND DRAWN BY W. J. WALKER TODD.



General View.



HOUSE IN THE CLEVELAND DISTRICT, YORKSHIRE. JAMES FORBES, ARCHITECT.



HOUSE IN THE CLEVELAND DISTRICT, YORKSHIRE. JAMES FORBES, ARCHITECT.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Buildings in North Brittany.

PORTSMOUTH.—R. writes: "Spending a week at Paramé, and a second at Granville, what ought one to see in the neighbourhood? And what is the best guide book to that part?"

Paramé is comparatively modern; but St. Malo, which is but two miles distant, offers more of interest in old buildings, if those are in request by the querist. There are many books on Brittany, for which publishers' or library catalogues should be consulted; and as to guide books, either Murray or Baedeker would be found satisfactory.

Pavement for Slaughter-houses.

With reference to the enquiry answered on p. 145, in No. 732, Mr. W. Roland Howell, A.R.I.B.A., of Reading and London, writes:—"About two years ago I had an important slaughter-house to erect, and made exhaustive enquiries as to the best material to use for the floor, and I was convinced by practical slaughtermen that neither asphalte nor any form of concrete *in situ* gave sufficiently good foothold. The slaughtermen were unanimously in favour of York stone, and by selecting a specially hard stone and laying with very fine joints, a floor was obtained which experience has shown to be in every way satisfactory. This may interest your correspondent 'R.C.B.'"

Sea Sand for Concrete.

ST. ANNES-ON-SEA.—"T.E." writes: "The answer to 'A.J.H.'s' query, in your issue of February 24th, concerning sea sand and shingle for concrete, states that these materials possess the merit of being sharp and clean. I should be glad of information where sea sand of a sharp nature is to be found."

If the question is "writ sarkastic," our correspondent has over-reached himself. We would, in turn, like to ask him if he can find any commercial sand that conforms to his interpretation of the word "sharp." All sands have rounded grains, and, even if obtained from a land pit, were deposited by water, and are therefore water-worn. The meaning of the customary expression "sharp and clean" (if either is used singly the meaning of the specification may be disputed) infers that a sand is not to feel soft when rubbed between the fingers, as it would do if greasy or loamy; and that it must not contain any mould, organic matter, mica, clay, loam, or other ingredients that would wash off and become suspended in water.

Adhesive Bond of Reinforcing Bars.

EDINBURGH.—"'BRICK" writes asking for the relative strengths, respectively, of three steel bars, square, spiral or twisted, and round, of equal weight, each 12ins. long and each having a sectional area equal to 1in. by 1in. Also the relative strengths of the same bars placed in the centre of a concrete slab 6ins. square by, say, 2ft. long. This enquiry has reference to the value of adhesion and mechanical bond developed by bars in reinforced concrete. The tests that have been conducted do not give sufficient data to answer with any close degree of accuracy. As regards the first part of the question, if the rods were all of mild steel, their ultimate resistance would be about 64,000lbs., and their elastic limit about 32,000lbs. The adhesion depends upon the nature of the surface, and when the plain rods have rusted before being embedded in concrete they usually pull out only when the elastic limit is exceeded. Consequently, both the square and round rods would probably require 32,000lbs. pull to move them. The twisted bar gives a better hold, as it affords a certain amount of mechanical bond; it also has a greater surface, owing to the greater length of the surface than the axial line. But the tests conducted as to the resistance of twisted bars are by no means conclusive. Apparently, we might allow about 50 per cent. increase of resistance. The twisting of such rods, if done after rolling, increases the ultimate resistance and elastic limit up to about 80,000lbs. and 42,000lbs. respectively.

BIRMINGHAM CLERKS OF WORKS AND BUILDERS' FOREMEN'S ASSOCIATION.

Mr. G. Salway Nicol, A.R.I.B.A., has delivered before members of this association a lecture on "The Great Palaces and Churches of Italy." Mr. Nicol, it will be remembered, was in 1907 awarded the Tite prize by the Royal Institute of British Architects, which enabled him to travel and study in Italy for six months. Mr. Nicol showed a large number of the drawings which he made whilst on his tour in Italy. The lecturer traced the influences that the Renaissance has exercised upon various buildings of later periods. Thus the art of classical Rome, as exemplified in such buildings as the Pantheon, influenced such Renaissance designers as Bramante, Sangallo, and Michael Angelo, whose work in turn directly influenced later buildings, such as the Dome des Invalides in Paris, and St. Paul's Cathedral in London.

Middlesbrough Free Library Committee have decided to adopt the open-access system for the non-fictional part of their proposed new library, the point having been raised by an inquiry received from a firm of London architects.

Architectural Societies.

R.I.B.A.

New Members.

At the business meeting on Monday, March 1st, the following gentlemen were elected members of the Institute.

As Fellows (’.

T. N. Dinwiddy, London; W. R. Howell, Reading; R. Willock, London.

As Associates.

J. Allner, Blandford, Dorset; H. J. Ash, Nuneaton; A. E. Beswick, Swindon; J. E. Bownass, Windermere; E. H. Buckingham, Norwich; F. T. Bush, London; E. S. Coldwell, London; W. A. Daft, Oxford; P. Dalton, Ainsdale, near Southport; H. F. Davies, Chester; W. Dean, St. Leonards-on-Sea; J. L. Denman, Brighton; R. C. Foster, Buckhurst Hill; H. French, London; A. Graham, London; C. Groves, Newcastle-on-Tyne; H. Healey, Rochdale; T. H. Hill, Manchester; T. S. Hosking, Llandrindod Wells; G. E. Hunter, Newcastle-on-Tyne; S. H. H. Ixer, London; H. G. Lay, Wellingborough; W. P. Major, Bristol; S. W. Mobbs, Lowestoft; C. J. Mole, Plymouth; E. Morley, Bradford; S. A. Neave, Sydney, New South Wales; J. T. Penfold, London; F. J. Potter, London; A. W. Ruddle, Peterborough; C. B. Smith, Ipswich; J. B. Surman, Birmingham; W. Sutcliffe, Todmorden; B. H. Sutton, Reading; F. Sykes, Manchester; W. J. M. Thomasson, Bournemouth; R. J. Tyndall, London; R. N. Vanes, London; J. H. Vaughan, Newport, Mon.; F. D. Ward, Hastings; H. G. Warren, London; T. H. Whittaker, Nottingham; W. H. Wilson, Sydney, New South Wales; E. M. Wood, Cardiff.

As Hon. Corresponding Members (2).

Adrien Delpy, architect, Brussels; Charles Louis Girault, Government architect, Paris.

NORTHERN ARCHITECTURAL ASSOCIATION.

A dinner to commemorate the fiftieth anniversary of The Northern Architectural Association was held on February 22nd, at the Grand Assembly Rooms, Newcastle. Mr. G. T. Brown, as president, occupied the chair. Among the seventy members and guests present were Mr. Leonard Stokes (vice-president of the Royal Institute of Architects), Sir George Hare Philipson, Sir Isambard Owen, Mr. E. R. Robson, F.S.A., Mr. Paul Ogden (president of the Manchester Society of Architects), Mr. P. Robinson (president Leeds and Yorkshire Architectural Society), and Mr. Charles S. Errington (hon. sec.).

After the loyal toasts had been honoured, Mr. E. R. Robson gave "The Northern Architectural Association." He said he regarded that meeting to be of exceptional importance, not so much for the great joy arising from a review of the past, but rather as a point of vantage from which to secure greater esprit de corps in the Association to excite among its members themselves a loftier enthusiasm for the art of architecture, and thus to exert greater influence on the public knowledge and taste. Unfortunately, the subject that must above all others engage the attention of the Association was the present deplorable position of the profession throughout the United Kingdom. To such depths had architects at last been relegated in public estimation that competition was invited for the most ordinary buildings, because people found that they could have a hundred or more designs to choose from at almost, sometimes quite, the cost of one. If this was a wise and just treatment of one profession, why should it not be extended to others? Another evil of the competitive system was that the architect had then no client with whom he could confer from time to time as his designs progressed. It occurred to him that competitors should be restricted in number to such an extent that the assessor could really compare every *projet* with every other and thus do justice to all. The assessor should in the first instance see the site and, of course, have a voice in framing the conditions, which should be binding alike on the employer, the competitors, and the assessor. Finally the award of the assessor should not be liable to be upset even by the well-meaning gentlemen who formed the committee and who inaugurated competitions. The President, in responding, spoke of the inauguration of their Association in 1858, and mentioned the names of the 27 founders. Two of these gentlemen, Mr. E. R. Robson and Mr. Haswell, were present with them that evening. The objects of the Association were to promote union among its members, and the elevation of professional architecture, to establish a uniformity of practice, and the general advancement of the art and science of architecture. They had many links at that meeting between the present and the past 50 years. They had present the son of Mr. Thomas Oliver, the first honorary secretary; and the son of Mr. Oswald, who was president in 1880. Mr. F. R. N. Haswell, of North Shields, one of the founders of the Association, spoke a few words regarding its history and work. Sir Isambard Owen gave "The Royal Institute of British Architects and the Allied Societies," which was responded to by Mr. Leonard Stokes, Mr. Paul Ogden, and Mr. P. Robinson. Mr. A. B. Plummer gave "The University of Durham," to which Sir George Hare Philipson responded.

SOCIETY OF ARCHITECTS.

The Society of Architects will hold their twenty-fifth anniversary dinner on Friday, April 23rd, at the Trocadero Restaurant, London, W., at 6.30 p.m., Mr. George E. Bond, J.P., the president, in the chair. The society propose to organise an excursion, open to members and their friends, leaving London on Thursday, May 2th, for Rochester, and going on to Canterbury and thence to Dover on the Saturday, where the week-end will be spent. The Mayor of Dover, Alderman Walter Emden, past-president of the Society, has kindly expressed a wish to entertain the members and facilitate their visits to places of interest. The party will return to town on Tuesday, June 1st. The 1909 regulations and conditions for the design competition for the Society of Architects' travelling studentship (value £25 and a silver medal) have been published. Candidates must be on the society's register of students, and must not be more than twenty-eight years old. The subject is a secondary school, and the drawings must be delivered not later than May 1st, 1909, without name, motto, or other mark of identification, but with a plain sealed envelope attached containing the competitor's signature and address, and the usual declaration. The winner will be required to take a sketching tour of not less than three weeks' duration, between June 1st and October 1st. The qualifying examination for membership will be held in London and Manchester on April 6th, 7th, and 8th, and also at Oxford and other centres, provided the entries are sufficient in any one district; the entries closing on March 22nd. The entires for the architectural scholarship of £10 close on April 1st, and the examination is to be held on Monday, April 5th.

DEVON AND EXETER ARCHITECTURAL SOCIETY.

The annual meeting of the members of the Devon and Exeter Architectural Society (embracing the counties of Devon and Cornwall) was held at the Central Hotel, Plymouth, recently, the president, Mr. James Crocker, F.R.I.B.A., of Exeter, in the chair.

The hon. secretary presented the annual report, from which it appears that the membership is now eighty-five.

The following members constitute the officers and council for the ensuing year, viz., Mr. W. H. May, M.S.A. (Plymouth), president; Mr. Charles Cole, M.S.A. (Exeter), vice-president; Messrs. M. Alton Bazeley (Plymouth), James Crocker, F.R.I.B.A., John M. Pinn, T. A. Andrews, J. A. Lucas, A.R.I.B.A., O. Ralling (Exeter), C. Cheverton, M.S.A. (Devonport), J. C. Southcombe (Barnstaple); S. Dobell, hon. treasurer (Exeter); and Allan J. Pinn, A.R.I.B.A., hon. secretary (Exeter).

Votes of thanks were accorded to the retiring president, and to the hon. secretary.

The meeting was followed by a luncheon, at which a short toast list was gone through.

Law Cases.

Architect's Liability for Materials Ordered.

At the Somerset Assizes, on March 1st, the Ham Hill and Doulting Stone Company, Ltd., of Yeovil, sued William Beddoe Rees, architect, of Cardiff; the Rev. Wm. Thomas, minister of the Tabor Calvinistic Methodist Chapel at Maestag, South Wales; and Messrs. W. G. Roberts and Thomas Morgan, members of the Building Committee of that chapel, the object of the action being to recover £196, balance of account due for stone supplied. Mr. J. Alderson Foote, K.C., and Mr. C. A. S. Garland were for the plaintiffs, Mr. Clavell Salter, K.C., M.P., and Mr. Hickman appeared for Mr. Beddoe Rees, and Mr. Holman Gregory was for the Rev. W. Thomas and Messrs. Roberts and Morgan.

Mr. Foote said the action was simply on the question as to who was responsible to the plaintiffs for payment for the stone which they supplied. He did not think, after the correspondence which had taken place had been read, any evidence would be necessary, as the matter turned almost entirely on the correspondence. The action was originally brought against Mr. W. Beddoe Rees for the price of stone supplied, but Mr. Rees pleaded that he had only contracted as agent for the building committee, which consisted of 200 or 300 people, being the whole of the male members of the chapel. Eventually Mr. Rees gave the names of three of them, and said he could not possibly give any more. Thereupon plaintiffs added these three. They now appeared, and denied that they had authorised Mr. Rees, the architect.—Mr. Salter: We say that Mr. Rees, if he bought the stone, bought it on behalf of the committee, but we deny that he bought the stone at all.—Mr. Foote contended that if Mr. Rees signed the contract for the stone in his own name, without naming the principals, he was liable, unless there was something in his letters saying that he should not be liable. The correspondence, Mr. Foote added, was of terrific length, and it would take him a long time to get through it, but there was nothing else in the case. There was no dispute as to quality or quantity. The only question was as to who contracted. —Mr. Gregory said that Mr. Rees was architect, and was agent for the committee for certain things, but the question was whether he was agent for getting this stone. He had no authority from the building committee to make a personal contract for the supply of stone, because the committee had arranged a lump-sum contract with the builder.—Mr. Foote then occupied about two hours in reading the correspondence, which extended to nearly 400 letters.—In the written defence put in on behalf of Mr. Beddoe Rees, he denied that the stone was sold to him, and he did not admit that he ordered from the plaintiffs at all, or that he entered into an agreement with them. In the alternative, he said that if he gave the plaintiffs any order—which was not admitted—he did so as architect or agent for the building committee for the supply of stone to the contractor, and not to the defendants.—Mr. Clavell Salter submitted that not only had the plaintiffs failed to prove that Mr. Rees made himself responsible for payment out of his personal pocket for this stone, but a great number of the letters made it perfectly clear that the plaintiffs understood that, as far as Mr. Rees was concerned, his position was only that of architect. It was a question of fact upon the whole correspondence for his lordship to decide whether or not Mr. Rees contracted for a disclosed principal, and Mr. Salter submitted that throughout the whole business Mr. Rees contracted as agent, and for a disclosed principal—the building committee.—His lordship said he thought Mr. Rees made himself liable by saying, "I accept this," and not saying that he accepted it on behalf of someone else.—Mr. William Beddoe Rees then gave evidence, and said he advised Mr. Staples, plaintiffs' representative, in the course of an interview, to get the order from the builder, because the money would pass through him in the usual way; and he agreed to do it, and also agreed to the arrangement that the money should pass through the builder.—His Lordship (to Mr. Rees): But you made the contract in your own name?—Mr. Rees: But Mr. Staples knew.—His Lordship: It doesn't matter if he did know. There is a similar case pending in London now.—Mr. Gregory submitted that there was no evidence against his clients. Messrs. Thomas, Roberts, and Morgan.—Mr. Foote thereupon elected to proceed against Mr. Rees only, and asked for judgment against him.—The learned Judge said the main question was whether Mr. Beddoe Rees was liable upon the contract for the supply of this stone, and he was of opinion that he was so liable. The principle had been properly stated by the learned counsel on both sides, but the question was the proper application of it. He came to the conclusion that the plaintiffs were entitled to recover, and he therefore gave judgment for the plaintiffs, with costs, against Mr. Beddoe Rees. He would enter judgment with costs in favour of the three co-defendants, Messrs. Thomas, Roberts, and Morgan; but he reserved his decision on the question whether their costs should be paid by Mr. Beddoe Rees.

Borough Surveyor's Death from Septic Poisoning: No Compensation.

A somewhat novel point under the Workmen's Compensation Act has been decided by his Honour, Judge Ingham, at the Evesham County Court. An application for compensation was made by Mrs. Gertrude Amelia Mawson, of Victoria Avenue, Evesham, by reason of the death of her husband, Robert Collett Mawson, borough surveyor, who died on April 20th, 1908. The defendants were the mayor, aldermen, and citizens of Evesham.—Mr. Cotes-Preedy appeared for the applicant, Mr. E. W. Cave for the respondents.—Mr.

Cotes-Preedy stated that the deceased, who had a salary of £190 per annum, was 51 years of age when he died, had been 25 years in the employment of the Evesham Borough Council, and left a widow and two children. In January, 1908, it was decided to clean out a pond in the recreation ground. It had not been cleaned for some years, and apparently had been the rubbish pit for the town, as it contained cats, dogs, vegetable matter, and tin cans, the stench from it being extremely bad. The deceased had to superintend the work, which had been entrusted to a man named Clements. Mawson, a few days after commencing the work, complained to his wife of feeling ill, and, in addition, had the misfortune to slip into the pond up to his knees. He got steadily worse, and went to a doctor on March 5th.—The witness Clements stated that he had had considerable experience with drains and ponds, but had never smelt such a stench as emitted from the pool.—Dr. Gordon Evans gave evidence, and stated that Mawson suffered from laryngeal and faucial ulcerations due to septic poisoning, produced by micrococci inhaled from some virulent source. Judging from the patient's condition, he was of opinion that the invasion of the disease must have commenced not more than two months and not less than three weeks before he first saw him.—His Honour dismissed the application, with costs, considering that the point was governed by Broderick v. London County Council, in which case the Court of Appeal had held that a workman employed in sewers, and who developed enteritis, could not recover compensation.

A Falling Wall: Damages Against Contractor.

At the West Riding Assizes at Leeds, on February 23rd, Mr. Justice Coleridge heard a claim by Sydney Hill, of Andrew Street, Sheffield, against Messrs. Henry Boot and Son, contractors, Sheffield, for personal injuries received. Plaintiff, who claimed through his father, was represented by Mr. T. E. Ellison (instructed by Mr. J. E. Wing, Sheffield), and defendants were represented by Mr. Scott Fox (instructed by Messrs. Branson and Son, Sheffield).—Mr. Ellison stated that the plaintiff received the injuries on October 12th last year. He was only fourteen years of age, and as a result of the injuries received he had had to have one of his legs amputated. A building was being pulled down by the defendants, and plaintiff, who was playing with other boys near by, was struck by débris. He was removed to the hospital, and amputation was found necessary.—Sydney Hill was called, and had to be assisted into the witness-box. He said that on October 12th he and some more boys were playing in Andrew Lane, near his home. He dropped a stick he was carrying, and when he stooped to pick it up he was knocked down by the wall, which fell on him. He had never been warned not to play near the building.—Albert Edward Marshall said he saw the piece of wall fall on the boy. He helped to take him to the hospital. There was no opening in the hoarding near to where the boy was struck. —Police-Constable Bainbridge said he made inquiries at the building immediately after the accident. He saw a gentleman named Boot, who gave the name of Henry Boot and Son, Moor Street, Sheffield. Nobody suggested to him that any blame was attached to the boy, but the foreman said the boys had been picking up sticks all the morning. —John Lancashire, surveyor, Hartshead, said the road was 14ft. wide from building to building. In his opinion the method of pulling down the building was perfectly safe if people were not about.—Albert Green, a Corporation official, cross-examined by Mr. Scott Fox, said, with regard to the narrowness of the roadway, it would not have been possible to erect a covered footway alongside the hoarding.—Ernest Kemp, joiner, said he saw the lad Hill inside the hoarding early in the morning, and told him to clear out. The boys were always running in and out.—Arthur Thomas Smith, general manager for Messrs. Boot and Son, said he had been specially requested by Mr. Green and Mr. Sims not to erect a canopy over the footway beside the hoarding, on account of complaints that had been made by someone who carried on business in the lane.—George Crackell, the foreman, said no matter how the wall had been taken down, there might have been danger to passers-by.—Mr. Nixon, veterinary surgeon, said that he had told the lad that morning not to gather sticks near the hoarding. The lad was impudent to him, and flung a piece of brick at him.—A scaffolder named Mara said he had heard the watchman warn plaintiff of the danger. He told him to go away, or he would throw half a brick at him.—Mr. Ellison submitted that if proper precautions had been taken the accident would not have happened.—His Lordship said he did not think the warning given was calculated to impress upon the boys what the danger really was. Apart from this, there was a doubt whether proper precautions had been taken with regard to the hoarding. Taking the whole case into consideration, he thought plaintiff had succeeded.—With regard to compensation, he thought £130 would be an adequate amount, though he wished he had had a jury to aid him in his assessment.

DESIGN AND CRAFT IN ENGLISH WOODWORK.

Prof. Beresford Pite delivered a fascinating lecture on "Design and Craft in English Woodwork," at the Carpenters' Hall, the chairman being Mr. T. G. Jackson, R.A. Professor Beresford Pite began by stating that woodwork is in many cases the basis of stone architecture. He briefly dealt with the wooden architecture of the Mycæneans which underlays the art of the Greeks and Romans, and passing on said that we can discern in early Egyptian architecture, the character of which is so clearly in our minds, an origin related to the reed and mud architecture of the Nile valley. Recognising the trabeated or "beam" style of ancient wooden architecture, the mind recognises how useful wood is in building. Both Egypt and Greece were stone-producing and stone-building countries, yet each derived its stone architecture from wooden ideals. Stone, he said, in itself, does not yield a significant type of architecture; for instance, we have had Stonehenge in our midst for centuries. It stands as a relic of a stone-building age, but has had no descendants, and has produced no school. The wood-producing countries of Scandinavia and Northern Europe have produced no lasting wooden art. The lecturer next drew attention to a remarkable survival of Saxon wooden architecture, within easy reach of London, namely, Greenstead Church, near Ongar, in Essex. This was built as a temporary chapel, in which the body of King Edmund the Martyr (who had been murdered by the Danes) was deposited for one night, while being translated from London to Bury St. Edmunds. The walls are formed of upright wooden logs, roughly adzed on one side, put close together, the outside being left in the natural state. English architecture started from the year 1000, and until the advent of the Renaissance, it was essentially a *stone* architecture, the mason's art was paramount. There were many remains of Roman architecture in England in the 4th and 5th centuries, but the whole of this work seems to have been disregarded, for we still find examples of Saxon art in the 5th century. With the advent of the Normans came a vigorous art from Caen. There is no Norman building in this country more expressive and more important than the Tower of London, more expressive because it is one of the few buildings which still fulfils its purpose. By the 13th century, he said, we have a marked English masons' art. During the 500 years since A.D. 1000, the architecture of England shows a more complete grasp of the subject than any other period succeeding the Conquest. As an example of 14th century work, he mentioned the triforium of Westminster Abbey, and drew attention to the fact that this fully-developed style had been produced by English masons in 200 years from the Norman Conquest.

During this period there were two main streams of architecture, (1) military, (2) ecclesiastic. The domestic work was of an inferior character, and where it existed was probably half-timbered work. All through this period, with the exception of the domestic work, carpentry follows masonry. Although it has its own utility and its own purposes, yet it derives all its forms from masonry. He illustrated this by means of examples of 13th and 14th century woodwork, the carving on which was a direct copy of stone forms of the period. The choir stalls at Winchester Cathedral were shown as examples of 13th century work, and the lecturer drew attention to the similarity between the canopies over these and the stone ones on the tomb of Aymer de Valance, in Westminster Abbey. They were, he said, an exceedingly skilful adaptation of the stonework of the day, but nothing more. The stalls of Henry VII.'s chapel at Westminster show a departure from recognised Gothic methods; the carpenter was evidently shaking himself free from stonework traditions, and so we come down to the Reformation. The lecturer next dealt briefly with the wonderful roofs of the period, particular attention being paid to those in London, the roof over Westminster Hall, he cited as the finest example of a mediæval roof in the world, having a span of 68 ft., the length being 240 ft. Passing on to porches, several examples of which were shown, he pointed out that the framing was carpentry pure and simple, but that where any filling-in was required, stonework forms were blindly copied. Half-timber work was briefly dealt with, and slides were shown of Old Moreton Hall, Staple Inn, Holborn, and the front of Sir Paul Pindar's house, now in South Kensington Museum. During this period, he asked, what had been happening to the wood-carving? The 13th century wood-carving was interesting as showing a strict adherence to stonework forms. In the 14th century, however, we find the character of the work altering. The carver is of necessity a more independent character, and less subject to tradition than the ordinary joiner; and so his work bears earlier evidence of the change.

Some examples of linen panelling were shown, which, the lecturer remarked were very interesting and very suggestive. The walls of the houses were, in the Middle Ages hung with fine tapestry, and these forms were produced by the joiner in his wood. The advent of the Renaissance in the 16th century, said the lecturer, created an enormous interest in woodwork. The screen from King's College Chapel, Cambridge, was instanced as being the most extraordinary and the most beautiful piece of woodwork in Europe. Mr. Gotch compares the woodwork of this screen with the Hall of Wolsey's Palace, Hampton Court, and suggests that the same workmen were employed on both, but the lecturer expressed himself of the opinion that the design was obviously based on a marble treatment, and was probably the work of an advanced Italian architect. Passing on to staircases, several examples of which were shown, including one from a house in Great St. Helens, 1646, and the grand staircase, Thorpe Hall, the lecturer drew attention to the hugeness of the framing and the great newels. In the choir stalls at St. Paul's, designed by Wren, and executed by Gibbons, he said, we see that nothing has grown out of tradition; they are a fine original effort of design in woodwork, while the screen at the back of the stalls shows a fully developed evolution of classic styles in woodwork. Finally a wooden doorway from Abingdon House was illustrated, with Doric columns on either side, and the lecturer remarked in conclusion that he had now "boxed the compass," and arrived back at the point from which he started.

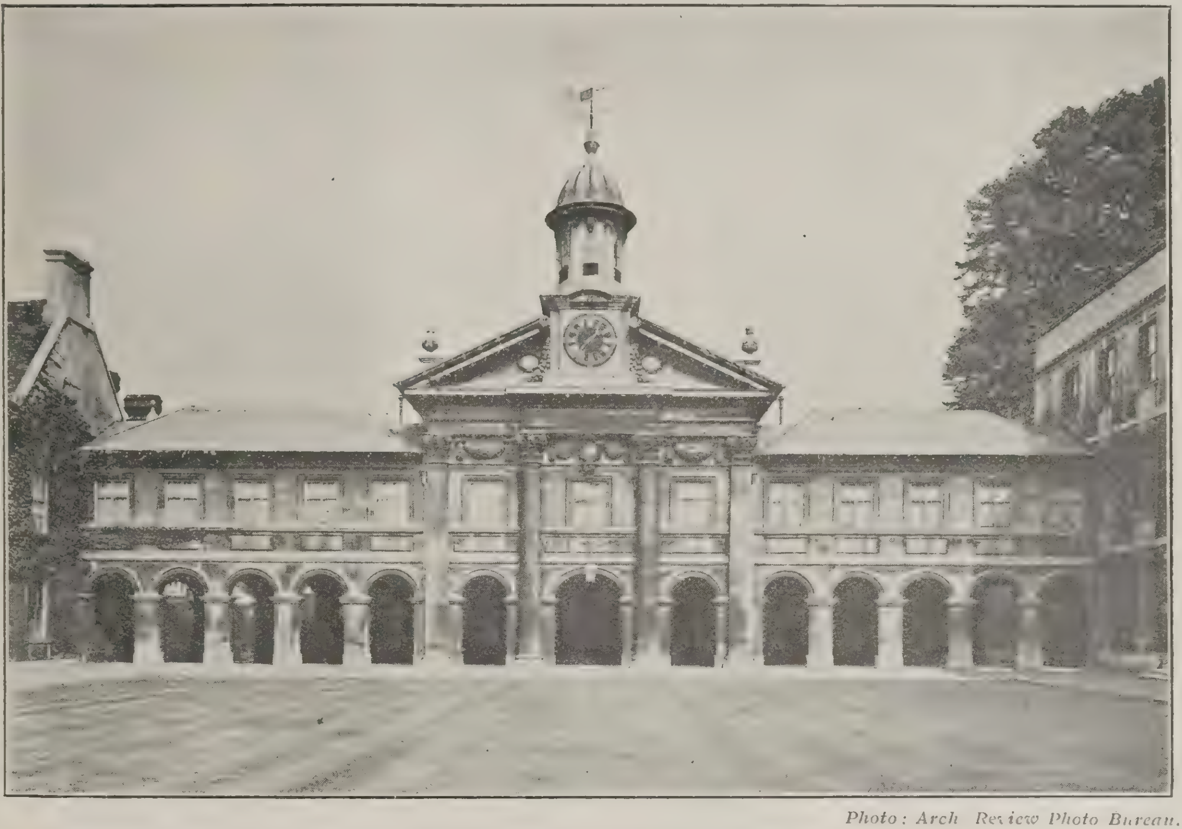


Photo: Arch Review Photo Bureau.

EMMANUEL COLLEGE, CAMBRIDGE. CHAPEL AND ARCADE. (*See Centre Plate*).

THE NEW LONDON BUILDING REGULATIONS.

In the House of Commons on March 11th, an animated discussion took place upon the second reading of the London County Council General Powers Bill, Mr. Molteno, referring to the proposed alteration of the London Buildings Acts, said that a great additional burden was going to be placed upon those engaged in building in London. The laws were complicated, and the object of the new rules was to facilitate building with ferro-concrete and reinforced concrete, which could now only be used in addition to other walls. But the Bill, when drafted, was found to contain most minute and rigid rules applying not only to the wall, but to internal portions of the structure. The public interest was already secured by regulations as to external walls, and nothing had occurred to justify the proposed change. All the technical authorities agreed that the scope of the Bill should be limited to the enclosing and party walls, but this proposal was rejected by the County Council. The additional cost of the proposal must be very heavy, the district surveyors having pointed out that it would increase their work fourfold, and naturally they would require a fourfold fee. There were 400 persons on the technical staff of the L.C.C. architects' department, and if the proposal passed there would be 600. He protested against the Bill going to a committee, and causing heavy expense to the community and those who opposed the Bill. He pointed out that the building trade was already sufficiently depressed, and that all that was required was to amend the present Building Acts so far as reinforced concrete was concerned.

Mr. H. C. Gooch said the change proposed by the Bill was necessitated by the new style of building construction—that was to say, going from brickwork to skeleton ironwork. With skeleton ironwork they must control the interior as well as the exterior portion. If people objected to the new method nothing would prevent their putting up buildings in the old fashion. With regard to the conference with the various experts, seventeen out of twenty points were conceded to them. It was thought better to set out clearly in the Bill the various technical matters referred to.

Mr. Vivian said that it was absolutely impossible to conduct building operations with a clause of this sort. There could not be the requisite speed. In large building enterprises no such details were attempted. The selection of the County Council to listen to appeals from its own decisions was a perfect farce.

Earl Winterton suggested that the appeal authority should be composed of three members—one nominated by the Secretary of State, one by the Surveyors' Institute, and the third by the Society of Arts.

Mr. John Burns, intervening, said he was assured by members of the London County Council who were in the House that the questions referred to would receive sympathetic and serious consideration when the matter came before the Committee. He hoped the second reading would be agreed to. He wanted to see greater elasticity given to an industry which was already depressed, and which had a right to adapt itself to modern ideas of new construction. If the Bill was not passed, its rejection was going to damage building.

Mr. B. S. Straus pointed out that the appeal was not from the Council to the Council, but from the district surveyor to the Council.

Mr. Waterlow remarked that the district surveyor was not the servant of the County Council. He was not paid by the Council, but by fees under the London Building Act. He was appointed by the Council, but they could not dismiss him. He was practically appointed for life, except in the case of gross misbehaviour. The proposed appeal was from a statutory servant to the County Council. The question of the tribunal could, however, be decided by the Committee. Subclause 29 was to enable skeleton steel structures to be put up. At present they could not build them except under the Building Act, which, if they had a wall 80ft. high, necessitated their putting in the lower part of the walls 2ft. 6ins. thick, although they might be carrying the whole weight of the structure on the steel construction. That was an enormous additional cost. The object of the clauses was to enable the new system to be used economically, which it could not be at present. The system had to be supervised, and the district surveyor was obviously the right person in the first instance. The committee, after hearing technical evidence, must settle the extent of the detail to be submitted to the district surveyor.

Mr. Stephen Collins said the Royal Institute of British Architects and the various other bodies were as anxious as honourable members were for the safety and good construction of building. But in these times when the building trade was so bad, and unemployment rife, they should be careful before passing vexatious rules and laws which would hinder the trade.

In the course of further discussion, Mr. W. Guinness said it had been agreed to drop the one month's notice provided under subsection 29. Only two days' notice should be necessary at the beginning of the building under section 145 of the Act of 1894.

Mr. Courtenay Warner did not think that in that case the Bill could do the building trade much harm.

The Bill was read a second time.

In Germany, a new law has lately come into force making it an offence for a man to describe himself as a builder unless he is certified to be a "State builder." This term includes architects and engineers, but not carpenters or masons, who, when fully qualified, are described as master carpenter and master mason. Although the distinct professions of architect and engineer are not specified for registration by the State, the law is severe on people who, without being qualified, describe themselves as belonging to either of these two professions. Actions at law may be brought against unqualified men by those who are qualified, and whose professional work has been injured by the competition of the unqualified. Already there is a good deal of grumbling among the professional men in Germany at an unsatisfactory feature of the new law, for it has been found that no grievance lies against the unqualified architect unless he competes with his qualified brother professional.

SWEATED INDUSTRIES BILL.

Second Reading, House of Commons, Friday, 26th March, 1909, 1st Order.

This measure is identical with that introduced by Mr. Toulmin last year and referred to the Home Industries Committee.

The latter reported the Bill to the House without detailed comment. The second reading is proposed to be taken on March 26th, 1909. The Bill is for the moment intended to apply to the Tailoring, Dressmaking, and Skirtmaking Industries. Under the Sweated Industries Bill, clause 2, sub-section 1, a trade union or trades council, or any six individuals of any trade in any district, may apply for a Wages Board to be established in any industry. At present certain industries have established voluntary Boards of Conciliation for the settlement of the minimum rates of wages for persons therein engaged. Such voluntary agencies are effective because the parties respectively realise that, unless a spirit of fair compromise animates the deliberation of the parties, a peaceful solution is unlikely, and a fight on the question may be long and costly. Such voluntary agencies only affect, however, the members of the organisations concerned, generally the trade union on one side and the association of employers on the other. These two, however, rarely represent even a majority of employers or workmen of the district in the trade or trades concerned, so that a large number on both sides are not bound by any decision as to wages, although they may be, and generally are, influenced by it to a considerable extent.

The decisions of a Wages Board under the Act would then affect every workman and employer in the district, whether associated or not.

What is likely now to be the attitude of these various parties after this Bill becomes Law?

The associated employers may think that the machinery of the Bill affords them an opportunity to compel every non-associated employer to pay a certain minimum wage to be fixed by the Wages Board, and they may therefore be in favour of abolishing the voluntary Conciliation Boards. The trades union members may similarly think to abolish the competition of the non-union workmen who sometimes underbid them, and also desire the abolition of the voluntary Boards.

Where neither of these parties take these views, the non-union workmen may think the formation of a Board under the Act would enable them to obtain nearly the same advantages as those now obtained by the union men, without the expense of paying to a trade union, and may apply for a Wages Board themselves. Non-associated employers may consider the main advantages of association are gone when a Wages Board has been established; and even associated employers and trades union members may share this view and withdraw from their respective organisations.

It is apparent, therefore, that for various motives all parties may be disposed to apply for a Wages Board to be established for any trade, and the Bill proposes to give the Home Secretary power to extend the operation of the Act to any trade whatever.

It is likely, therefore, that if the Bill becomes Law in its present form it will profoundly affect all existing trades unions and associations of employers.

There are also many questions which cause disputes between employers and employed besides the wages question, and it is to be expected that there will be a strong tendency to extend the jurisdiction of the Wages Boards to these other questions, especially in respect to disputes arising between non-associated employers and workmen. Once a minimum rate is established, all future questions involving a raising or lowering of this rate will have to be decided by the Wages Boards.

Clause 3, sub-section 1, provides that the Board shall consist of a chairman and not less than six and not more than ten other members, as the Secretary of State may decide. Sub-section 2 provides that one half of the other members shall be representative of employers, and one half representative of employed in the trade in the district. The term district means any local area, whether county, borough, part of a county, or part of a borough, within the discretion of the Secretary of State.

Clause 7, sub-section 1, provides that any determination of a Wages Board may be made by *a majority of members present.*

Sub-section 2 provides that the Secretary of State, when determining the number of members of a Wages Board, shall determine what number, not being more than one half of the total number of members, shall form a quorum, *but the formation of a quorum shall not depend on the presence of any number or proportion of representatives either of employers or of persons employed.*

Consider the effect of these sections 1 and 2 of clauses 3 and 7. Suppose the Secretary of State decides on 6 as the number of members for a Board, 3 would have to be employers and 3 workmen. Suppose he fixes the quorum at 3, which is the largest number he can fix it at. Then, under these sections, a board consisting of a chairman, two workmen, and one employer or a chairman, one workman and two employers, could fix the rate of wages for a district such as Liverpool or Manchester or Birmingham, or even London.

Decisions under section 1, clause 7, would be carried by a majority of those present. The absence from any cause of one employer or one workman might cause the decision to vary against one party or the other most unfairly, and yet every employer or workman in a district like London would be bound by the decision.

Suppose, again, the full Board of six attended the meeting, and the three employers voted solidly in favour of one course, and the three workmen voted solidly against it. How is a decision to be arrived at?

Nothing is said in the Bill as to the chairman having a casting vote.

Is the result then to be a deadlock, and no decision to be arrived at? or is the chairman to decide the question himself? If the former, then a deadlock is often likely to arise, in practice, and would reduce the Act to absurdity; if the latter, then one man will in a large number of cases decide a question affecting a large number of employers and employed.

Again, this one man, the chairman, will probably be a person quite unconnected with the trade in question, and the ultimate result, therefore, is that an outsider determines the wages rate for all the employers and employed in a district like Liverpool or Manchester or London, without any practical knowledge of the matters under decision, and without any responsibility for any hardship which may result, and without being himself at all affected by the results of his decision.

And, bear in mind, his decision must be obeyed under penalty of fine; there is no appeal.

Clause 8, sub-section 3, provides that any person guilty of an offence against this Act shall be liable on a first conviction to a fine of £1 to £5, and for a second or subsequent conviction within two years to a fine of £2 to £20 for each offence.

The intention is quite clear as regards employers who offend, but it is seriously meant that where a trades union declines to abide by a decision this penalty is to be inflicted, and if so could it be inflicted in view of the Trades Disputes Act, and is it to be inflicted against every member of the union, or merely against the union considered as one person?

It looks as though the effect of the establishment of a Wages Board for any trade would be to abolish the right of strike or lock-out for the workmen and employers of that trade. Surely this is not a result contemplated by the unions, who have hitherto always declined to be parties to any scheme of compulsory arbitration.

Then there is the question of varying decisions of Wages Boards in contiguous areas. Take the case of the London boroughs, about 28 in number; suppose any trade exercised in the majority of these boroughs applies in each of them for a Wages Board and obtains its request. The rates of wages fixed by these Boards might vary in contiguous boroughs, with the result that employers on one side of a street might be paying a higher rate than those on the opposite side, for identical work, with the result that those paying the higher rate are penalised and possibly constrained to move into the lower paid district.

The tendency of conciliation schemes on the contrary is to equalise the wages for similar kinds of work in all districts, and for any variation to affect all districts alike, as for example the recent scheme adopted in the shipbuilding industry.

As regards the building trade it may be thought that the points which have been thus far discussed are not likely to affect that trade, but this is by no means sure.

Wages for skilled artisans in identical branches of the trade range from 6d. to 11d. per hour, and it is extremely likely that in the lower paid districts an attempt would be made to have Wages Boards established for the purpose of levelling up this difference quite apart from the general considerations referred to at the beginning of these observations.

Enough has been said, we think, to show that this measure is one of far-reaching importance, especially to those industries which have set up voluntary agencies for the settlement of disputes; and the Bill ought not to be allowed to pass without the most searching criticism, and the provision of suitable amendments safeguarding such voluntary agencies.

At a special meeting of the committee of the Hereford Co-operative Housing, Ltd., held recently, Messrs. Groome and Bettington, architects, were instructed to accept the tender of Messrs. W. P. Lewis and Co., Hereford, for the building of twenty cottages on the site near Barrs Court station.

* * *

The "Koh-i-Noor Pencil Calendar," issued by Messrs. L. and C. Hardtmuth, is exceedingly handy for office use. It is a box-form "perpetual" calendar, constructed of cardboard, the dates being changed by a twist of the rollers upon which they are wound. Messrs. Hardtmuth may be congratulated on their adoption of a happy idea for the advertisement of their famous pencils.

* * *

From December 11, 1905, up to December 31, 1908, the Local Government Board have held 132 inquiries in connection with housing schemes, and have sanctioned ninety-eight loans, representing a total of £572,443. The largest loans were: Sheffield, £46,100; Liverpool, £58,000; Hornsey, £45,300; Bradford, £43,668; Manchester, £38,100; Leeds, £34,680; Richmond, £30,400; Swansea, £30,990; and Sunderland, £29,633.

* * *

A point in town planning is suggested by a writer in an Uxbridge newspaper. The present appearance of the local development at Hayes Station, and also around West Drayton Station, has given him the idea. At the first-named place, the factories as yet are fortunately all on one side of the railway, and on the other side there is springing up quite an attractive colony of dwelling-houses. Why not keep up this distribution? In this nerve-distracting age it is no joke, even to a workman, to live in the midst of the noise and clatter of factories in active operation, and it would certainly be to the interest of the employers, as well as to the comfort and physical welfare of the employees, if the place of work and the place of residence could be thus nicely separated. The same applies to West Drayton, which might be retained as the residential quarter, and to Yiewsley, which might be more consistently made use of as the workshop.

FIRE-RESISTING CONSTRUCTION SECTION.

(MONTHLY.)

TEST OF A REINFORCED TERRA COTTA COLUMN.

There was recently tested at Phœnixville, Pa., a reinforced terra cotta column, 21ft. 7½ in. long and 21¾ in. in diameter, which was subjected to a maximum load of 4,109 lbs. per square inch, and, according to the report of Robert W. Hunt and Co., of Chicago, who made the test, was not injured.

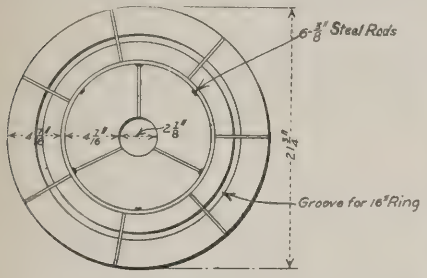


FIG. I. SECTION OF REINFORCED TERRA COTTA COLUMN.

The column was built of special shaped, hard burned, terra cotta tile, composed of two concentric rings, the inner one of three and the outer seven tiles. The vertical reinforcement of six ⅜in. steel rods was placed in the circular joint between the inner and outer rings.

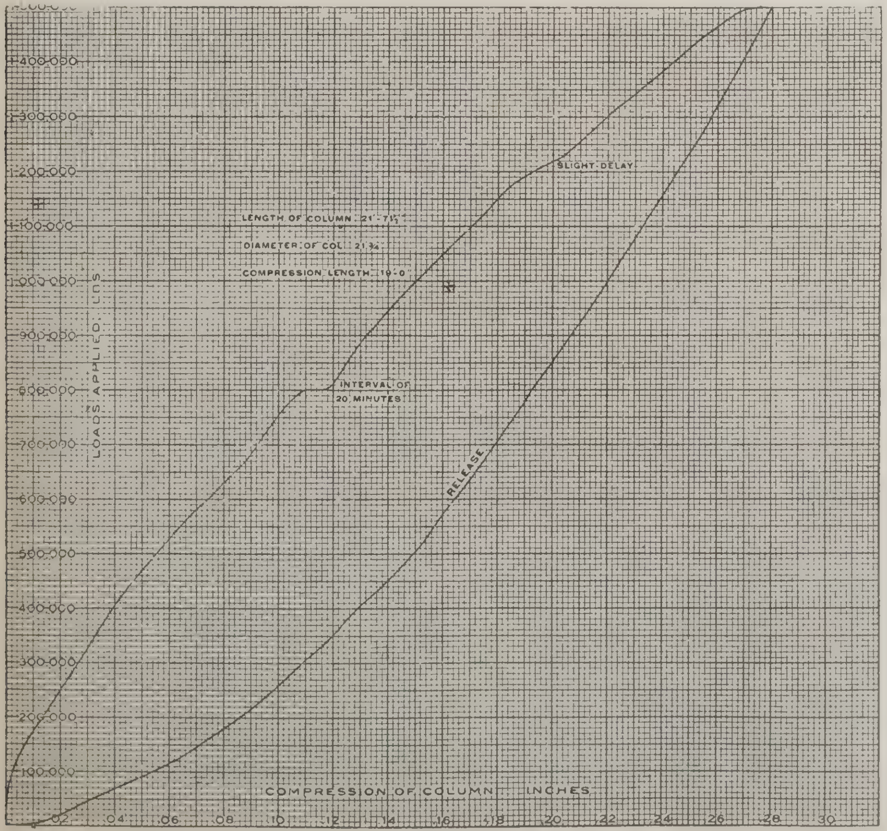
The column was built of 106 courses of tile, each approximately 2¼ in. thick, and containing in the other ring a 1-in. circular groove, ¼ in. deep, in which was placed a welded ring of 3-16-in. wire, 16 in. in diameter. Through the centre of the column was a 2 ⅞-in. hole. The mortar in the horizontal joints was one part Portland cement, one part torpedo sand, and one part fine sand. In the first seven courses the mortar in the vertical joints was one part Portland cement and three parts torpedo sand. In the vertical joints of the remaining courses the mortar was of the same proportions as in the horizontal joints, with, however, the addition of 7 to 10 per cent. plaster of Paris in the outer ring, added to make a stiff and quick setting mortar. All joints were ¼ in. thick. A cross section of the column is shown in a sketch reproduced herewith.

Samples of the materials entering the column were tested. The steel samples showed elastic limits of 67,430 and 71,390 lbs. per square inch, respectively; the wire for the rings, elastic limit, 48,900 and 51,780 lbs. per square inch; half tiles, crushing load, from 10,000 to 12,338 lbs. per square inch; full-size tiles were tested to the capacity of the machine without crushing, amounting to 8,812 and 9,066 lbs. for the two specimens.

The column was shipped to Phœnixville from Chicago on an ordinary flat car in the early part of November, arrived in good condition, and was tested in a horizontal position on November 10, 1908. The compression curves for loading and release are shown herewith.

The load was run up to 800,000 lbs. in 19 minutes, taking readings at each 25,000 lbs. lb. increment. A stop was then made for examination, and upon resuming the remaining load of 700,000 lbs. was applied in 10 minutes, taking readings at each 25,000 lbs. increment above 1,200,000 lbs. At the maximum load of 1,500,000 lbs. the compression in the 19-ft. length between points of measurement was 0.27 in., increasing to 0.28 after the elapse of a minute. The load was then rapidly released, dropping to 50,000 lbs., and a compression of 0.032 in. in 10 minutes. Five minutes later, with no load, the compression was 0.010 in., and after the elapse of 20 minutes more the compression was 0.006 in. Since the cross section of the column is 365.051 sq. in. the maximum load was 4,109 lbs. per square inch.

An examination showed that the column was unharmed. At a point 6 ft. 4 in. from the top end a slight scale, at points on opposite sides of the column, had fallen from three different tiles. These had a maximum diameter of ¾ in., were less than 1-32 in. thick, and consisted of the outside glazing. There was absolutely no sign of failure, the report of the testing engineers states, in the tiles or in the joints.



REINFORCED TERRA COTTA COLUMN. COMPRESSION CURVES FOR LOADING AND RELEASE.

L.G.B. AND A FIRE DANGER.

The guardians of the poor of the Kingston Union were summoned at Kingston for erecting additional workhouse buildings in the district of the Maldens and Coombe Urban District Council which were an infringement of the building by-laws of that Council.—It was stated on behalf of the Maldens Council that the buildings were constructed of wood, and that there was, therefore, a great danger of fire.—Mr. Macmorran, K.C., on behalf of the guardians, said the buildings were erected only as a temporary measure to relieve the overcrowding at the Kingston Workhouse, pending the report of the Royal Commission on the Poor Law, which might render a costly new workhouse useless. He also reminded the Bench that the Local Government Board had offered a way out of the difficulty by proposing to sanction a special by-law which would exempt the buildings from the operation of the by-laws of the Maldens Council, and that this special by-law the Maldens Council had refused to accept. Had this offer been taken, the Court would have been spared the lamentable spectacle of two public bodies fighting each other. He also pointed out that there were 140 poor people now being accommodated in the buildings, and that if the guardians were convicted the buildings would have to be pulled down. The Bench decided to dismiss the summons.—Mr. A. C. Mackenzie asked the Bench to state the reasons upon which the summons was dismissed.—The chairman declined to do this, and stated that if the Bench gave an opinion of the action of the Maldens Council in the matter they would have to use some very strong expressions.

NATIONAL FIRE BRIGADES UNION.

The Duke of Marlborough presided at the annual dinner of the National Fire Brigades Union, which was held at the Holborn Restaurant on March 10th. There was a large attendance, among those present being Captain Hamilton, chief officer, and Mr. Gamble, Lieutenant Sladen, and Mr. A. Dyer, divisional officers, of the London Fire Brigade, Lieutenant-Colonel Fox, chief officer of the London Salvage Corps, Lieutenant-Colonel Seabroke, Surgeon-Major Maitland Coffin, Mr. Guy Pym, M. Kusel, representing the Italian and Belgian Fire Federation, and many chief officers and other representatives of fire brigades in various parts of England and Wales. Mr. Guy Pym, in proposing the toast of the evening, said that the union now comprised 650 brigades, with an aggregate membership of over 13,000 men. The Duke of Marlborough, in responding, observed that the union had that day attained its majority. In that union, which had no aid from the Government and limited support from county councils and local bodies, they had an institution which had maintained itself in a high state of efficiency entirely upon a voluntary basis. The amount of danger and risk to life to which firemen were subjected was greater than that of any soldier in the British Army. It showed, moreover, that voluntary institutions in this country could be made very forcible and effective, and that the smallest inch of compulsion on the part of the Government could make of them one of the most powerful and useful forces of the British Empire.

FIRE PROTECTION AT THE SELFRIDGE STORES.

By S. Bylander.

[Note.—The articles on the steelwork construction, etc., of this important new building commenced in our issue of March 3rd, and will be continued in subsequent issues. The present article deals with the fire-resisting construction and fire protection of the building, which have received very particular attention.

As stated in the previous article on the Selfridge Store, we are indebted to the contractors, Messrs. The Waring and White Co., Ltd., for the drawings and photographs with which these articles are illustrated. It is but rendering bare justice to this firm to acknowledge the speed and skill that they have shown in carrying out the vast amount of constructive work entailed in the erection of this extensive building. Below we give particulars of fire-proofing and mechanical appliances.]

The fire-proofing work in the Selfridge Store has been particularly well thought out, the greatest care having been taken with the object of obtaining as eminently fire-proof a structure as modern resources will admit.

In the first place, the building is of perfectly rigid construction; and, secondly, all the steelwork is covered with concrete, held in position where necessary by anchors or steel wires. Thirdly, mechanical appliances have been installed, both for extinguishing any outbreak of fire and for raising an alarm if fire should happen to occur, the objects being (a) to afford the public the utmost safeguard against risk of fire; and (b) to reduce to the lowest limit the insurance premium for the building and the stock.

It is obvious that so eminently fireproof a building must be considerably more costly than a building constructed in the ordinary way, but the two points given above have been considered to be sufficient reason for the extra expense incurred.

The steelwork frame, as well as the foundations and the piers carrying loads, have been simultaneously designed and dimensioned to carry their proportionate loads, thus providing a structure with all its different parts possessing uniform strength. Good bond is provided, so that the whole structure can be said to consist of steelwork, concrete, and brick wall firmly secured together. Steel anchors are riveted to the steel girders, and built into walls in cement mortar, thus assuring rigid bond between the walls and the steel frame. Steel and concrete have been principally used for the interior of the building, and brick and stone for the exterior; very little wood-work is used.

In order to prevent any serious damage by fire, a building should be strong enough in all its parts to withstand a high temperature, and be capable of safely carrying reasonably heavy falling material. The steelwork should be protected, fire-proofing secured around the steel, and the floors strong enough to carry falling pieces or goods.

The steelwork at the Selfridge Store is covered throughout with at least two inches of concrete, and is prevented from falling off in case of fire by 3-16in. diameter wire laid in the concrete and spaced 9in. apart. Reinforcement bars are covered with at least one inch of concrete. The aggregate of the concrete for fire-proofing was clean destructor clinker and broken brick, passing through ¾-inch mesh. The steel girders were cased in concrete before the walls were built, and the use of stone slabs has been entirely avoided.

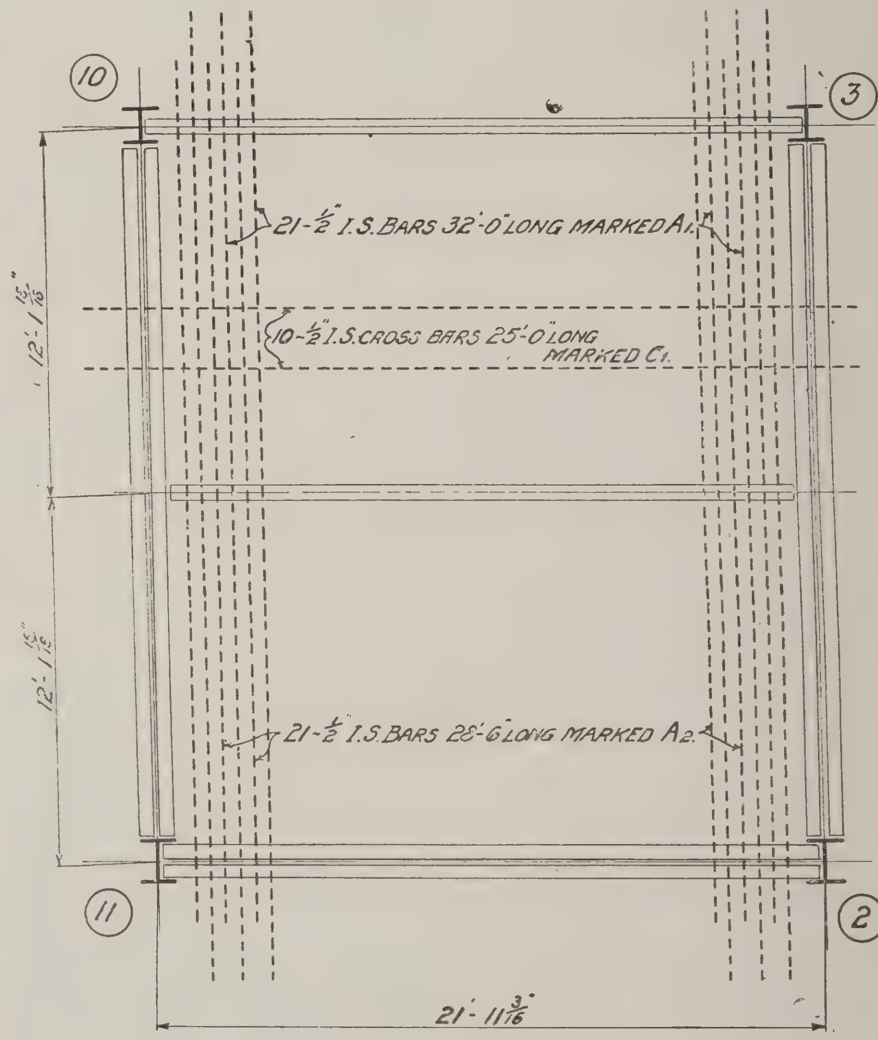
The floors are constructed in reinforced concrete for a span of 12ft. between the steel girders. The thickness of the reinforced concrete is 6½ inches. The concrete casing to the steel girders is made specially thick, in order to form a strong support for the floor.

On top of the reinforced floor is 4-inch concrete filling, the top of which is floated with cement. The floorboards are nailed direct to concrete, without wooden battens; thus the total thickness of concrete is 10½in. No air space is provided between floorboards and concrete, so that in case of fire the floor-boards would be less liable to burn. Sprinkler pipes and electric conduits are embedded in the concrete filling. In only a few cases has a false ceiling been used, and then it has been constructed with steel bars, suspended with iron hangers to the girders. Expanded metal wired to the underside of the steel bars forms a key for the plaster ceiling.

The design of the reinforced floor is shown in Figs. 1 and 2. In Fig. 3 is shown a general plan of floor construction for part of the fourth floor. The letters on each panel of the floor indicate the thickness of the concrete, and the size and spacing of bars. The number refers to the work of the panels.

For standard panels the letter A indicates 6½-inch thick concrete, and B indicates ½-inch bars, spaced 6-inch c. to c. A sample floor slab, 10ft. wide and 12in. span, was tested and loaded up to 1,200lbs. per sq. ft. before failure.

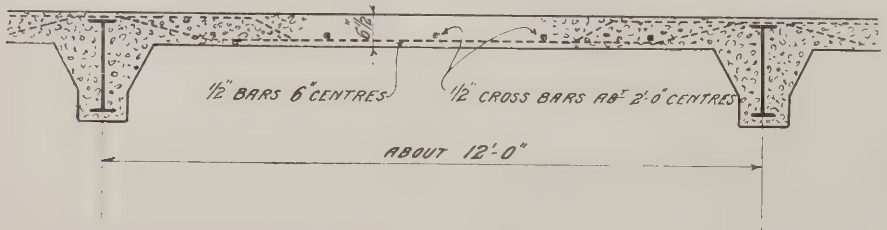
The floors are designed to carry with safety a load of 220lbs. per sq. ft.



10
3
11
2
21-½" I.S. BARS 32'-0" LONG MARKED A1.
10-½" I.S. CROSS BARS 25'-0" LONG MARKED C1.
21-½" I.S. BARS 28'-6" LONG MARKED A2.
12'-1 13/16"
12'-1 13/16"
21'-11 3/16"

TYPICAL PANEL SHEWING REINFORCEMENT IN FLOOR

Fig. 2.



SECTION OF REINFORCED CONCRETE FLOOR

Fig. 1.

(Detailed description of the construction of the floors will be given in our concrete and steel supplement.)

The stairs are constructed in reinforced concrete, and are separated from the rooms by 3in. thick concrete partitions and 2in. thick hard-wood, fire-resisting doors. Five staircases connect all the floors with an independent exit to the street.

Nine passenger elevators, running at a speed of 300ft. per minute, are used for the communication between the different floors, and are enclosed with steel-framed screens, filled in with 3in. concrete blocks set in cement mortar. The outside is finished with ¾in. mahogany.

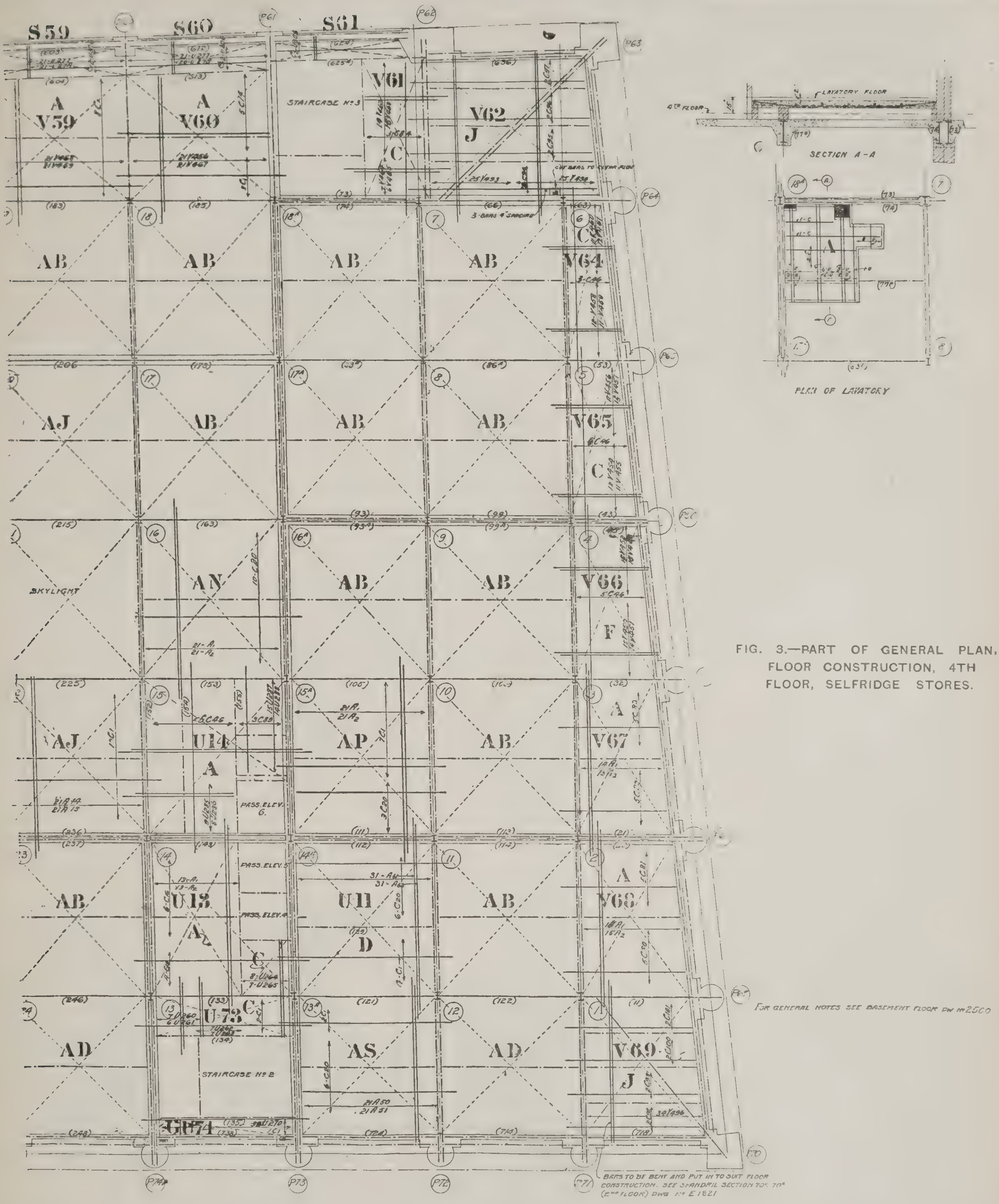


FIG. 3.—PART OF GENERAL PLAN, FLOOR CONSTRUCTION, 4TH FLOOR, SELFRIDGE STORES.

The doors are of 2in. thick hard-wood.

Generally speaking, as few divisions as possible have been put in. Partitions are built with 3in. thick concrete blocks, set in cement mortar, and braced where required with 3 by 1½ steel beams at door and window openings.

The door-openings in the division brick walls are generally 12ft. by 12ft., and are equipped with modern automatic steel rolling shutters of the Kinnear patent. About 470 roller shutters have been erected, and only a few steel folding or sliding doors have been provided.

In Fig. 4 is illustrated the construction of these doors. One shutter is placed on each side of the wall. The minimum distance between them is 2ft. 6in.

The shutters consist of continuous interlocking strips, No. 20 gauge galvanised steel. The ends of each strip are fitted with small malleable cast-iron bits, which prevent lateral motion, while at the same time filling as closely as possible the grooves in which the shutters run.

The section of the slots is such as to secure the utmost strength and rigidity, while forming in the slots themselves an interlocking hinge throughout their entire length. This also leaves the slots free to expand individually when exposed to intense heat without buckling the shutter as a whole.

The shutter coils are immediately over the door, either under the door-lintol or on the face of the wall over the door-opening. Grooved steel girders are fixed on each side of the opening, and likewise a groove is formed by means of a channel in the floor. The shutter roller, containing counterbalance springs to balance the shutter, is carried on cast-iron brackets fixed to the wall with expansion bolts. The outer hood of shutters is made of ¼inch thick steel plate. The shutters are fitted (one on each side of the wall) with mitre spur gear for opening and closing. This is so arranged that both doors are raised or lowered from either side of the opening. In case of emergency, the two shutters at any opening can be automatically lowered by means of a trip release, which is opened by putting a handle at the

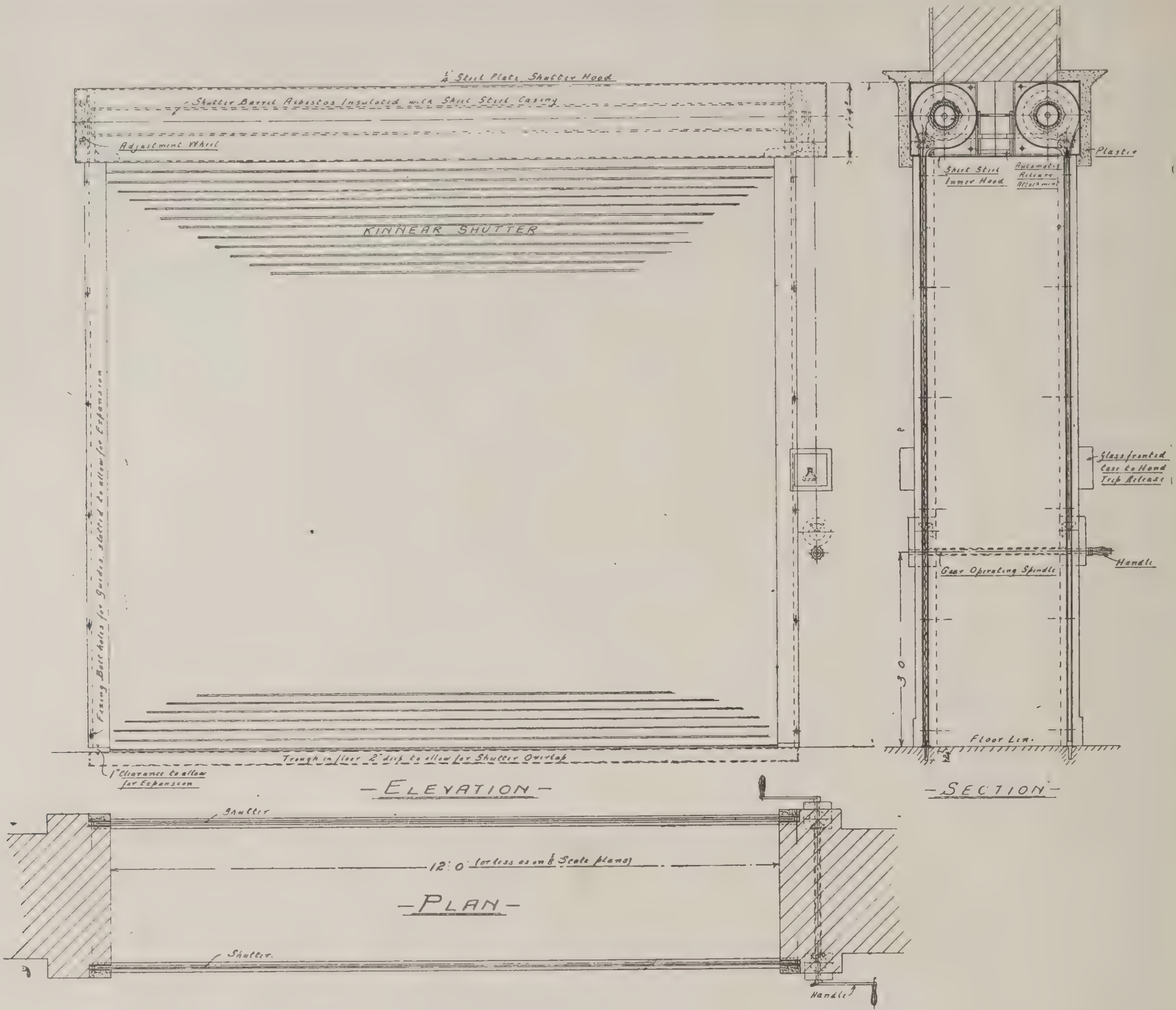
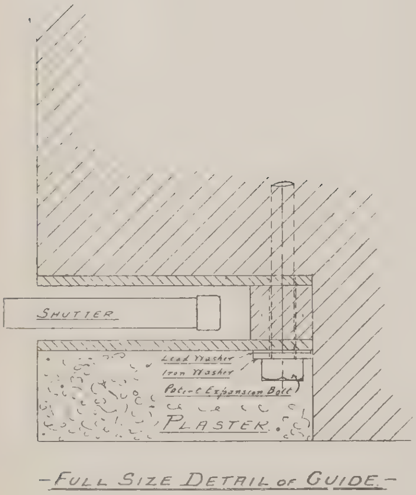
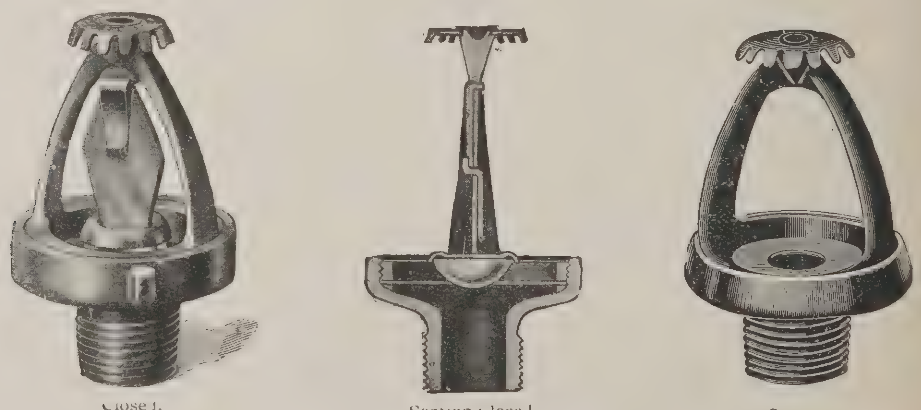

¼" Steel Plate Shutter Hood
Shutter Barrel Asbestos Insulated with Sheet Steel Casing
Adjustment Wheel
KINNEAR SHUTTER
Fixing Bolt holes for Guides slotted to allow for Expansion
Trough in floor 2" deep to allow for Shutter Overlap
1" Clearance to allow for Expansion
-ELEVATION-
Plaster
Sheet Steel Inner Hood
Automatic Release Attachment
Glass fronted Case to Hand Trip Release
Handle
Gear Operating Spindle
3 0
Floor Line
-SECTION-
Shutter
12' 0" (or less as on ⅛ Scale plans)
-PLAN-
Shutter.
Handle

FIG. 4.—DETAIL OF KINNEAR SHUTTER DOORS AT THE SELFRIDGE STORES.



THE KINNEAR SHUTTER DOOR.



Closed. Section Closed. Open.

FIGS. 5, 6 AND 7.—THE GRINNELL SPRINKLER.

side of the opening in a box with glass front, the glass being broken as in the case of an ordinary fire alarm. The shutters were supplied by Messrs. Arthur E. Gibson and Co.

Sprinkler System.

A very elaborate and complete system of automatic sprinklers of the "Grinnell" type was installed in the building by Messrs. Mather and Platt, which firm also were sub-contractors for the hydrant system. A main feature of this installation is that the piping is enclosed in the floor construction, and is not visible from below, only the sprinkler head projecting below the ceiling.

In case of fire, the hot air or the flames, when reaching the ceiling, affects the fusible joint in the sprinkler, and the valve is released, and water under great pressure is spread about the room in all directions. The system is continually charged with water; and should any sprinklers "go off" and water be discharged, additional water is pumped into the system automatically. About 2,800 sprinklers, connected together by about 64,000ft. of piping of different diameters, varying from 1in. for three sprinklers and 6ins. for over 150 sprinklers, form the system, together with pressure tanks, injectors, main valves, pressure indicators, fire brigade street connections, etc. Three sprinklers are provided in each panel between girders, size 12ft. by 24ft.

Quite a network of pipes is placed on top of the reinforced concrete floor, and embedded in concrete. These pipes are fed by rising mains running from basement to roof. Stop valves are placed on the mains to allow of the water being shut off after a fire when sprinklers have been acting and are to be closed again.

In the sub-basement are placed two pressure tanks for storage of water, each tank being 6ft. in diameter by 30ft. long, and containing one-third water and two-thirds air.

There are three sources of supply of water, (1) high pressure town main in Somerset Street; (2) low pressure main in Oxford Street; (3) storage tanks in sub-basement.

The water is forced from the water main into the piping system and the storage tanks by means of hydraulic injectors placed in the third basement. The fact that two-thirds of the volume of the pressure tanks is air permits the quantity of water in the tanks to be changed by slightly increasing or reducing the pressure of the air. Non-return valves placed on the supply pipes from the town main prevent any water returning to the main.

The horizontal main supply pipes are laid in the ventilation trenches under the basement or sub-basement floor. The risers are placed in the lift-shafts. The entire system has been tested with a water pressure of at least 150lbs. per sq. inch. Pressure gauges on storage tanks and main supply pipes indicate the pressure of water, and a water gauge shows the water level in the storage tanks.

The whole system is regularly inspected, and the pressure of the air is regulated by a small air compressor driven by an electric motor.

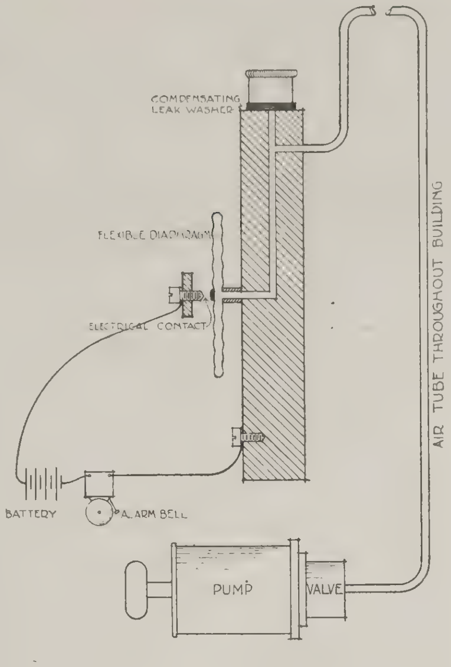
Fire Hydrants.

The building is provided with 36 double fire-hydrants, placed at each floor level in the staircases. Three coils of hose and two branch pipes, with necessary couplings and spanners, are hung in recesses enclosed with glass doors. In all, about 6,650ft. run of 2⅜in. diameter hose is provided.

The supply of water is similar to that for the sprinkler system, and the pressure is raised automatically by means of injectors driven by hydraulic power. The injector is placed in the third basement, and the pipes and valves are so arranged that any of the water supplies can be coupled to the sprinkler system or the hydrant system.

In addition to the above-mentioned supplies from town mains, five fire brigade hose connections are provided under the basement in Oxford Street, Duke Street, and Somerset Street, to enable the Fire Brigade to pump in water by the fire engines into the building's own hydrant system. Three hundred water-buckets, with fixed leads, and fifty chemical fire extinguishers, holding two gallons each, are also provided.

Messrs. Mather and Platt, and the general contractors (the Waring and White Co.) have co-operated in preparing the plans for the piping and machinery.



OUTLINE DIAGRAM OF AERO FIRE ALARM

Very complete and accurate plans were prepared before the erection of the building was done; and although an exceptional amount of piping had to be erected in a short time, the results have been exceedingly satisfactory.

It may serve as an indication of the systematic thoroughness with which the work has been carried out to mention that the position of every sprinkler (nearly 3,000) was dimensioned on the plans. When the concrete floors were being made, holes were left in them for the sprinkler drop pipes. Thus the necessity for extra work in cutting was avoided, as well as the risk of weakening the floor.

In a subsequent issue further details will be given of floor construction and steelwork, heating, ventilation, and water supply.

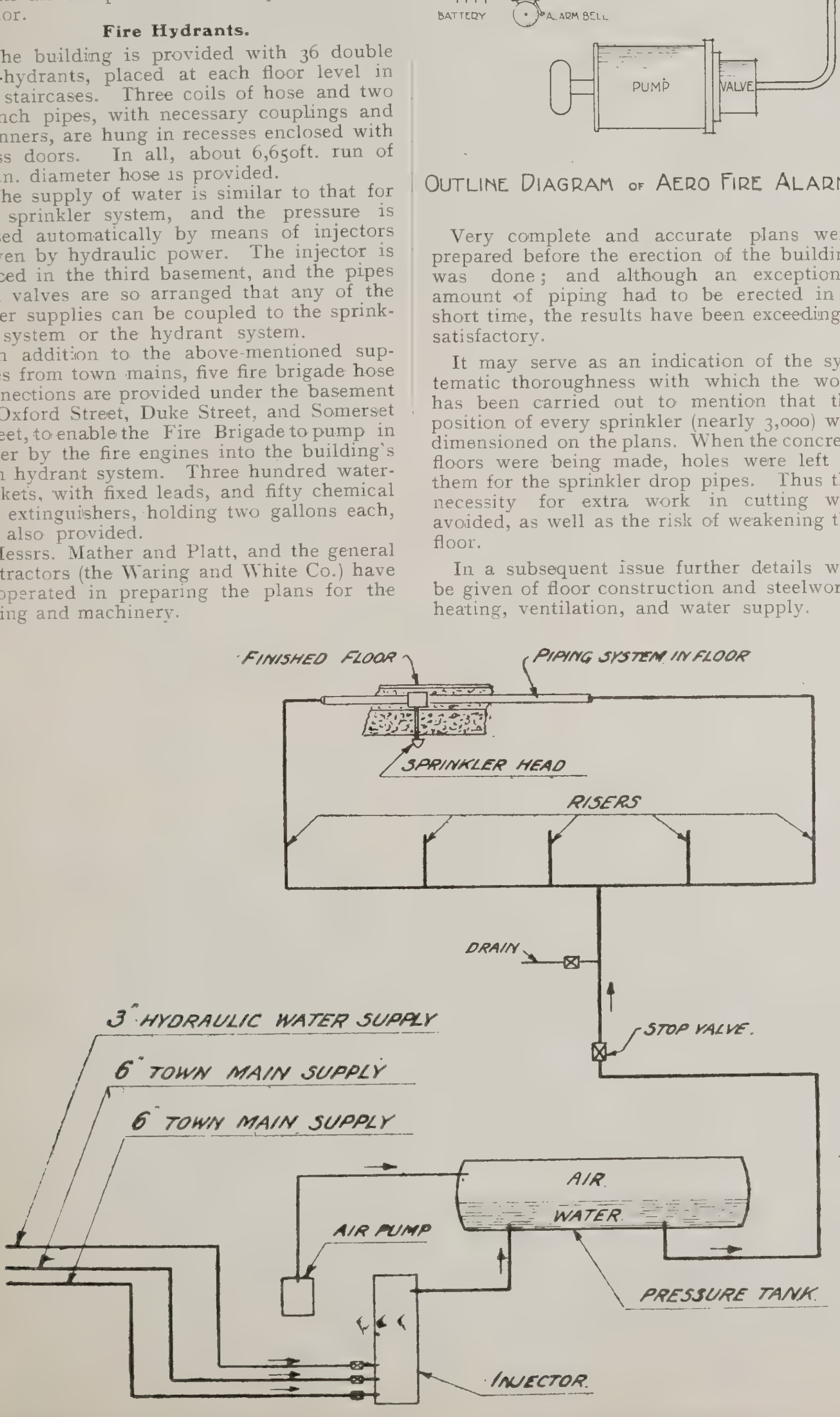


DIAGRAM OF SPRINKLER SYSTEM AT THE SELFRIDGE STORES.

Fire Alarm Apparatus.

The whole building has been protected by the Aero fire alarm system. This is a new departure in fire alarm work, and consists of a small copper tube containing air at normal pressure, which is run through the various rooms and fastened up at the ceilings so as to be practically invisible. There are forty-five lengths of this tube, the ends of which go down to a central indicator board on the ground floor, where they are coupled to registering devices called detectors. A diagram of the sytem is here shown. The detectors signal any pressure generated in the tubes which rises at a more rapid rate than the heating arrangements will account for. By the simple and ingenious method of having a controlled leak in the tubing, all the ordinary heating changes are allowed to pass unnoticed; but any abnormal heat expands the air in the tubes faster than the leak can accommodate it, and the result is that a detector gives a signal. This drops an indicator showing where the fire is situated, and simultaneously rings the fire gong and sends a message to the Aero Fire Alarm Company's Call Station at 92, Queen Victoria Street, London, E.C., which turns out the Fire Brigade. By an ingenious device the whole system can be tested in a few moments. A small quantity of air is injected into each tube, slightly increasing the pressure in it and dropping the indicator. The pressure produced by this means is very much less than any fire would create; therefore, if the apparatus responds to the test, it is an absolute certainty that a fire will be caught in its incipient stages. Within the building there are over seven miles of tubing installed, and the indicator board gives forty-five distinct indications of the location of a fire, thus enabling the firemen on the premises or the Fire Brigade to go straight to the seat of the fire.

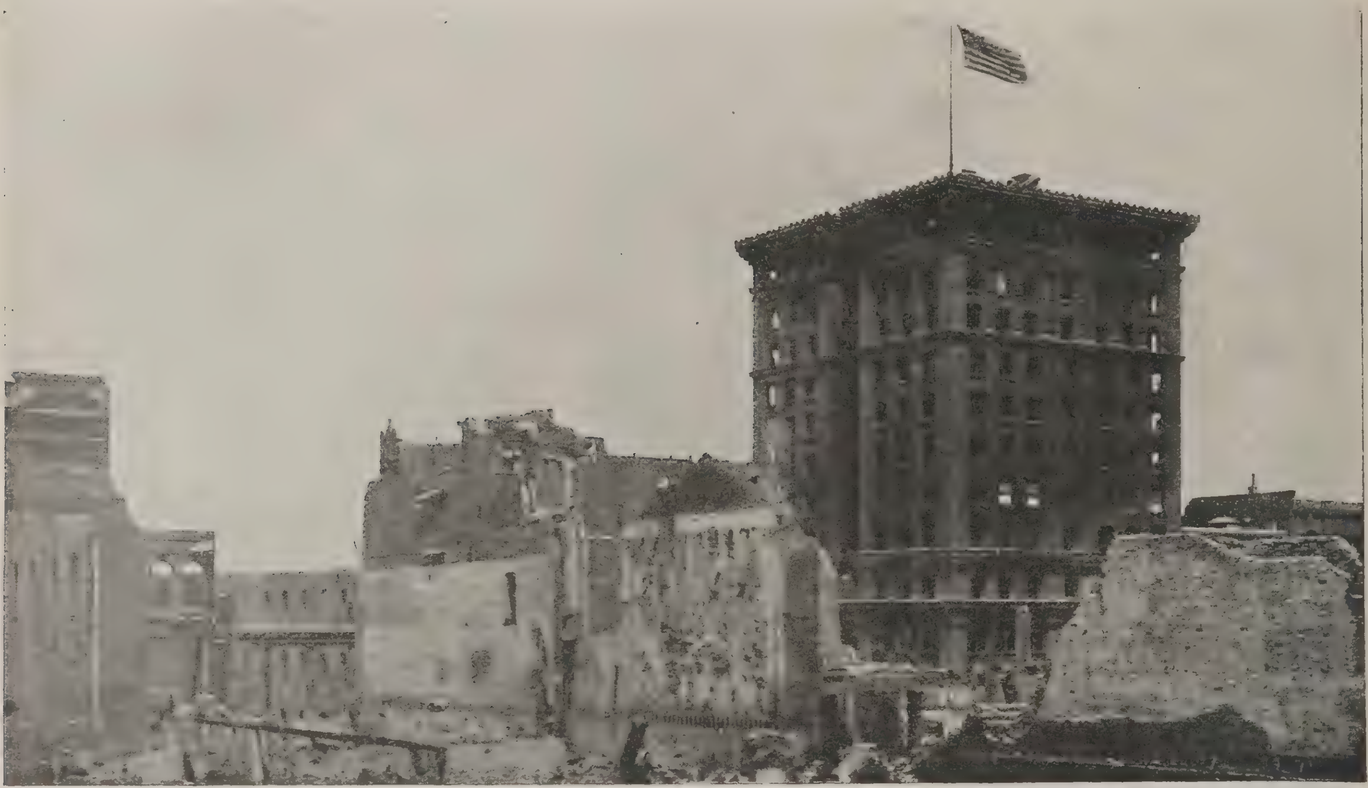
FIREPROOF STATE BUILDINGS.

The annual report submitted by Mr. Franklin B. Ware, State architect, of Albany, U.S.A., contains several references that are interesting from the British point of view, more especially with regard to questions of fire risk.

Serious consideration of the advisability of the State building its more important structures of a fireproof character is recommended; and Mr. Ware also recommends a more uniform system of selecting architects by competition for State work.

"The cost of rebuilding structures damaged or destroyed by fire during the past eight or ten years," says the report, "has been over $1,000,000, and but a small proportion of this amount was covered by insurance. The cost of fireproof buildings will exceed the cost of non-fireproof structures by about 20 per cent. The cost of maintenance on buildings at the various State institutions, due to ordinary wear and tear and deterioration, is considerable, and much of this expense might be saved by adopting fireproof construction."

Regarding the question of throwing open to competition the architectural work commissioned by the State, Mr. Ware makes the following observations, which are not altogether without relevancy to practice in this country: "Should the State contemplate providing for the selection of architects by competition for State work, when the circumstances warrant, a general law should be passed containing the provisions that all competitions shall be held only when recommended by the State architect, with the approval of the Governor; that the rules and regulations governing competitions should be prepared by the State architect, and that the Board of Award should be composed of men capable of passing on the architectural, as well as the practical features of the design. Practically all the best architects in the country are members of a society that has formulated a code for the conduct of competitions, and if the State expects to obtain the best service of these men by competition, the conditions should be drawn up so as not



THE "KOHL" BUILDING: TAKEN AFTER THE GREAT EARTHQUAKE AND FIRE IN SAN FRANCISCO.

to conflict with the code, except as its provisions might conflict with the State laws. The State architect should be the adviser in all matters of an architectural nature connected with State work, and his powers and duties in connection with competitions should be much greater than they have heretofore been under the laws providing for competitions in specific cases.

Mr. Ware criticises the work performed at certain institutions, as of an unsatisfactory character or begun before plans and estimates were approved.

Reference is made to the progress made on the new State Education building to be erected in Albany at a cost of over $3,000,000. Delays were caused by the discovery of extensive quicksand pockets, necessitating extra foundations.

TESTS WITH EXTINGUISHERS.

It being somewhat outside our purview to deal with extinguishers, we will only mention that reports No. 134 and No. 136, which deal with small fire extinguishers, have just been issued by the British Fire Prevention Committee. These may be useful for reference where architects have to specify extinguishers. Report No. 136 in particular should be of use to architects who have to deal with motor works, motor garages, etc., for under that report an extinguisher is dealt with which is intended to extinguish petrol fires. The appliances in this case were Danish. There was a considerable attendance at the tests, which were under the direction of a strong sub-committee, of which Mr. Percy Collins, J.P., was the directing member.

The Emigrants' Information Office desire specially to warn intending emigrants to view with great caution offers of employment in Venezuela, especially when such offers are coupled with the obligation of giving security by making an investment in the undertaking offering employment. Official information has recently been received of a considerable number of cases in which emigrants who have gone out in response to similar offers have found themselves destitute and have had to apply to a British Consul for relief.

THE KOHL BUILDING, SAN FRANCISCO.

The relationship between earthquake and fire is only too intimate; and the Messina disaster being still fresh in the memory, the subjoined account and accompanying illustration of a building that withstood the earthquake and great fire in San Francisco in April, 1906, are of timely interest. The reference is to the Kohl building, which is situated at the north-east corner of California and Montgomery Streets, San Francisco. It was designed by Mr. G. W. Percy, architect, who died shortly after the work of construction was started, when Mr. Henry H. Meyers, who had been for many years associated with Mr. Percy, and who is a member of the firm of Meyers and Ward, architects, completed the undertaking.

The building is described as "a full steel cage frame" resting on reinforced concrete piers and cantilever foundation. The steel frame consists of channel and plate columns, the spandril panels being carried on deep open girders, which extend from the top of the windows of one storey to the bottom of those in the next storey above, and provide the lateral bracing required in the frame, no gusset plates or other method of bracing being provided.

The floors are constructed of framed steel beams filled in with concrete panels about 3½ins. thick, reinforced with expanded metal. Except in the corridors, the concrete is surfaced with a trowelled cement finish, all offices having a wearing surface of English battleship linoleum cemented to the concrete.

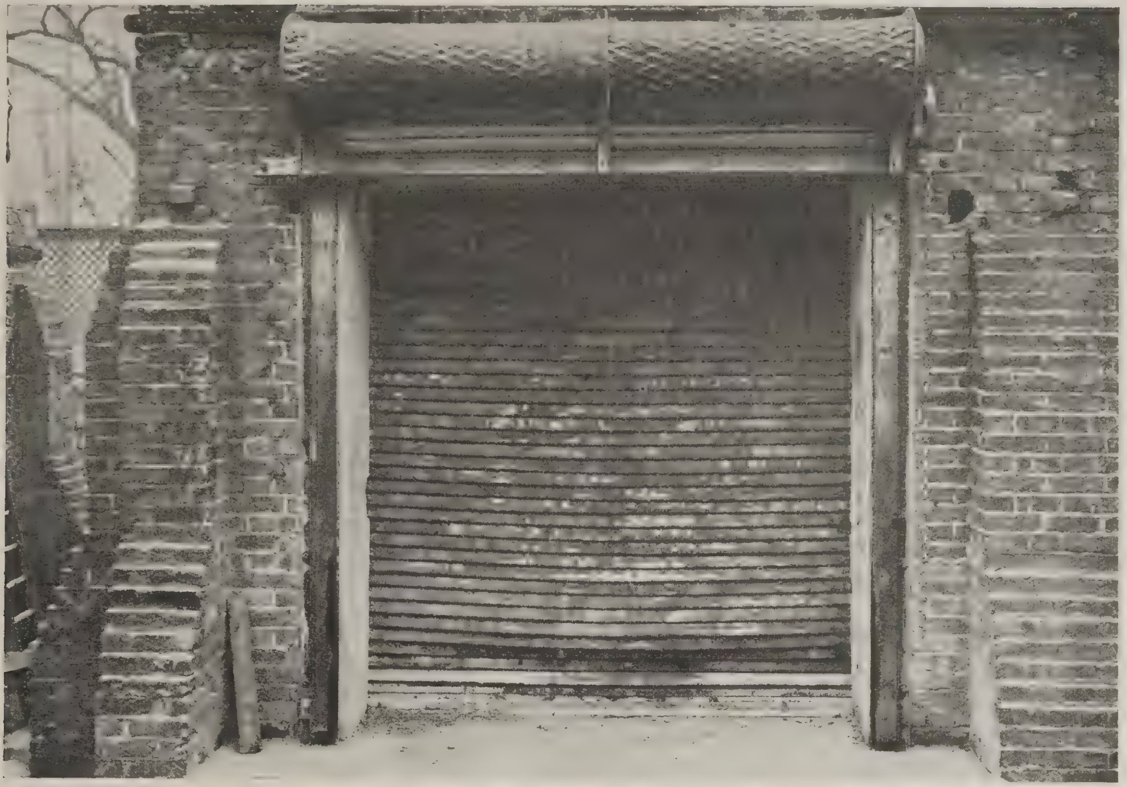
The lower flanges of all floor beams and girders were, before the floor slabs were put in, wrapped with galvanised wire netting of ½-in. mesh, secured in place by the concrete floors extending down to the lower flanges of the beams. This netting was then plastered 1-in. thick with a rich cement mortar containing a liberal quantity of asbestos fibre. Under these beams were then suspended ¾-in. steel channels about 12ins. apart, to which expanded metal lathing was wired, and this was plastered with a material made from the same formula as the English granite plaster. The interior columns are surrounded with ¾-in. steel channel studs and expanded metal lathing, which is plastered with the above-mentioned asbestos mortar. The columns are then again surrounded with steel studs, and lathed and plastered as before described. In this way is produced a double air-space that is assumed to be of great value for fire protection.

The interior partitions of the building were constructed with steel studs about 2½ins. in width, and about 12ins. on centres, and then lathed with expanded metal and plastered with the American hard wall plaster. Other partitions, dividing the offices, were constructed solid, 2ins. thick, of hard wall plaster on metal studs, and expanded metal lathing, this form of partition being identical with the granite plaster 2-in. partition erected by the Granite Silicon Plaster Co., in England.

The exterior walls are of brick, faced on the street fronts with Colusa sandstone. The roof is constructed with concrete slabs, similarly to the floors, with the addition of felt and asphaltum.

Fire reached several rooms (mainly in the four lower storeys) of the building through the breaking of the windows by the extreme heat, and burnt out everything in the shape of furniture. But beyond this there was nothing to burn, and so the building escaped destruction. It is suggested by Mr. William Ward, chairman of the Granite Silicon Plaster Co., Ltd., 36, King's Road, St. Pancras, to whom we are indebted for the foregoing particulars and the accompanying illustration, that the building might have enjoyed complete immunity if the windows had been constructed with metal frames and filled with wired plate glass. As it was, it passed through the ordeal very creditably, as the damage to it did not exceed £100, and mainly consisted of the loosening of marble wainscoting in the corridors.

The illustration brings into striking contrast the relative values of the special system of construction adopted in the Kohl building, and of the ordinary type of buildings by which (or, rather by the ruins of which) it is surrounded. Whether or not the Kohl building experienced the full force of the earthquake is, perhaps, not certainly known; but, in any case, its remarkably sturdy endurance of the consequent fire is a sufficient vindication of the system upon which it has been constructed, and more particularly of the fire-resisting properties of the expanded metal and plaster-work.



ROLLING SHUTTER DOORS. VIEW OF INSIDE SHUTTER AFTER TEST (FROM OUTSIDE. WITH OUTER SHUTTER ROLLED UP INTO HOOD).

TESTS OF ROLLER SHUTTER DOORS.

The first report of the recent series of tests with roller shutter doors has now been issued by the British Fire Prevention Committee (publication No. 135), which deals with the test of a set of two steel rolling shutters, undertaken on November 4th, 1908, with the Wilson rolling shutter doors, made by the Wilson Manufacturing Company, whose agents are Messrs. Mountain and Gibson, Ltd., of Bury, Lancashire.

The importance of the roller door question cannot be over-rated; for by means of such doors it is now possible to provide buildings with convenient means of closing them off in compartments, where large openings have to be protected.

The matter has assumed increased importance to the metropolis since the new Building Act allows for larger and more numerous compartments than heretofore to be separated from one another by walls having openings of larger area than were formerly permitted. The result will be not only the erection of a large number of new buildings of greater cubic extent, with numerous compartments so separated off, but (it may be confidently expected) quite a number of shopkeepers will be gradually joining up their various shops, and providing communications of a larger and more adequate type than was formerly the custom, when only small doors were admissible.

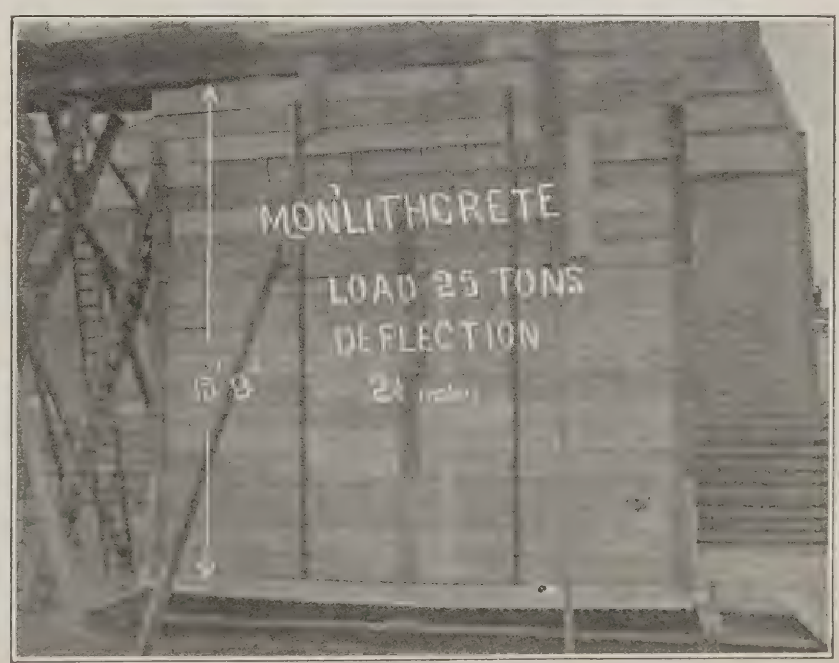
The tests with these double rolling shutter doors, as also with other doors that have been recently undertaken, are naturally receiving very great attention, and practically all the heads of the Government Departments concerned have been present at them in rotation.

At the tests here reported upon, the Council of the British Fire Prevention Committee was represented by Sir Henry Tanner, I.S.O., F.R.I.B.A., principal architect to H.M. Office of Works, and among others attending was Colonel Sir E. Raban, K.C.B., the Director of Works at the Admiralty. The Executive of the British Fire Prevention Committee was represented by Mr. Edwin O. Sachs, F.R.S.Ed., and there was a testing sub-committee in charge of the operations, which comprised Mr. Max Clarke, F.R.I.B.A., as directing member, with Messrs. Ellis Marsland (district surveyor), W. Grellier (district surveyor), M. Garbutt, F.R.I.B.A.; E. J. A. Fulkes (insurance surveyor); Mr. Percy Collins, J.P., and Chief Officers R. W. Henderson, J.P., and J. H. Dyer, both of the National Fire Brigades Union.

In the preliminary note to the report, Mr. Max Clarke, as the directing member, impresses upon the users of roller shutters the necessity of seeing to the proper fixing of the doors, a point frequently overlooked when getting estimates. We certainly desire to endorse Mr. Clarke's views on this important point.

The test in question was undertaken with a view to obtaining the highest classification —*i.e.*, full protection, Class B, which is the same classification for which reinforced concrete floors are generally entered. In a manner, the idea was to prove that, given a floor that was fully protective—*i.e.*, that has withstood four hours' severe fire—it was also possible to protect the vertical openings for the same period and under the same conditions. The double doors in question obtained their classification.

The double-door test under notice may, in a manner, be deemed to be a record; for not only did the doors withstand the four hours' continuous temperature, rising to over 1,800 degrees Fahr., followed by the application of water, but they withstood that strain particularly well, and a photograph goes to show that one of the two doors could also be slid up—*i.e.*, worked after test.



THE MON'LITHCRETE TEST.

View of the Mon'lithcrete floor slab after the test described in our issues of Feb. 17th and 24th. The system is that of The Fawcett Construction Co., Ltd.

A NEW TEST FOR CONCRETE.*

By J. S. Owens, B.A., M.D., A.M.Inst.C.E. etc.

It is customary in specifications for works in which concrete is used to state clearly the tests which the cement must satisfy. Similarly the exact nature and proportions of the aggregate are laid down, and the method of mixing which is to be used. It will therefore be seen that, while the nature of the actual material is clearly specified in the case of each of the separate ingredients to be used, only the method of arriving at a certain result is specified in the case of the concrete itself. In other words, while the nature and quantity of each ingredient are carefully specified, the quality of the resulting concrete, which depends upon thorough mixing, is not thereby assured.

It therefore appears that there is here a weakness in our specifications which may entirely nullify the effects of the care otherwise displayed in drawing them up. Reasoning along such lines as these the author was led to devote his attention to devising a test which could be applied to concrete on the works; and which would enable the engineer to satisfy himself that the mixing was being carried out efficiently.

The methods of determining when concrete has been properly mixed, which have been used up to the present, are as follows:—Inspection of the mass. This is at best only a very crude method, and, as will be shown in this paper, ineffective. It is impossible by inspection alone to tell the difference in the appearance of concrete composed of one part of cement to two of ballast, and concrete having one part of cement to three of ballast. The even distribution of the water can, however, be easily recognised by inspection alone, owing to the uniform stiffness of the mass.

Another method, which is sound in principle, is to make briquettes of the concrete and break them after say seven days; thorough mixing will be indicated by uniformity of breaking stress. This can hardly be regarded as a works test, and suffers from the drawback that considerable time must elapse before the result is known. It would be difficult, for example, for a clerk of works to suspend concreting operations for the week or so necessary to get a result by this means.

Again, pigment has been added to the concrete, to test the mixing. Briquettes were made, allowed to set, and broken; the fractured surfaces being examined for even distribution of the pigment. This is very ingenious, but clearly is not applicable to testing concrete on the works; where pigment could not be added. It has also the same disadvantage as the previous test, in addition to the difficulty of telling by mere inspection whether the pigment is evenly mixed with the concrete.

When Mr. Taylor was designing his well-known concrete mixer, he adopted a novel method of testing it. The drum of the mixer was made of glass, and layers of coloured beads were placed in the bottom. He then noted the number of revolutions necessary to mix the beads until there were as many of one colour as of another in a given area of surface. This method is of course useless for concrete, nor indeed could the beads give any indication as to the amount of mixing which concrete would require. Probably the only use to which it could be put would be to compare the relative mixing power of different arrangements of drum or deflectors.

In the author's opinion, too little attention has been given to the question of concrete mixing, especially in view of the enormous strides which have been made of recent years in the application of concrete reinforced with steel. Not only is there more concrete used now than there was some years ago, but the protection of the steel reinforcements calls for a greater exercise of care in the making.

Perhaps the simplest definition of properly mixed concrete would be:—Concrete in which the various ingredients are as uniformly distributed as the size of the particles composing them will admit. Until this uniformity of distribution has been attained, the mixing process must be regarded as incomplete. On the other hand, when a uniform mortar has been formed of the sand, cement, and water, and the particles of stone or gravel have been spread evenly through this mortar, we may say that mixture is complete. The question, therefore, is how to determine when this uniformity of distribution has been attained.

If we take a few small samples from different parts of a heap of concrete, and if we can tell in some simple way whether all the samples contain the same relative proportions of stone, sand, and cement, we have a means of telling whether the concrete is properly mixed or not. When the mixture is complete, all the samples will, if of the same size, contain the same amount of the respective ingredients.

A knowledge of the different rates of settlement, in water, of materials composed of different sized particles, of the same sp. gr., suggested that this peculiarity might be utilised to separate rapidly the ingredients composing concrete; and a series of experiments, the results of which are given in this paper, was undertaken to determine the practical value of the method.

It was found that when a sample of concrete, freshly mixed, was placed in a tall, narrow glass vessel nearly full of water, and shaken up, on standing, the cement, sand, and stone, settled at very different rates. The large stone collected at the bottom; over them, and clearly defined, came a layer of sand; and over the sand the layer of cement; the lines of demarcation being perfectly distinct. The next question was to determine whether the thickness of these layers was directly proportional to the amount of material present in the sample; if so, here was a method of telling at once whether each sample contained the same proportions. It was not essential to know the exact amount of material present in each layer, but simply whether the relative proportions were the same in each sample.

The success of this method of separation depends on the fact that the rate of settlement of particles in water, if of the same specific gravity, is governed by their size. To bring out the difference in the rate of settlement, a tall vessel is necessary, since the object is to make the time interval between the arrival of the various sized particles at the bottom as great as possible.

For particles over 0.0039 in. in diameter, the velocity of fall in water is given by the following formula:—

Where v represents the velocity in ft. per sec.
d represents the diameter of particle in ft.
s represents the sp. gr. of the particle.

then v is equal to $4{\cdot}3\sqrt{d(s-1)}$

This is the law which governs the settlement of the sand; that is, the velocity of descent varies as the square root of the diameter of the grain. When, however, the diameter falls below 0.0039 in., the viscosity of the liquid controls the rate of settlement; and it then varies as the square of the diameter.

The British Standard Specification for cement states that it must not give a residue exceeding 18 per cent. on a sieve having 32,400 meshes per square inch. These meshes are 1-180 of an inch square, and the wire forming the sieve is 0.002 of an inch in diameter; 1-180 of an inch is approximately 0.0056, and if we deduct from this the diameter of the wire, 0.002, it gives us 0.0036 of an inch as the size of the actual openings, and hence of the largest grain which will pass through. Particles of cement are therefore usually under 0.0039 of an inch in diameter, and consequently do not even obey the same law which governs the deposit of sand. For example: in a tube 18 inches high and 1 inch diameter, the settlement of the sand, even the finest particles, was complete in about 10 seconds, whereas the cement took 5 to 10 minutes to deposit; thus the sand sank over 30 times as fast as the cement.

The way in which the concrete deposits in the test glass is curious. On shaking up a sample with water in a tube and placing to settle, the large particles of gravel sank to the bottom immediately, to be followed by the sand in five or ten seconds, but the cement behaved in a different way. The first effect was always a clearing of the top of the water, and the formation of an ill-defined, cloudy line of junction between the clear water and that containing the cement. In perhaps five minutes this line of junction, which was descending slowly, altered in appearance almost suddenly, and showed a clear, well defined surface. On measuring the depth of the layer of cement at this stage it was found that it was still shrinking very slowly; but when measured at intervals of two or three minutes it was noticed that after a short time, perhaps 10 or 15 minutes, a minimum thickness was reached, and no further contraction took place. This was clearly the time at which to take a final measurement, and it was found that the thickness of the layer depended, other things being equal, on the amount of cement present in the sample. Provided therefore, that the minimum thickness of cement layer is taken, it is not essential that the time of settlement should be exactly the same, when it is desired to compare two samples.

It was found, however, that the thickness of the cement layer depended somewhat on the time which had elapsed since wetting; and in tubes which had been allowed to settle and then shaken up again, each time that this was repeated gave a thicker layer of sediment than before; owing doubtless to the reaction between the cement and water. It is therefore clear that comparison as to the amount of cement present can only be made by this method when the samples are from the same mixing. A few minutes' more exposure in one sample than in another will, however, make little difference.

The effect of the thickening of the layer of sediment appears to depend somewhat also on the nature of the cement used, some cements being more sensitive than others in this respect. If the process of shaking up and standing be repeated often enough, the surface will eventually fail to become sharp, however long the test glass may stand; the sediment will become flocculent, and the surface ill defined.

If too small a quantity of water be used to shake up the concrete with, another error of some importance is introduced. When the tube is placed to settle, the sand and gravel at the bottom entangle a certain amount of cement, and the less the quantity of water used the more cement will be thus entangled, owing to the mixture of cement and water being more concentrated. When the total height of the column of water and concrete was about twice that of the concrete alone, the amount entangled in the sand was about 35 per cent.; when, however, a water column of about four times the height of the concrete in the tube was used the amount of cement caught in the sand layer was negligible.

A curious effect was noticed when the tubes were placed to settle exposed to sunlight. The layer of cement on settlement was not level, but inclined downwards from the sunny side. The cause of this was that in each tube an ascending current was formed on the sunny side and a descending one on the other, the change of direction occurring on the bottom, over the surface of the cement layer, where a distinct current setting towards the sunny side therefore existed; and this carried the suspended particles with it and piled them up on that side. The direction of the currents could be seen from the movements of these particles, and the amount of tilting of the layer amounted to about one in ten.

---

*Abstract of a paper read by J. S. Owens, B.A., M.D., A.M.Inst.C.E., etc., before the Society of Engineers, March 1st, 1909.

A series of experiments bearing on the evolution of the test was then described, and tables showing the results were given.

Passing on now to the application of the test in practice, the author said that the strength of concrete depends practically entirely upon that of the mortar which cements the larger particles of stone together. That being so, we may look at the question of proportions in this way:—The ratio of cement to sand used will be determined by the strength of the concrete required, and the amount of coarser particles of stone or gravel which may be added will be the largest quantity which permits of complete separation of the individual particles by the mortar. In other words, there must be a little more mortar than will completely fill the voids in the stone or gravel; and any increase over the amount necessary to do this does not mean an improvement in the strength or impermeability of the concrete. We come therefore to the conclusion that it is the mortar which, other things being equal, determines the strength of the concrete.

Now it is a well-known fact that to mix mortar effectively requires more work than to mix concrete containing coarser particles. A mixer which is working on cement mortar cannot turn out so great a quantity as when the machine is working on concrete. It is therefore obvious that if, when mixing concrete, it can be shown that the sand and cement are thoroughly mixed together, we may feel sure that the coarser particles are properly distributed throughout the mass. The importance of this is that it removes a difficulty in the practical carrying out of the test, since it is unnecessary to measure the amount of coarse particles of stone in a sample if we can measure the sand and cement. If therefore the samples contain slightly different amounts of mortar, as may happen if we include the coarse particles in taking them, this will not affect a conclusion drawn from the relative amount of sand and cement present in each. Again we may entirely remove the stones from our sample, as is convenient in dealing with concrete having a coarse aggregate, and test the mortar only, knowing that if it is well mixed the concrete is well mixed.

It is desirable that the samples taken for the purpose of the test should be of the same volume, as nearly as possible, although it is not essential that they should be exactly the same, since the only thing necessary to show that a perfectly uniform mixture has been attained is that the ratio of the thickness of the sand to the cement layer should be the same for each sample. It is difficult, with a material such as concrete, to fill a small measure so as to be certain that each time you have exactly the same volume of mortar present; since the inclusion of a large stone more or less may make a difference in the amount of mortar contained. It would therefore be impossible to be certain that a slight inequality in the actual thickness of sand and cement in one sample, as compared with sand and cement respectively in the other, meant that mixing was incomplete. We can, however, be sure that inequality in the ratio of sand to cement in one to the same ratio in the other means incomplete mixture; and conversely, that equality of these ratios means complete mixture.

In making an actual test of concrete, although the entire sample may be placed in the test glass and shaken with water, it was found preferable to separate out the coarse particles of stone before applying the settlement test. When the aggregate contains stones up to two inches in diameter there is danger of breaking the glass in introducing the sample and shaking it; and further, the glass becomes cumbersome owing to the large size required. Again, although the large stones sink to the bottom before the sand, unless there is enough sand in the sample to entirely fill the voids between the stones, it does not settle with a clearly defined upper surface, but trickles down between the stones, and leaves an irregular surface on the top.

TABLE A.

Time Required to Empty Feed Hopper into Drum.	Time of Mixing after Whole Charge was in Drum.	Thickness of Layers.				Ratio $\frac{S}{C}$	Ratio $\frac{S}{C}$	Time of Discharge.
		Sand.		Cement.				
		Tube 1.	Tube 2.	Tube 1.	Tube 2.	Tube 1.	Tube 2.	
Seconds.	Seconds.							
30	—	1.2	1.2	2.0	2.2	0.60	0.55	Six seconds per barrow, or one-third of a charge.
20	10	1.0	1.0	1.7	1.9	0.59	0.53	
25	20	1.3	1.3	1.9	1.9	0.68	0.68	
30	30	1.0	1.0	1.8	1.8	0.55	0.55	
25	35	1.4	1.4	1.9	1.9	0.74	0.74	

The method adopted in the case of concrete having stones up to ¾ inch in diameter was as follows:—Two test glasses were used, having a diameter of 1.5 inch and a height of 13 inches; a funnel fitting into the top of the glasses was provided, and a conical wire screen fitting into the funnel; the screen had meshes about one-twelfth of an inch square, or 144 to the square inch. Two samples were taken in a small tin measure, containing 6.2 cubic inches, each being taken from a different part of the heap of concrete under test. The funnel with its screen having been placed over a test glass, a sample was emptied into the funnel, care being taken to wash out the last particle from the measure. A small stream of water was then allowed to trickle through the concrete, which was stirred vigorously meanwhile, with the result that all the cement and fine sand were washed through the wire screen into the test glass, and in about a minute the coarse stones were left perfectly clean in the funnel. These were thrown away, or retained for measurement if desired; and the test glass, having been filled to within about an inch of the top with water, was shaken up and placed to settle. The sand commenced to fall immediately, and was all down in a few seconds, leaving the cement in suspension in the water. The cement then gradually settled down, and in about 10 minutes reached a layer of minimum thickness. The depth of the sand and cement in each glass was then measured.

In testing concrete having stones up to two inches in diameter it is best, as suggested before, to remove the large stones from the sample, and use only the mortar for the test.

The test as described may be applied to determine whether concrete contains the specified proportions or not; it will, however, be better, as a rule, to determine this from a measurement of the gauge boxes combined with a mixing test. A fair idea on this point may be obtained as follows:—Prepare a sample of concrete having the specified proportions, and mix thoroughly, taking care that it is made from the same materials and wet at the same time as the concrete it is desired to test the proportions of. A sample of the latter may then be tested against the specially prepared sample, and if the sand and cement differ materially in each, we may infer that there is a difference also in the proportions present. It is difficult, however, in a small sample to tell much about the proportion of stone or gravel present; and it must be noted that for the purpose of testing the mixing, the smaller the sample which can be conveniently used the more accurate is the result; whereas in dealing with the proportions, the larger the sample the better. In the example which follows, each test was made with a different charge of materials in the machine, and it will be observed that the sand and cement layers differ materially in thickness in the different samples, showing that the proportions were not being accurately maintained. The chief cause of this lay in the measurement of the sand, which was somewhat falsified by the fact that the proportion present in the ballast used varied.

Up to the present the test has been applied practically to only one concrete mixer, and particulars of this are given. No attempt is made here to compare this machine with others on the market, but the results are given because they bring out one of the uses to which such a test may be applied.

The machine tested was in operation preparing concrete for a large ferro-concrete building. This machine was of the rotary drum type, and had fixed on the internal surface of the drum a peculiar arrangement of deflectors, which had the double effect of ploughing through the material lying on the bottom of the drum and of lifting part of it to the top, from where it was discharged as a shower on that below. A fixed hopper was provided, which received the dry materials, and discharged them into the mixing drum, when a gate connecting the hopper and drum was opened. Water was supplied when the hopper had emptied, the whole operation going on while the machine was running. The discharge was into wheelbarrows, three of which were required to one charge. Only one man was employed attending to the machine. The drum had a capacity of 5 cub. ft. and ran at 18 revs. per min., the output as per maker's list was 50 yds. cub. per 10 hrs.

The concrete was composed of gravel 4, sand 2 cub. ft. and 100 lbs. of cement. The largest particle of gravel would pass a ¾ inch ring. The method of carrying out the test was as just described, and the results were as shown in Table A.

The mixture in this case was uniform 20 seconds after the charge was in the drum. It must, however, be noted that the feed hopper took an average of 26 seconds to empty, during which time the mixing of that part of the charge which had entered the drum was going on. Putting the time of discharge as 20 seconds, it will be seen that the whole operation of feeding, mixing, and discharging need occupy only 66 seconds. This is assuming that discharge takes place as soon as the mixture is complete; but this was not the case in the present instance, since the concrete could not be used as fast as the machine could turn it out. If worked to its full capacity, it could therefore mix 101 yds. c. in 10 hrs., which is double the amount it was rated for. It is obvious, however, that it would be impossible for one man to feed 101 yds. to the machine in 10 hours; hence to get the maximum capacity more attendants would be required.

(To be continued.)

A Rubens Museum is in contemplation by the city of Antwerp. It is to be lodged at No. 7, Rubens Street, a house built by the Flemish master.

Major Lewis Henry Isaacs, of Verulam Buildings, Gray's Inn, W.C., architect and surveyor, formerly Conservative M.P. for the Walworth Division, for 42 years surveyor to the Holborn Board of Works, who died on October 17th, aged 78, left estate of the gross value of £49,627 7s. 4d., of which the net personalty has been sworn at £40,993 18s.

In Parliament.

The Queen Victoria Memorial.

In the House of Commons last week, Mr. Ellis asked the First Commissioner of Works when it was expected that the memorial to Queen Victoria opposite Buckingham Palace would be completed; and, having regard to the desirability of this on many grounds, whether the approaching fine weather and longer hours of daylight would be utilised to the fullest extent for the purpose of pressing on the work.

Mr. Harcourt, in reply, said: I cannot yet fix a date; everything depends upon the rate of progress of the sculpture and the rapidity with which it can be placed in position. Every effort is being made, and will continue to be made, to press on the work.

The Facing of Ferro-Concrete.

Mr. H. C. Lea asked the First Commissioner of Works whether he was aware that in the new Post Office buildings in the City being built in ferro-concrete, only one coat of Portland cement facing was being applied; whether he was satisfied that this was sufficient to finish the exterior rough surfaces of the ferro-concrete, especially in running mouldings, as it was not recognised by architects and the plastering trade, two coats always having been considered the minimum; and also whether one coat was in the specification of the architect to the new Post Office buildings.

Mr. Harcourt, in reply, said:—The work is being done in accordance with the specification, and is considered by many architects to be the most satisfactory treatment of concrete.

To another question as to whether a deputation would be received from the men, Mr. Harcourt said he had received deputations previously over buildings for the Post Office. He would be glad to receive any information which Mr. Lea or any other honourable member might wish to submit to him in writing.

Re-erection of Buildings in Jamaica.

Mr. Watson Rutherford asked the Under-Secretary of State for the Colonies whether the delay of over two years since the earthquake in re-erecting the Government buildings in Kingston, Jamaica, had been caused by some valid reason; and, if so, what reason; whether something could be done to expedite this work; and whether his Department had been or were endeavouring to help forward the work by assistance, either in advice or financially.

Col, Seely, in reply, said a contract for the reconstruction of the Government buildings at Kingston had been executed, under which King's House had to be completed by April 4th, 1910, and the Post Office and Treasury by May 31st, 1910. The Secretary of State had no reason to think that there had been any avoidable delay in carrying through this matter, having regard to the precautions necessary to provide buildings capable of withstanding earthquake shocks. The Governor of the Colony paid a special visit to England last year in connection with the matter, and his efforts had received full support from the Colonial Office.

New Post Office for Bolton.

Mr. Buxton, the Postmaster-General, has informed Mr. Tyson Wilson that the question of the erection of a new post office at Bolton has been attended with various difficulties, and the plans are not yet settled. He is not yet in a position to say when building operations can be begun.

Accidents and Lead Poisoning.

In a Home Office table relating to accidents, industrial poisoning, and dangerous occurrences in the United Kingdom during the year 1908, it is stated that 239 cases of lead poisoning were reported among house painters and plumbers, not employed under the Factory and Workshop Acts. There were 44 fatal lead-poisoning cases during the year in these two classes. The number of fatal accidents in the construction of buildings was 114, as compared with 127 in 1907.

Trade and Craft.

Test of Reinforced Brickwork.

An interesting test of the "H.B." system of reinforcement, in which the brickwork is strengthened by means of wire-mesh reinforcement was recently made in Liverpool, in the presence of leading architects, surveyors, and representatives of the Press, by Messrs. Richard Johnson, Clapham, and Morris, Ltd., of 24 and 26, Lever Street, Manchester. For the purposes of the test a hollow storm wall was built, consisting of an outer wall of 4½in., a cavity of 1½in., and an inner wall of 3in., or brick-on-edge, making together a 9-in. cavity wall. Between two piers, 10ft. apart, was built a length of wall of this description, about 3ft. high, and about 3ft. above the ground—that is, the wall did not rest on the ground, but had beneath it about 3ft. of clear way between the piers, into which it was built on both sides. On the other side of one of the piers was a similar piece of walling, 5ft. long, supported cantileverwise—that is, at one end only. Common red bricks were used, and the mortar consisted of three parts sand to one part cement. The joints were reinforced in every course on the "H.B." system, the wire-mesh reinforcement being carried through the entire length of the wall and piers. There were no ties of any kind between the inner and outer walls. The brickwork having been allowed thirty-five clear days for setting, the test was begun by loading the span between the piers with 10,000lbs., and the cantilever portion with 5,040lbs. These loads remained in position for a clear day, when, on examination, no deflection was apparent. It was then decided not to increase the load on the centre span, but to test the cantilever to destruction. The load on the latter was then increased to 8,260lbs. without any sign of deflection. On the load being increased to 10,640lbs., the cantilever broke suddenly, without having shown any tendency to crack or deflect. An examination of the fracture showed that the bricks, where built into the pier, had sheared across, and the others had sheared away at the joint. Thus the wire-mesh reinforcement bore the tension strain of the load of 10,640lbs. Finally, the bricks of the cantilever wall gave way under the excessive shearing force, the wire-mesh reinforcement being likewise cut across. In a test for lateral resistance of a 4½-in. wall, a piece of brick wall, 3ft. long, 2ft. wide, and 4½in. thick, built and reinforced similarly to the walls described in the preceding test, was loaded. Nineteen clear days for the setting of the cement having been allowed, the slab was placed across two stone flags, with a bearing of 3in. at each side, thus having a clear unsupported span of 2ft. 6in. When the load amounted to 4,256lbs., a fine shear crack was noticed in the centre of the slab at one side. At 5,600lbs., a brick (entire) fell out on the opposite side to that on which the shear crack appeared. When finally the slab failed under a load of 7,448lbs., it was found to have cracked straight across, but rather on one side, this being accounted for by the support on one side sinking a little, and so causing the weight to be deflected.

Hamilton's Patent Window Fittings.

Strength, neatness, simplicity, and cheapness are claimed for the patent window fittings that are supplied by Messrs. W. L. Hamilton and Company, Ltd., of Cornwall Buildings, Newhall Street, Birmingham, who show in a series of interesting illustrations how their fittings are applied to old or new windows, and how they operate in hingeing ordinary sashes so that they may be opened inwards for cleaning, etc., and thus prevent risk of accidents and save money in window-cleaning contracts. The hingeing apparatus consists of two brackets and two pivots for each sash. The brackets are checked into the batten rod or parting bead, and screwed to the frame of the window, making their hold perfectly secure; the pivots being screwed to the sash. A small ledge on the pivot fits underneath the flanged edge of the bracket, making it impossible to raise the sash from the hinges while it is turned into the room. When the window is being opened inwards, the face plate, passing from the slipper to which it has been locked, draws forward a sliding bolt which projects through the keeper, thus holding the cord in position while the window is swung in to be cleaned. On closing the window again, the face plate, engaging with the clipper, pushes the bolt back into its original position, and the window can then be moved up and down the full way. The fittings are neat and unobtrusive, and do not detract from the appearance of the window. These fittings have been adopted on a large number of important buildings, including the Waldorf Hotel, the "Morning Post" building, and the Prudential Assurance Offices, London; and the Edinburgh Life Assurance Co.'s head offices, and many other large buildings in Edinburgh and Glasgow, including, in the latter city, the National Bank of Scotland, the Institute of Civil Engineers, and sixteen schools under the Glasgow Board.

Coming Events.

Thursday, March 18.

The Concrete Institute.—Mr. E. P. Wells, on "Concrete Arch Bridge Construction."

Leicester and Leicestershire Society of Architects.—Mr. A. Herbert, A.R.I.B.A., on "F. W. Ordish, Architect, and an Exhibition of his Drawings."

Friday, March 19.

Birmingham Architectural Association.—Mr. G. Salway Nicol, A.R.I.B.A., on "Rome and Paris: their Architectural Relations."

Architectural Association (18, Tufton Street, S.W.).—Mr. J. A. Marshall on "A Lesson from the Past," 7.30 p.m.

Saturday, March 20.

Edinburgh Architectural Association (117, George Street).—Visit to St. Triduana'a Well, Restalrig, and to Craigentinny House.

Monday, March 22nd.

University of London (South Kensington).—Mr. Banister Fletcher, F.R.I.B.A., on English Renaissance (and Modern) Architecture," 8 p.m.

Polytechnic (Regent Street).—Mr. S. Bylander on "Constructional Steelwork for Buildings."

Wednesday, March 24.

Northern Architectural Association (Newcastle).—Annual Meeting, Exhibition of Students' Work, and Presentation of Prizes, 7.30 p.m.

Edinburgh Architectural Association (117, George Street).—Mr. F. Morley Fletcher (Director of the Edinburgh College of Art) on "Materials and Treatment in Wall Decorations," 8 p.m.

Glasgow Institute of Architects (187, Pitt Street).—Symposium on Competitions.

Saturday, March 27.

Northern Polytechnic Architectural and Building Students' Association.—Visit to Messrs. Kirkaldy and Sons' Testing Works, 99, Southwark Street, S.E., 2.30 p.m.

Monday, March 29.

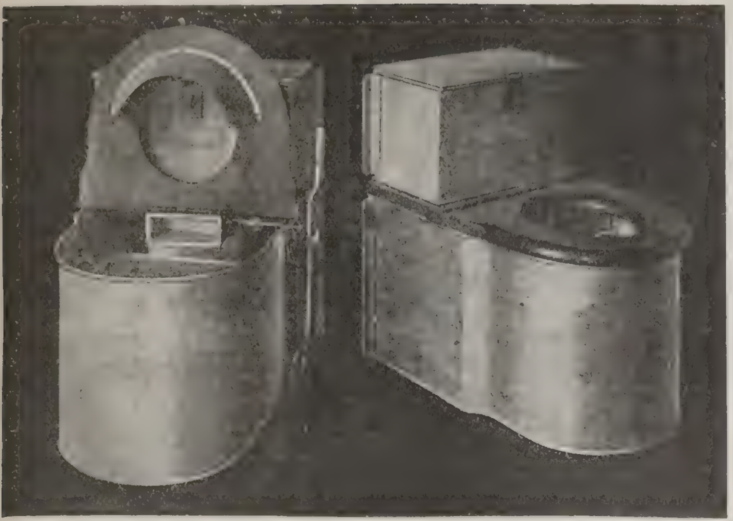
Royal Institute of British Architects.—Sir Aston Webb, R.A., F.R.I.B.A., on "Buildings for Higher Technical Education," 8 p.m.

Tuesday, March 30.

Builders' Clerks' Benevolent Institution.—Annual Dinner, Holborn Restaurant.

Wednesday, March 31.

Edinburgh Architectural Association (117, George Street).—Mr. James Ballantine on "Stained Glass," 8 p.m.



The "DOMESTIC."

FIG. 99. Earth Closet in Sheet Steel.

Shewn with lever to cause discharge of the deodorant, and also **automatic**—the latter type acting as the user rises from the Seat. Dry earth, sawdust, sand, or ashes may be used.

Price, plain Painted Body, and Galvanized Iron Earth Box, with Pitch Pine Varnished Seat	£3 10 0
If Automatic	3 15 0

If Mahogany Seat, add 5/- ; if Body Grained, add 7/6 ; if Body Galvanized, add 16/- ; if Body Galvanized and Automatic, add 25/-,

In this Earth Closet the pail is removed by lifting the lid, or by the back. In the latter case, an opening is provided in back wall of the building to permit this.

For other types and prices, write the manufacturers :

ADAMSEZ Ltd., SCOTSWOOD-ON-TYNE.

The BUTTERMERE GREEN SLATE CO., LTD.

KESWICK, Cumberland.

Supply the finest *Cumberland & Westmorland GREEN SLATES* from their Celebrated—

Honister and Yew Crags Quarries, Cumberland.
Original Elterwater Green Quarries, Elterwater.
Coniston Green Slate Quarries, Tilberthwaite.
Lingmoor Quarries and Highfellside Quarries.

in the following colours:—

LIGHT SEA GREEN,
DARK SEA GREEN,
OLIVE GREEN,
and other Shades.

WESTMORLAND GREEN SLATES.

Manufacturers of Green Stonework for Flooring Tiles, Flagging, Heads, Sills, Mullions, Steps, Memorials, and other Architectural specifications.

Write for Prices, Samples and other particulars with List of Roofs covered to

Head Office—

KESWICK,
CUMBERLAND.

Telegrams—"Buttermere Slate, Keswick."

— or to —

52, QUEEN VICTORIA ST., LONDON, E.C.

Telegrams—"Khoro, London." Telephone—8236 Bank.

LIFTS, CRANES, CRABS

REVOLVING SHUTTERS,
COLLAPSIBLE GATES,
SLIDING PARTITIONS.

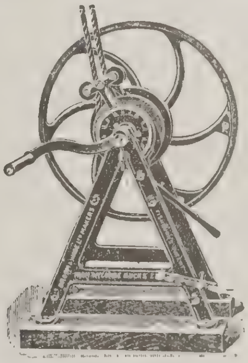
DENNISON, KETT & Co., Ltd.,

11, Queen Victoria Street, LONDON, E.C.

Iron Staircases, Doors and Sashes.

CATALOGUE FREE ON APPLICATION.

Telegrams: "Hoisters, London." Telephone, Bank 8356. A B C Code.



Reduce your Wages by using

BROOM & WADE'S

PATENT HOIST.

This is the most Efficient Hoist on the market for hoisting barrows of bricks, concrete, &c., without Gearing.

BROOM & WADE, LTD.,
Engineers, HIGH WYCOMBE.

TANK ROOF TO FACTORY 190 ft. by 57 ft.

The Chain Concrete Syndicate.

Constructional Engineers in Reinforced . . Concrete. . .

The most complete system in existence.
Every Member, Tension or Shear, RIGIDLY FIXED.
No Loose Bars to be misplaced during Concreting.

Fireproof Floors, Flat Roofs, Reservoirs, Culverts, Bridges,

Write for Pamphlet—

1, Basinghall Square, LEEDS, and Carlton Street, CASTLEFORD.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Amlwch.—For the erection of new schoolroom, library, vestry, etc., in connection with "Carmel" Welsh Congregational Chapel. Mr. Jos. Owen, F.R.I.B.A., architect and surveyor, Menai Bridge:—

	£	s.	d.
W. and R. Jones	£1,200	0	0
T. G. Prytherch	1,198	0	0
O. Thomas and Son	1,030	0	0
Griffith Pritchard,* Amlwch ...	900	0	0
J. Parry	777	0	0
J. Owen and W. Williams ...	766	18	9

*Accepted.

Birmingham.—Accepted for additions to factory, for the Birmingham Metal and Munitions Co., Ltd., Saltley, Birmingham:—

T. Johnson, Gt. Brook Street and Willis Street, Birmingham, £2,287.

Bristol.—For the main block of new buildings of the School of Industry for the Blind at Southmead, Bristol. Messrs. Edmeston and Gabriel, architects, London:—

E. Clark and Sons, Bristol	£27,440	... £650
Perkins and Sons, Bristol...	26,150	... 700
Downs and Son, Bristol ...	25,600	... 690
R. F. Ridd, Bristol ...	25,450	... 710
Walters and Son, Bristol ...	25,367	... 720
Chancellor and Son, Bath...	25,366	... 683
Stephens, Bastow and Co., Bristol	24,949	... 700
J. Long and Sons, Bath ...	24,944	... 650
W. Cowlin and Son, Bristol	24,928	... 711
E. Love, Bristol	24,925	... 715
Willcox and Co., Wolverhampton	24,875	... 750
Hayes and Son, Bristol ...	23,912	... 708
Wilkins and Son,* Bristol...	23,846	... 737
Lovell and Son, Bristol ...	23,600	... 630

*Accepted.

The sums in the second column of figures represent the additional cost of glazed tiling.

Farnham Common, Bucks.—Accepted for the erection of two detached cottages on Pin Lane, Farnham Common, Bucks. J. Wornell, architect, Slough, Bucks:—

Burfoot and Butler, Slough, £390.

Horrabridge, Devon.—For erection of two semi-detached houses at Queen's Park, Horrabridge. Messrs. King and Lister, architects, 8, Princess Square, Plymouth:—

	£	s.	d.
J. Hoskin, Horrabridge, S. Devon	£1,635	0	0
R. Wilkins and Sons, Bristol ...	1,535	0	0
Maddock and Sons, Tamerton Foliot	1,486	0	0
Cook Bros., Plymouth	1,459	6	7
S. Roberts, Plymouth	1,422	18	3
J. Kelley, Horrabridge, S. Devon	1,367	2	6
J. F. Badcock, Ashburton ...	1,364	2	7
J. Cockerell, Plymouth	1,311	0	1
F. J. Stanbury, Devonport ...	1,306	11	9
A. Andrews, Plymouth	1,264	0	0
W. P. Hill, Plymouth	1,230	6	11
Nankivell and Co., Whitchurch, Tavistock	1,223	13	10
J. Paynter, Plymouth	1,202	0	0
W. I. Stevenson, Plymouth ...	1,179	9	0
E. E. Endicott, Plymouth ...	1,146	15	3
T. R. Leaman,* 8, Eton Place, Plymouth	1,140	0	0

*Accepted.

Kingswood, Glos.—For alterations and additions to Kingswood Samuel White's Council School, for the Gloucestershire Education Committee. Mr. R. S. Phillips, architect, Midland Bank Chambers, Gloucester:—

Walters and Son	£1,187
Cowlin and Son	1,138
Ridd and Sons	1,073
J. Long and Sons, Ltd., Bath ...	1,042
C. A. Hayes and Sons	1,017
Adams and Jefferies	998
E. Clark and Sons*	985

*Accepted.

(*Tenders continued on page viii.*)

ROOFING SLATES.
Velinheli, Penrhyn and Westmorland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

(EST. 1887).
CITY OF LONDON
AND
FINSBURY DRAWING OFFICES
(LEWIS PITCHPINE, Manager),
Working Drawings,
Perspectives,
Designs,
Tracings,
Prints,
Quantities,
Telephone—1099 Central
Telegrams—"PITCHPINE, LONDON."
63, FINSBURY PAVEMENT, LONDON, E.C.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron Fire-Escape Stairs.
Premier Ironworks, DEPTFORD, S.E.

WRITE TO THE MANUFACTURERS
BAYLISS, JONES & BAYLISS, LTD.

WOLVERHAMPTON & LONDON.
LOW PRICES. CATALOGUES FREE. (NAME THIS JOURNAL.)

NOSTELL BRICK AND TILE WORKS,
MANUFACTURERS OF NR. WAKEFIELD.
TERRA COTTA in BUFF, RED, &c.
ROOFING AND FLOORING TILES.
Tel. Address: "WINN NOSTELL" Tel. No. 66, WAKEFIELD. Representative: FRANK TALBOT. West Leigh, Walton, near Wakefield.

X ELITE
CLARK & CO., 32a, Westminster Palace Gardens, S.W.
The Most Perfect Substitute for Keene's at almost the price of Lime
ONE material only required for both render and finish
A Perfectly Sanitary Fireproof Cement
PLASTER Telegrams: "CLARCOLITE, LONDON." Telephone: 5321 WESTMINSTER. Works: Newark-on-Trent, G.N.R.

FOLDING PARTITIONS. 2/- ft. Super.
REVOLVING SHUTTERS. 1/- ft. Super.
Hartley Bros., GORTON, MANCHESTER.

Do you have to compete for a job?

or

Do employers compete for your services?

It depends, of course, on what you can do. Is your work the kind which any number of people can perform? Then, obviously, there's no reason why your services should be sought.

Are you competent to undertake positions which few can occupy because you possess **specialised training?** Then necessarily you are in demand.

The question is, then—are you a **trained** or an **untrained** man? It makes all the difference—not only between choosing the post you would like and taking the job you can get—but also between high and low pay, between security and insecurity of employment, between peace of mind and harrowing uncertainty, between success and failure in life.

Happily the sure and simple way to **become** a **trained** man is opened to you by the International Correspondence Schools which exist for the one definite purpose of qualifying ambitious workers for the best positions in their chosen lines of work.

You study with the I.C.S. at home, in your spare time, by correspondence. You make the best possible use of your leisure—you waste no time attending classes—you are on sound "salary-raising" lines every hour you are studying.

Thousands of students have testified, during the past 17 years, to the way in which I.C.S. training has improved their positions. This is just typical:—

"Leicester.

"Since commencing the Complete Architectural Course with you I have been given control of the entire office business of Messrs........................... ......Contractors and Builders, Leicester. Before enrolling I was general book-keeper and cashier in the same office. My salary has been doubled.

"(Signed) Arnold W. Kerridge."

We also assist our students in the matter of Employment by means of our

"STUDENT'S AID DEPARTMENT,"

which is in touch with employers in every district and furnishes valuable introductions, recommendations, etc. You should get full particulars of the free service.

Mark the coupon or write us about any special career—NOW. That's

THE FIRST STEP TOWARDS MAKING YOURSELF IN DEMAND.

Residents of the following Countries should address the respective I.C.S. Branches:—

Canada—Toronto.
India—Fort Bombay.
South Africa—Cape Town.
New Zealand—Wellington
Australia—Sydney.
Italy—Salerno.
China—Shanghai.
Manila—Manila, P.I.
Honolulu—Honolulu.
Panama—Ancon.
Bermuda—Hamilton.
Straits Settlements—Singapore.
Porto Rico—San Juan.
Jamaica—Kingston.
Mexico—Mexico D.F.
Argentine Republic—Buenos Ayres

Manager, INTERNATIONAL CORRESPONDENCE SCHOOLS, Ltd., 82
(Dept. B.), International Buildings, Kingsway, London, W.C. And at Manchester, Birmingham and Glasgow.

I am interested in your System of Technical Training and desire to increase my earning power. Please send me, post paid free of charge, the Book covering the subject before which I have marked X on the Coupon, and full information showing how I can succeed in same.

Mechanical Engineering.
Architecture.
Electrical Engineering.
Structural Engineering.
Gas Engineering.
Machine Shop Practice.
Sanitary Engineering.
Textiles.
Civil Engineering.
Analytical Chemistry.
Mining Engineering.
Steam Engineering.
Preparation for Examinations.

Name

Street

Town...Occupation

17/3/09.

Practical Notes for Architectural Draughtsmen.

By ALFRED W. S. CROSS, M.A., F.R.I.B.A.,
and ALAN E. MUNBY, M.A., A.R.I.B.A.

Complete Set (27 Large Plates in a Portfolio), 12s.

POST FREE, 12s. 6d.

Prof. C. H. REILLY, of Liverpool University, says: "I think it is a very valuable book, and I hope it will find its way into most architectural offices."

THE "PRACTICAL NOTES" gives in most convenient form for use on the drawing board examples with concise rules, explanations and dimensions for preparing Designs, Perspectives and Working Drawings for Classical Architecture with rapidity and precision.

STUDENTS preparing for the examinations of the R.I.B.A. can learn how to draw The Orders correctly with the smallest possible amount of study and work by utilising the invaluable drawings and data given in this publication.

We shall be pleased to forward a copy of this work on approval to any of our subscribers.

THE MANAGER, TECHNICAL JOURNALS, LTD.
Caxton House, Westminster, S.W.

Descriptive Leaflet sent post free upon Application.

(Tenders continued from page vi.)

London, S.W.—For erection of working-class dwellings on the Grove Cottages site, Manor Street, for the Chelsea Borough Council:—

	£	s.	d.
Abbott and Charlton, Acton...	£20,534	14	0
T. Heath, South Eaton Place	18,500	0	0
Roberts and Co., Earl's Court Road	18,400	0	0
W. J. Fryer, Paddington ...	18,247	0	0
Frost and Son, Ealing ...	17,950	0	0
Griggs and Son, Cubitt Town	17,790	0	0
J. Allen and Sons,* Kilburn...	17,665	0	0
Holliday and Greenwood, Brixton	17,280	0	0
J. Appleby and Sons, Southwark Park	17,137	0	0
W. H. Hyde, Norwood Junction	16,965	0	0
A. Davis, Aldgate	16,800	0	0
J. A. Wallis, Albemarle Street	16,752	0	0
John Barker and Co., Ltd., Kensington	16,689	0	0
W. Pattinson and Sons, Ltd., Westminster	16,643	0	0
Kirk and Randall, Woolwich...	16,543	0	0
Strange and Sons, Ltd., Tunbridge Wells	16,490	0	0
G. H. Bailey, Chiswick... ...	16,391	0	0
F. J. Gorham, Greenwich ...	16,354	0	0
W. Johnson and Co., Ltd., Wandsworth Common ...	16,268	0	0
Spencer, Santo and Co., Ltd., Kensington	16,142	0	0
McCormick and Son, Essex Road	15,999	0	0
A. N. Coles, Westbourne Park	15,931	0	0
F. and G. Foster, Norwood Junction	15,898	0	0
W. Lawrence and Son, Waltham Cross	15,884	0	0
Patman and Fotheringham, Ltd., Theobald's Road ...	15,771	0	0
Jarman and Co., Richmond ...	15,595	0	0
F. G. Minter, Putney	15,570	0	0
B. E. Nightingale, Albert Embankment	15,414	0	0
J. Carmichael, Wandsworth ...	15,376	0	0
Wm. Downs, Walworth ...	15,300	0	0
Lole and Co., Chelsea	15,214	0	0
R. A. Lowe and Co., Chislehurst	14,772	0	0
Gathercole Bros.,* Norbury ...	14,688	0	0

*Accepted subject to certain conditions.
Architect's estimate, £17,571.

Nelson, Glam.—Accepted for the erection of a new Council school, for the Glamorgan County Council. Mr. D. Pugh-Jones, county architect, Cardiff:—

Hamilton and Millard, Caerphilly, Glam., £3,930.

Seaton, Devon.—For extensions to the Clarence Hotel, Seaton, Devon, for Messrs. Mitchell, Toms and Co., Ltd., Chard. A. W. Yeomans, F.R.I.B.A., architect, Cornhill, Chard:—

	£	s.	d.
A. Poole, Ilminster	£530	0	0
Newton and White, Seaton ...	526	17	6
T. Rider, Andover	510	0	0
Diment, Seaton	475	12	[illegible]
Richards, Seaton	460	10	0
R. G. Spiller,* Chard ...	445	[illegible]	[illegible]

*Accepted.

Solihull.—Accepted for erection of an isolation hospital, for the Joint Isolation Hospital Committee of Solihull and Meriden Rural District Councils. Mr. W. H. Ward, architect, Paradise Street, Birmingham:—

H. Gregory, Olton, near Birmingham, £8,240.

Taunton.—For erection of a detached residence for the head-master of Taunton School, for the School Council. Mr. F. W. Roberts, F.R.I.B.A., architect, 2, Hammel Street, Taunton. Quantities by the architect:—

	£
Pittard and Son	£2,265
E. G. Coles	1,980
H. Pollard and Son	1,971
H. J. Spiller and Son	1,970
W. Potter	1,949
F. J. Manning	1,894
G. Pollard and Co.	1,866
T. H. Moggridge and Son	1,860
A. J. Spiller	1,852
F. Small	1,820
H. G. Smith,* Taunton	1,784

*Accepted.

Tuckenhay.—For the erection of eight cottages, for Messrs. Millbourne and Co. Mr. W. F. Tollitt, architect, 10, High Street, Totnes:—

	£	s.	d.
Pethick Bros	£1,774	0	0
Selwood	1,769	11	6
Reeves and Son	1,577	0	0
Badcock	1,545	0	0
Brooks	1,500	0	0
Tozer	1,500	0	0
Leadman	1,444	15	0
Lewis,* Harbertonford	1,250	0	0
Horsman	1,150	0	0

*Accepted.

Wolverhampton.—Accepted for new shop front and internal fittings at 57, Dudley Street, for Messrs. Dunn and Co. Mr. E. A. Fermaud, architect, 59, Denbigh Street, Westminster:—

R. Speake and Sons £444

Wrexham.—For new church, including seats and boundary fence, at Hightown, Wrexham. Messrs. Prothero, Phillott and Barnard, architects, Cheltenham:—

	£
Lewis Bros.	£8,555
J. G. Woolley	7,345
W. E. Samuel	7,122
W. H. Wycherley and Co.	6,905
Gardner and Bradley, Manchester ...	6,959
A. H. Jones	6,744
A. J. Colborne, Swindon	6,580
R. Williams	6,579
Palmer Quarries, Ltd., Frodsham ...	6,557
J. Long and Sons, Bath...	6,447

Yardley.—Accepted for the kerbing, paving and road work in 25 streets, etc., for the Yardley Rural District, for Arthur W. Smith, Esq., engineer. Approximate cost, £3,000:—

G. Percy Trentham, 77, Booth Street, Handsworth, Birmingham.

Insurance.

Free £500 Accident Insurance Coupons have this week been sent to the following:

C. P. (Bexhill), C. L. G. (Nottingham), E. C. (Canonbury), A. P. L. (Strood), G. S. B. (Chelmsford), J. S. (Heckmondwike), W. F. D. (Westminster), R. C. J. (Tunbridge Wells), J. H. (Chatham), H. W. B. (Bath), N. K. (Egremont), D. P. M. (Lancaster), E. H. (Haltwhistle), A. R. H. (Westminster), A. W. (London, W.), W. K. B. (Manchester), W. G. (Bolton), R. G. H. (Bolton), J. P. (Stoke-on-Trent), J. I. (Gresford), H. E. A. (Carlisle), R. K. E. (Skipton), J. P. (Hampstead), A. C. R. (Gravesend), J. A. (Kensal Green), M. B. C. (Redruth), R. B. (Perth), W. H. S. (Sheringham), J. W. (Elgin), J. H. M. (Balham), H. A. R. (Erith), W. B. (York), F. A. T. (Scarborough), W. H. W. (Bristol), H. B. (Stourbridge), F. N. (Sheffield), T. R. (Sheffield).

A LIFE EXPERIENCE **THE COLLECTOR AND BUDD'S PATENT SYSTEM.** For 5s. 2d.

COMPETITION DEMANDS SUCH A WORK AS OFFERED HERE.

THE SAFEGUARD (can be started any week, and no waiting required). **THE PRACTICAL SHORT CUT TO OFFICE ROUTINE. 50 per cent.** of clerical labour saved. Not one penny can be lost. **Book-keeping dispensed with for practical workings. "Unique."** A great money saver, and the most simple, accurate, and genuine work that can be put before the public. Thousands of copies sold, and unsolicited testimonials coming daily to hand from all over England. The work is for **Builders, Contractors, Decorators combined, or for Carpenters, Bricklayers, Plumbers, Painters, Masons as separate Businesses, Engineers, Joinery Manufacturers, etc.** And for **5s. 2d.** the key of a week of business is sent, showing contract, jobbing and day work, plant, stock, own repairs, cartage and stables, trade and office expenses, and profit and loss accounts, worked out and at a glance. Prime costs of contracts and jobbing works guaranteed to the halfpenny. **Permit grants** for use are sent with systems, and the **system is not** transferable.

ATTENTION *is called to the following. J. STEVEN CALLENDER, Builder etc., of 31, Sugarhouse Lane, Greenock. Says, I must say that I have never seen a system of bookkeeping for the building trade so seriously and carefully planned to embrace every item so that nothing may go amissing. It is exceedingly simple, and will save a good deal of office time, and only a system such as you have devised can enable the small and large contractor alike to arrive at, with ordinary care, a true statement of his position at the end of the financial year. WM. BUTTRUM, Builder and Contractor, Hillingdon, Middlesex. "I am very pleased indeed, with your system as a time saver, it is very clear and straightforward, and I thank you for introducing the system to me." All Cheques and Postal Orders to be crossed and made payable to "The Collector Office" and addressed* 19, *Henniker Gardens, East Ham, E.*

J. G. HAMMOND & CO., LTD.,

PRINTING CONTRACTORS.

LONDON WORKS: 32 to 36, Fleet Lane, Ludgate Circus, E.C.
MIDLAND WORKS: Scotland Passage, High Street, and Moor Street, Birmingham.

SPECIALITY:

CATALOGUES of all kinds,
PUBLICATIONS of all kinds,
BOOKS of all kinds.

LARGE INSTALLATION OF LINOTYPE AND MONOTYPE COMPOSING MACHINERY,
ENGLISH, AMERICAN AND FAST ROTARY PRINTING AND FOLDING MACHINERY.

IMITATION TYPEWRITTEN CIRCULARS supplied with names and addresses typed in separately to match the body or alternatively so printed as to enable you to type in the names and addresses on your own typewriter.

SEND FOR ESTIMATES AND UNIQUE TESTIMONIALS.

The "Centenary" Petrol Gas Turbine Generator,

For Supply to a City or a Cottage.

THE CENTENARY GAS CO. (Dept. E), 11, QUEEN VICTORIA ST., LONDON, E.C., & 109, Hope St., Glasgow.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

March 18. DERBY.—Alterations to old slaughterhouses, Cattle Market, for the corporation. Plans, etc., of John Ward, M.Inst.C.E., borough surveyor, Babington Lane, Derby, on deposit of £1 1s. Tenders by noon on March 18, to the town clerk, 15, Tenant Street, Derby.

March 19-26. ELLAND.—Erection of three shops at Elland. Plans and bills of quantities from March 19 to 26, of C. H. Petty, architect, 12, Waterhouse Street, Halifax.

March 19. STARBECK.—Re-building St. Andrew's Church, Starbeck. Plans and specification at the church, and at the office of the architects. Bills of quantities on application to Wright and Son, surveyors, Lancaster. Tenders by noon on March 19, to Austin and Paley, architects, Lancaster.

March 19. ONLLWYN, near NEATH.—Erection of a large Welsh Congregational Chapel, school, and class-rooms, etc., at Onllwyn. Plans and specification with the secretary, W. T. Hughes, Birch House, Seven Sisters, Neath, or with W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff, where bills of quantities may be obtained on deposit of £3 3s. Tenders by March 19 to the Secretary.

March 19. CLECKHEATON.—Erection of a secondary and technical school, for the U.D.C. Specifications and bills of quantities, after March 6, on application at the town hall, upon deposit of £1 1s. Plans and details at the office of the architect, W. H. Thorp, Phœnix Chambers, South Parade, Leeds. Tenders, endorsed "Tender for—— Work," by 4 p.m., on March 19, to John H. Linfield, clerk to the council, town hall, Cleckheaton.

March 20. CARLETON.—Erection and completion of cowhouse for 32 beasts at Baits Hill Farmstead, Carlton, for W. J. Robson, J.P., Pontefract. No quantities. Plans, etc., and all information, at the office of the architect. Tenders by March 20, to James Heseltine, architect and surveyor, Old Castle Drawing Office, Pontefract.

March 20. STAMFORD.—Erection of a six-roomed cottage at Hudd's Mills, Uffington Road, Stamford, for the corporation. Particulars upon application to the borough engineer, town hall, on deposit of 10s. Tenders by March 20, to Fredk. R. Ryman, A.M.Inst.C.E., borough engineer, town hall, Stamford. Local builders invited to tender.

March 20. Gt. YARMOUTH.—Converting a disused boiler house into an able bodied men's dormitory, and other works at the workhouse, for the Guardians. Particulars at the architect's office, 171, High Street, Gorleston, on deposit of £1. Tenders through the post to the office of the board of guardians, 11, Queen Street, Great Yarmouth, by noon, on March 20.

March 20. RHYMNEY (MON.).—Enlarging the Middle Rhymney mixed council school, including alterations and improvements to existing buildings and erection of a cookery centre, for the Monmouthshire Education Committee. Tenders by March 20, to C. Dauncey, secretary, C.C. offices, Newport, Mon., from whom particulars may be obtained on deposit of £2 2s.

March 20. MANCHESTER.—Taking down and rebuilding retort house walls, etc., at the Rochdale Road gas station, for the Corporation. Particulars of C. Nickson, superintendent, gas department, town hall, Manchester, on deposit of £1 1s. Drawings and other information of J. G. Newbigging, M.Inst.C.E., Rochdale Road gas station. Tenders at the gas offices, town hall, Manchester, by noon on March 20.

March 22. CARRICKFERGUS.—Erection of a building, High Street, Carrickfergus. Plans and specifications at the offices of the architects. Tenders by 4 p.m., on March 22, to Samuel P. Close and Son, architects, 13, Donegall Square North, Belfast.

March 22. SLEAFORD.—Alterations and additions to the Wesleyan Church premises, Sleaford, for the trustees. Plans at the Wesleyan Church, Sleaford. Tenders to the Rev. E. Jope, Sleaford, by five p.m., on March 22nd. Quantities of A. E. Lambert, architect, 22, Park Row, Nottingham, on deposit of £1.

March 22. CONISBOROUGH, ROTHERHAM.—Erection of a new school at Conisborough, for the west Riding education committee. Plans and quantities, the architect, H. L. Smethurst, Conisborough, Rotherham £1 deposit to the West Riding treasurer, county hall, Wakefield. Tenders by 10.30 a.m., on March 22, to W. R. Hudson, divisional clerk, education offices, Mexborough, Rotherham.

March 23. GOVILON, near ABERGAVENNY. — Erection of a residence at Govilon, near Abergavenny, for Iltyd Gardner. Plans and specification at Neville Rooms, Abergavenny, and at the office of the architect. Tenders by March 23, to John W. Rodgear, architect, 14, High Street, Cardiff.

March 23. DARLINGTON.—Erection of a new school, to accommodate 420 children, on the Dodmire Estate, Eastbourne, Darlington, for the Corporation. Particulars of George Winter, borough surveyor, town hall, Darlington, on deposit of cheque £2 2s. Tenders by March 23, to Hy. G. Steavenson, town clerk, Houndgate, Darlington.

March 23. ISLINGTON.—Extension of stables and repairs to the roof at the depot, Liverpool Road, N., for the corporation. Drawings and specification, etc., on and after the 16th inst., upon application to the borough engineer, J. Patten Barber, town hall, Upper Street, N., and deposit of £2 2s. Tenders to Wm. F. Dewey, town clerk, town hall, Upper Street, N., by 4 p.m. on March 23.

March 23. LONDON.—(1) Execution of repairs and minor works in connection with fire brigade stations, offices, stores, and other buildings belonging to the L.C.C.; (2) erection of hoarding, shoring, fans, fencing, notice boards, etc., for the L.C.C. Full particulars in the "London County Council Gazette," March 8, to be obtained from P. S. King and Sons, 2 and 4, Great Smith Street, Westminster, S.W. Forms for (1) from the architect measuring surveyor's section, 19, Charing Cross Road, W.C.; and (2) from the valuer, 9, Spring Gardens, S.W., upon deposit with the cashier of £2 2s. and £1 respectively. Tenders to G. L. Gomme, clerk of the L.C.C., County Hall, Spring Gardens, S.W., by 11 a.m. on March 23.

March 24. LEEDS.—Erection of shelters to bowling greens at various parks and cricket pavilion at Roundhay Park, for the corporation. Tenders at the town clerk's office, by 10 a.m., on March 24. Particulars of W. T. Lancashire, city engineer, municipal buildings, Leeds.

March 24. HULL.—Construction in reinforced concrete of a swimming pond, 90ft. by 35ft., together with sub-structure of main building, 109ft. by 76ft., including foundations, floors, gallery, and main walls to gallery level, for the corporation. Forms of tender, etc., of A. E. White, M.Inst.C.E., city engineer, town hall, on deposit of £1. Prints of contract plans on payment of 5s., not returnable. Remittances to T. G. Milner, city treasurer. Tenders to the chairman of the baths sub-committee, at the town clerk's office, by March 24.

March 25. HOMERTON, E.—Erection of two house coal stores at the Eastern Fever Hospital, Homerton Grove, Homerton, E., for the Metropolitan Asylums Board. Particulars at the office of the board, Embankment, E.C., upon deposit of £1. Tenders by 10 a.m. on March 25, at the office of the Board.

March 26. DENNY.—Construction of new station buildings at Denny, for the Caledonian Railway Company. Drawings at the office of the company's engineer, Buchanan Street station, Glasgow. Specification and schedule on deposit of £2 2s. Tenders by March 26, to J. Blackburn, secretary, Caledonian Railway Company's Offices, 302, Buchanan Street, Glasgow.

March 27. GOLBORNE, NEAR WIGAN.—Alterations and additions at Parkside Mill School, Golborne, for the Lancashire education committee. Plans, etc., at the office of the county architect, on deposit of £2. Tenders before noon, on March 27, to Henry Littler, county architect, 16, Ribblesdale Place, Preston.

March 27. GUILDFORD.—Erection of a Nurses' Home for the guardians of the poor of the union. Plans, etc., at the offices of Edward L. Lunn, architect, 36, High Street, Guildford. Application, accompanied by deposit of £3 3s., to the architect, by March 18. Tenders by 9 a.m. on March 27, to W. S. V. Cullerne, clerk to the guardians, union offices, Commercial Road, Guildford.

March 29. QUEENSFERRY.—Re-roofing public baths with cement concrete and alterations and repairs, for the Corporation. The burgh surveyor will point out the work. Offers with the burgh chamberlain, Queensferry, by March 29.

March 29. CWMGWRACH, near GLYNNEATH.—Erection of 20 (or more) semi-detached houses at Cwmgwrach, for the Dunraven Building Club. Drawing and specifications at the office of the architect. Tenders addressed to the trustees by 5 p.m. on March 29, to J. Llewellin Smith, M.S.A., architect, Aberdare.

March 29. WIDNES.—Alterations to the Warrington Road Council School, Widnes, for the Corporation. Specifications on deposit of £1 1s., at the education department, town hall, Widnes. Tenders to the chairman of the sites and buildings committee, education department, town hall, Widnes, by noon on March 29.

March 29. BINGLEY.—Erection of a training college, at Bingley, for the West Riding Education Committee. Particulars of the West Riding architect, County Hall, Wakefield, on deposit of £1 to the West Riding Treasurer, County Hall, Wakefield. Tenders by 10.30 a.m. on March 29, to Francis Alvey Darwin, clerk to the C.C., County Hall, Wakefield.

March 31. HUNTINGTON.—Execution of (1) addition to the Ramsey Heights school; (2) addition to the Ramsey Forty Foot Bridge school; (3) enlargement of cloakroom and other works at St. Ives council school, for the Education Committee. Plans and specifications at the surveyor's office, 30, High Street, Huntingdon. Tenders by noon on March 31, to S. G. Cook, clerk to the committee, county education offices, Huntingdon.

March 31. WAKEFIELD.—Alterations and erection of new conveniences, Greasborough infants' provided school; conversion of stable into caretakers' house, Silsden Aire View provided school; asphalting playgrounds, Liversedge, Norristhorpe provided school; for the West Riding Education Committee. Particulars of the West Riding architect, county hall, Wakefield. £1 deposit in each case to the West Riding Treasurer, County Hall, Wakefield. Tenders by 10 a.m. on March 31, to Francis Alvey Darwin, clerk to the C.C., County Hall, Wakefield.

April 1. LONDON.—Erection of an operating-room at the infirmary, Dartmouth Park Hill, N., for the guardians of the poor of the Parish of St. Pancras. Drawings and specification of the architect, A. E. Pridmore, 2, Broad Street Buildings, E.C. Tenders by 10 a.m. on April 1, to Alfred A. Millward, clerk to the guardians, town hall, Pancras Road, N.W.

April 2. GLOUCESTER.—Erection of County Offices and alterations to the Shire Hall, Gloucester, for the C.C. Bills of quantities, etc., on deposit of £2 2s., and on application to Robert Phillips, consulting surveyor, Shire Hall, Gloucester. Tenders at the Shire Hall, Gloucester, by April 2.

April 2. CLYDACH.—Erection of an infants' school for 100 places, at Clydach, for the Breconshire Education Committee. Plans and specification at the county hall, Brecon. Bills of quantities on receipts of £2 2s. deposit. Tenders by noon on April 2, to Charles W. Best, M.I.C.E., surveyor to the Breconshire education committee.

ENGINEERING.

March 22. PRESTWICK.—Constructing a concrete sea wall, about 900 yards in length, with embanking, roads, and footpaths, for the T.C. Particulars of the engineer, William Cowie, Alloway Chambers, Ayr, on deposit of £1. Tenders by March 22, to William Shaw, town clerk, town clerk's office, Prestwick.

March 22. MILTON, LYMINGTON.—Erection of a ferro-concrete bridge over the stream at Fernhill, in the parish of Milton, for the R.D.C. Particulars of S. Crittall, surveyor, Sway. Tenders by March 22, to J. Davis Rawlins, clerk, 38, High Street, Lymington.

March 23. HANDFORTH, CHESHIRE.—Supplying and fixing a Cornish boiler at the Styal Cottage Homes, Handforth, Cheshire, for the guardians of the poor of Chorlton union. Specifications from the Manchester Steam Users' Association, 9, Mount Street, Albert Square, Manchester. Tenders by March 23, to David S. Bloomfield, clerk to the guardians, union offices, All Saints', Manchester.

March 23. LONDON.—Execution of engineering jobbing works, exclusive of works of a mechanical character, on a schedule of prices for a triennial contract, for the L.C.C. Particulars from the chief engineer of the Council, Maurice Fitzmaurice, C.M.G., County Hall, Spring Gardens, S.W., upon deposit of £1 with the cashier. Tenders, marked "Tender for Engineering Jobbing Works," by 11 a.m. on March 23, to G. L. Gomme, clerk to the L.C.C., County Hall, Spring Gardens, S.W.

IRON AND STEEL.

March 19. HOLLESLEY BAY, SUFFOLK.—Supplying about forty tons of light rails to the colony at Hollesley Bay, Suffolk, for the Central (Unemployed) Body for London. Forms of tender at the offices of the Central Body. Tenders by 10 a.m. on March 19, to Fred. E. Johnson, clerk to the Central Body, 1[illegible]6, Temple Chambers, Temple Avenue, London, E.C.

PAINTING.

March 20. MANCHESTER.—Painting various bridges over canals and rivers in the City, for the Corporation. Specification and form of tender on application at the city surveyor's office, town hall, Manchester, on deposit of £2 2s. with the city treasurer. Tenders to the chairman of the paving, etc., committee, city surveyor's office, by 10 a.m. on March 20.

March 23. LONDON.—Cleansing and re-painting Westminster Bridge, for the L.C.C. Particulars on application to the chief engineer, Maurice Fitzmaurice, C.M.G., County Hall, Spring Gardens, S.W., and deposit of £1. Tenders by 11 a.m. on March 23 to G. L. Gomme, clerk to the L.C.C., County Hall, Spring Gardens, S.W.; fair wages clause.

March 24. LEEDS.—Execution of painting works and repairs at Cobble Hall, for the Corporation. Particulars of W. T. Lancashire, city engineer, municipal buildings, Leeds. Tenders by 10 a.m. on March 24, to the town clerk's office, Leeds.

March 25. RAINHILL, LANCS.—Painting all external wood and iron work at the main buildings, and all other properties and buildings, for the Lancashire Asylums Board. Tenders by 5 p.m. on March 25, to Jas. Gornall, clerk and steward, clerk's office, Rainhill Asylum.

March 27. CLIFTON, YORK.—Painting and decorating the church at the North Riding asylum. Tenders by March 27, to the committee of visitors, North Riding Asylum, Clifton, York.

PLUMBING & SANITARY

March 23. PLYMOUTH.—Re-construction of common drain in the rear of 1 to 65, Mainstone Avenue, for the Corporation. Tenders by 5 p.m. on March 23, to James Paton, borough engineer, Municipal Offices, Plymouth, from whom all particulars may be obtained.

March 24. BRAINTREE, ESSEX.—Construction of sewerage and sewage disposal works for the U.D.C. Plans at the office of the engineers, Sands and Walker, Milton Chambers, Nottingham, and conditions, specification, and quantities, on deposit of £3 3s. Tenders by 10 a.m. on March 24, to Herbert J. Cunnington, clerk to the council, Braintree, Essex.

March 27. ASHBORNE (DERBYSHIRE).—Construction of new stoneware and iron pipe sewers, dortmund and septic tanks, filter beds, etc., for the U.D.C. Plans of the engineer, W. H. Radford, C.E., Albion Chambers, King Street, Nottingham, on deposit of £3 3s. Plans, specifications, and quantities also at the surveyor's office, town hall, Ashborne. Tenders by March 27, to R. Williams, clerk to the council, council offices, Ashborne.

ROADS AND CARTAGE.

March 19. RUISLIP-NORTHWOOD.—Execution of certain repairs in Dene Road, Northwood, for the U.D.C. Specification and form of tender from W. Louis Carr, surveyor, council offices, Northwood, Middlesex. Tenders by noon on March 19, to Edmund R. Abbott, clerk to the council, Northwood, R.S.O., Middlesex.

March 19.—EASTRY.—Supply and delivery of surface and approved dug flints, and re-carting stones from depots, for the R.D.C. Also steam rolling with ten-ton rollers. Apply to the district surveyor, D. E. Foster, Hazel Bank, Eastry, Dover; or the assistant surveyor, W. Goodsell, Durlock Road, Ash, Dover. Tenders, by March 19, to Fred. S. Cloke, clerk to the council, the workhouse, Eastry, near Dover.

March 20. IPSWICH.—Steam rolling and scarifying by the day, for the East Suffolk C.C. Particulars on application to M. Miller, M.Inst.C.E., county surveyor, 16, Museum Street, Ipswich, to whom tenders by March 20.

March 20. IPSWICH.—Supplying broken granite, quartzite and flints at various railway stations, docks, and quays, for the East Suffolk C.C. Tenders by March 20. to H. Miller, M.Inst.C.E., county surveyor, 16, Museum Street, Ipswich, from whom all particulars may be obtained.

March 20. REPTON.—Supply broken granite, limestone, slag, broken boulders, and local gravel, during the year ending March 31, 1910, in various parishes, for the R.D.C. Also carting. Full particulars from the clerk, T. R. Sidgwick, surveyor of highways, by March 20, to C. F. Chamberlain, clerk, Union Offices, Burton-on-Trent.

March 20. HALIFAX.—Execution of private improvement works in Emscote Estate, for the Corporation. Plans and specifications, and form of tender, of James Lord, M.I.C.E., borough engineer, town hall, Halifax, upon deposit of £5. Tenders, endorsed "Emscote Estate," by noon on March 20, to Keighley Walton, town clerk; fair wages clause.

March 22. SEDGEFIELD, FERRYHILL.—Leading road materials for the year ending March 31, 1910, for the R.D.C. Particulars of W. R. Plews, highway surveyor, Sedgefield, Ferryhill, to whom tenders must be sent by March 22.

March 22. BATLEY.—Levelling, paving, channelling, and completing ten streets for the Corporation. Particulars of the borough engineer and surveyor, Oscar J. Kirby, town hall, Batley. Tenders by March 22, to J. H. Craik, town clerk, town clerk's office.

March 22. BOLSOVER.—Supplying slag, limestone, etc., for the ensuing year, at Bolsover, Clowne, Markham, Oxcroft Sidings and Norwood Sidings, for the U.D.C. Tenders at price per ton at each station, and endorsed "Cinders," by March 22, to G. E. Carline, clerk, 2, New Square, Chesterfield.

March 22. SCULCOATES.— Supplying Whinstone granite and gravel for the year ending March 31, 1910, for the R.D.C. Particulars from A. Greaves, surveyor, Woodbine Villa, Hessle. Tenders, by March 22, to Jas. Fras. Robinson, solicitor, clerk to the council, 4, Parliament Street, Hull.

March 22. ROWLEY REGIS.—Supplying for one or three years, from April 1, Rowley Regis broken road stone, kerbs, squares, randoms, etc., for the whole district. Specifications at the council offices, Lawrence Lane, Old Hill, until March 20. Tenders by noon on March 22, to Daniel Wright, clerk to the council, council offices, Old Hill, Staffs.

March 22. BOLSOVER.—Supplying materials and work in metalling, paving, curbing, channelling, and draining Railway Side Street, for the U.D.C. Plans and specifications of W. G. H. Browne, Ivan House, Bolsover. Bills of quantities on deposit of £1 1s. Tenders, marked "Tender for Streets," by March 22, to G. E. Carline, Clerk to the U.D.C., 2, New Square, Chesterfield.

March 22. KIMBERLEY, NOTTS.—Levelling, forming, metalling, asphalting, kerbing, channelling, etc., streets in the parish of Kimberley, Notts., for the Basford R.D.C. Particulars of Geo. W. Hawley, surveyor to the council, Burton Buildings, Parliament Street, Nottingham, on deposit of £1 1s. Tenders by March 22, to Henry Stone, clerk to the council, Public Offices, Basford, Nottingham.

March 23. ESTON.—Excavating, roadmaking, surface water drainage, cement concrete walling, kerbing, and channelling, for the U.D.C. Particulars of C. McDermid, district surveyor, council offices, Grangetown, S.O. Yorks, where bills of quantities may be obtained on deposit of £1 1s. Tenders by March 23, to Thomas Belk, clerk to the council, council offices, Whitworth Road, Grangetown, S.O.

March 24. MINSTER, near RAMSGATE. —Supplying 2,548 yards broken flints, 1,450 tons broken granite, for the Isle of Thanet R.D.C. Apply to G. L. Butterworth, surveyor, Birchington. Tenders by March 24, to Chas. Taylor, clerk, Board Rooms, Minster, near Ramsgate.

March 24. LONGTON.—Forming, kerbing, channelling, paving, etc., streets, for Corporation. Tenders, addressed to the chairman of the improvement committee, by March 24, to J. W. Wardle, C.E., borough surveyor, Court House, Longton, of whom particulars may be obtained.

March 24. BARTON-UPON-IRWELL.—Supplying during the year ending March 31, 1910, setts, kerbs, macadam, flags, limestone chippings, sanitary pipes, and road brushes, for the R.D.C. Form of tender on application to the surveyor at Patricroft, to be delivered by 10 a.m. on March 24, to J. W. Whitworth, clerk, union offices, Patricroft.

March 27. POCKLINGTON.—Supplying best blue stone and slag for repairing roads throughout the district for the R.D.C. Particulars of Thos. Robson, clerk, Pocklington, to whom tenders are to be sent by March 27.

March 27. HORSHAM.—Supplying about 3,500 cubic yards of flints, and about 3,800 yards of granite, or other approved stone; also carting, for the R.D.C. Apply to the surveyor, Wm. Dengate, 58, Park Street, Horsham. Tenders by March 27, to A. C. Coole, clerk, 9, Carfax, Horsham.

March 27. GATESHEAD.—Supplying the following materials for one year, for the corporation: Whinstone macadam, granite macadam, whin setts, whin curb, whin channel, whin wheelers, limestone macadam, freestone curb and flags, metal gullies, manhole covers, etc., shovels, picks, scavenging brooms, lime and cement. Specifications, etc., of N. P. Pattinson, borough surveyor, town hall. Tenders by noon, on March 27, to W. Swinburne, town clerk.

April 3. STRETFORD.—Paving with setts granited rock, asphalt, etc., six streets and passages, for the U.D.C. Particulars of Ernest Worrall, the council's surveyor, on deposit of £2 2s. (cheque). Tenders to the chairman of highways, council offices, Old Trafford, by April 3.

April 3. MIDDLETON.—Supplying setts, flags, sanitary tubes, granite, macadam, cast-iron manholes and street grids, waste water closets, and lime, during the year ending March 31, 1910, for the Corporation. Particulars of W. Welburn, borough surveyor, town hall, Middleton. Tenders, addressed to the chairman of the surveyor's committee, by April 3, to Frederick Entwistle, town clerk, town hall, Middleton.

MISCELLANEOUS.

March 18. STAFFORD.—Supply and cartage of road materials, tools, and road implements for the six districts in the county, viz., Leek, Newcastle, Uttoxeter, Stafford, Lichefild, Sedgley, to March 31, 1910, for the C.C. Particulars of James Moncur, Chief surveyor of main roads, County Buildings, Stafford. Tenders at the offices of the clerk of the Council, County Buildings, Stafford, by March 18.

March 19. LONDON.—Taking up and relaying new floor in nurses' home, Raine Street, E., for the parish of St. George-in-the-East. Apply to R. Murray Lochner, clerk, Raine Street, Old Gravel Lane, E., to whom submit tenders by 2 p.m., on March 19.

March 20. PONTEFRACT.—Supplying materials for the year ending March 31, 1910, for the R.D.C. Forms of tender from T. Dickson Smith, clerk to the council, union offices, Pontefract, to whom tenders with samples of materials are to be submitted by March 20.

March 20. EXETER.—Execution of work and repairs, and supply of materials, as ordered by the guardians, one year from Lady-day next. Apply to R. M. Chalice, surveyor to the guardians, 14, Bedford Circus, Exeter. Tenders by March 20, to Arthur Snell, clerk to the guardians; 10s. 6d. deposit.

March 20. MAIDSTONE. — Supplying shovels, forks, scavenging brooms, scoops, scrapers, cart grease, tallow, oil, and other tools and materials, for the Kent C.C. Particulars and forms of tender on application to the county surveyor, West Borough Chambers, Maidstone. Tenders, endorsed, "Tenders for Tools," by noon, on March 20, to W. B. Prosser, clerk to the C.C., Sessions House, Maidstone.

March 20. BURNLEY.—Supplying setts (local), flags, kerb, channel, bricks (red), gravel, granite macadam, cement, pitch, creosote, earthenware pipes, limestone, street grates, etc., lime, ironwork, etc., etc., for the year ending March 31, 1910, for the Corporation. Particulars on application to G. H. Pickles, M.I.C.E., borough engineer, town hall, Burnley. Tenders, addressed to "The Chairman of the Highway and Sewage Committee," at the town clerk's office, town hall, Burnley, by March 20.

March 24. LEEDS.—Supplying shoulder boards, etc., and stone flags for the Corporation. Particulars of W. T. Lancashire, city engineer, Municipal Buildings, Leeds. Tenders by 10 a.m. on March 24, to the town clerk's office, Leeds.

March 24. LANARK.—Supplying (1) tools and implements, (2 fencing materials, and (3) drain pipes; also cement, for a period of one or three years, from May 15, for the District Committee. Apply to James Watson, road surveyor, Strathaven; John Clarke, road surveyor, Hamilton; William A. Chapman, road surveyor, Airdrie; or the Clerk. Specimen tools and implements at the road surveyors' offices, Strathaven, Hamilton, and Airdrie, on March 12. Tenders by March 24, to W. E. Whyte, district clerk, Hamilton.

March 29. PORTSMOUTH.—Altering doors and frames in the town hall and supplying and fixing panic bolts, for the Corporation. Particulars at the borough engineer's office at the town hall. Tenders by 10 a.m. on March 29 to Alexander Hellard, town clerk, town hall, Portsmouth; fair wages clause.

March 29. EDINBURGH.—Supplying the following material for the electricity supply department for the year from May 16:—Bitumen, lead-covered paper insulated copper cables, arc lamp carbons, arc lamp globes, house service fuse boxes, electricity meters, cast-iron pipes and pavement boxes. Particulars at the engineer's office, Dewar Place, Edinburgh, on deposit of 10s. Tenders by March 29, to the town clerk, City Chambers, Edinburgh.

Works in Progress and Completed.

BALLMONEY.—The church of St. James' has been re-opened after renovation that is expected to cost about £1,300. The architect was Mr. W. J. Gilliland, F.R.I.B.A., Belfast, and the work has been executed by Mr. Albert McMaster, Ballymoney.

EDINBURGH.—The contract for the erection of the new slaughter-houses at Gorgie has been awarded to Messrs. James Kinnear, Sons, and Company, Edinburgh, whose estimate is £30,608. Messrs. Kinnear state that they will complete the work in ten months. Their estimate was the lowest of fourteen offers.

ILFRACOMBE.—Work in connection with the new post office at Ilfracombe has been begun by Messrs. Woodman, of Exeter, who are the contractors. Employment has been given to local men, and the cost of the new buildings is estimated at £3,500.

WREXHAM.—The Wrexham Church Extension Committee have now accepted the tender of Messrs. W. Bowers and Co., of Hereford, to erect the Hightown Church at £6,210. The new church will be in the Early Perpendicular style. It is understood that a gentleman has intimated to the vicar his intention to defray the whole cost of this church so as to facilitate the carrying out of the entire scheme, which will require an outlay of £16,000.

THE
Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
30, Cross Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE architect prepares designs, perspectives, working drawings, etc., on moderate terms.—W., 6, King's Road, Kingston-on-Thames. 4918

ADVERTISER (28), seeks re-engagement, ten years' thorough practical knowledge of building, estate management, and repairs, etc.; experienced in preparing plans and estimates, including quantities, for new works: highest refs. — Y., 86, Coniston Road, Muswell Hill, N. 4805

APPOINTMENT as Improver (19), prob. R.I.B.A., just completing three years' articles with an architect and surveyor; small salary to commence; highly recommended.—H. Cullerne, "Bridge House," Lugwardine, Hereford. 4911

ARCHITECT and Surveyor's Assistant, P.A.S.I. (22), working drawings, surveying and levelling, taking off, abstracting and billing quantities, drainage and sanitation; general office routine.—George A. Taylor, Aston Road, Wem, Salop. 4892

ARCHITECT'S Assistant desires engagement, finalist R.I.B.A.; design, details, specifications, 1st class honours, quantity surveying, honours (Part 1), building construction, artistic and practical; moderate salary.—Address Architect, 24, Brunswick Street, C.-on-M., Manchester. 4871

ARCHITECT'S Assistant (23), excellent Draughtsman, desires re-engagement; London preferred; six years' first-class experience town and country work; contract, detail, and competition drawings; exhibitor Royal Academy; Prizeman for Architectural Design; small salary.—F. E., 10, Cobham Road, Kingston-on-Thames. 4876

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECTS, Builders, etc., draughtsman (19), used to general work, fill up time in office; good references.—F. J. Williams, c/o F. Cundall, Architect and Surveyor, 34, Parade, Leamington Spa. 4878

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. 4888

ARCHITECT'S Assistant (27), excellent draughtsman and colourist; contract drawings, specifications, details, design, perspective, surveys, etc.; travelling studentship winner; highest refs.—Box 4902, Builders' Journal Office.

ARCHITECT'S Assistant, 23, 6 years' experience in various London offices, good references; moderate salary.—G.O.E., 72, St. Ann's Hill, Wandsworth, S.W. 4881

ARCHITECT and Surveyor's Assistant (21), seeks re-engagement; 5 years' experience in church and domestic work in larger provincial office; good draughtsman and colourist.—Box 4823, Builders' Journal Office.

ARCHITECT'S Junior Assistant (19), 4 years experience in West End Office, working drawings, details, perspectives, competitions, excellent references; salary 21s.—Box 4777, Builders' Journal Office.

ARCHITECT'S Assistant (25), R.I.B.A. exam., nine years' thorough practical experience, design, working drawings, details, specifications, estimating, quantities, levelling, perspectives, etc.; sal. moderate.—Apply, Box 4900, Builders' Journal Office.

ARCHITECT'S Assistant, thoroughly experienced, temporary employment; domestic work, business premises, schools, etc.; surveying and levelling, etc.; two years' experience in Structural Engineer's office; salary moderate. — Box 4820, Builders' Journal Office.

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

ARCHITECT'S Junior Assistant, 5½ years' experience; disengaged; working and detail drawings, typewriting, knowledge of perspective; moderate salary.—W. L. Francis, 11, Middleton Road, Ilkley, Yorks. 4891

ARCHITECT, estate agent, or builder's assistant, experienced in all branches; good references.—R. S., Eagle House, Marine Parade, Clacton-on-Sea. 4816

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, Builders' Journal Office.

BUILDERS' Assistant desires situation; thorough knowledge plans, specifications, quantities, measuring; not afraid of work; salary not so much an object as permanent situation; 21; 5 years' experience.—Box 4839, Builders' Journal Office.

BUILDER'S Assistant or Manager; thoroughly efficient; moderate salary if prospect of hard work and exceptional ability being recognised; 23 years' experience.--Alpha, 191, Park Crescent, Grimsby. 4877

BUILDERS', Surveyors' Assistant (24), capable and reliable, seeks re-engagement, thorough practical knowledge of construction, surveying, measuring up, good draughtsman, supervision, also costs, accounts, wages, etc.; mod. sal.—Box 4841, Builders' Journal Office.

BUILDERS' Assistant desires work; plans, estimates, setting out buildings, measuring up, prime costing, surveying, and levelling plots, ordering exact quantities, materials; 11 years' experience.—Box 4803, Builders' Journal Office.

BUILDER'S or Architect's Junior Assistant (18), good tracer, well up in prime cost, and general office work; excellent references; three years' experience. — J. W., 164, Wellesley Road, Ilford, Essex. 4833

BUILDER'S Clerk and Assistant (20) requires situation; good draughtsman and colourist, certificates advanced construction, bookkeeping, typewriting and general routine; excellent references. —C. E., 59, Rosebery Gardens, Harringay, N. 4904

BUILDER'S clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N. 4883

CARPENTER and Joiner desires sit.; bench, building or estate, or other suitable capacity; experienced; good refs.; age 30.—R. H. W., 24, Thorncroft Road, Fratton, Portsmouth. 4908

CLERK of Works seeks re-engagement; just finishing public building; varied experience, notably ferro-concrete construction; well recommended; testimonials most excellent; age 45.—A. B., Box 4814, Builders' Journal Office

DRAUGHTSMAN (junior), 5 years' experience in structural engineers, good knowledge of constructional and ornamental work, details, quantities and estimating; shop experience.—M.D., 74, Bartholomew Road, London, N.W. 4884

DRAUGHTSMAN, neat, quick tracer, working drawings from rough sketches, good colourist; shorthand, typing, etc.; about 12 years' varied experience; terms moderate.—Box No. 4889, Builders' Journal Office.

ESTATE Owners.—Bricklayer, all-round, stonewaller, and general repairs; abstainer; good references; moderate wage for permanency.—Quinton, 12, Holland Road, Aston, Birmingham. 4802

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, Builders' Journal Office.

FOREMAN Painter (working) seeks re-engagement); experienced in all class work in building trade, as for general alterations, etc.; good supervisor, and reliable; either town or country; abstainer.—X. Y. Z., 8, Barton Street, Westminster. 4807

GENTLEMAN, with office in Glasgow, splendid connection among architects, builders, etc., is open to represent one or two good firms; first-class references given.—Box 4893, Builders' Journal Office.

GENERAL Foreman seeks re-engagement; alterations or new, practical experience in all branches; carpenter and joiner; good references; age 36; moderate wages.—Caplen, 3, Victoria Mansion, Edgware Road, Paddington, W. 4779

GENERAL Foreman seeks re-engagement, thoroughly practical and reliable; new or alterations; carpenter and joiner; life abstainer; first-class references.—Foreman, 3, Hawbridge Road, Leytonstone. 4787

GENERAL or builder's foreman, energetic, reliable, good timekeeper, trade bricklayer; age 32. Good refs.—G. C., 44, Richmond Park Road, Kingston-on-Thames. 4863

JUNIOR Assistant desires situation, home or abroad; good practical knowledge of construction and details; competent draughtsman and colourist, working drawings, measuring and supervising, surveying and levelling; moderate salary.—Box 4613, Builders' Journal Office.

MACHINIST seeks situation; spindle fourcutter, etc.; married, age 32; total abstainer and good timekeeper.—Machinist, 46, Priory Street, Tonbridge, Kent. 4874

PAINTING, paperhanging, distempering, graining wanted, piecework, new work at greatly reduced prices; specimen showing architects' and surveyors' testimonials for quality and cheapness.—Galton, 6, Parolles Road, Upper Holloway, N. 4861

PLASTERER, good jobbing bricklayer, roofs, fire work, stoves, tiling, etc., etc., generally useful, good reference, moderate wages, non-union.—A. Trigg, 117, St. John's Hill, Clapham Junction, S.W. 4856

QUANTITY Surveyor's Assistant (21), 4 years' experience, desires engagement, certificates and good references. — Apply Box 4745, Builders' Journal Office.

QUANTITY, General Surveyor's Junior Assistant, four years' experience; working up measuring existing buildings, good draughtsmen, little estate work; City Poly student.—J. R. O., 233, Essex Road, N. 4844

REINFORCED CONCRETE.—Details, drawings, calculations, and assistance generally, rendered to architects, builders, etc., by a specialist of large experience; terms moderate.—Box 4887, Builders' Journal Office.

SURVEYOR'S Assistant seeks re-engagement, 9 years with City firm; highest references; surveys; levels, estate management, etc.; shorthand and typewriting, if necessary. — J. P. K., 21, First Avenue, Manor Park, Essex. 4873

TO Estate Owners, builder, experience, in all trades, desires position as manager (working or otherwise); plans prepared, quantities, setting out, accounts and supervision; abstainer; country preferred.—Box 4806, Builders' Journal Office.

VOLONTAIRE.—Foreign gentleman (21) desires position in builder's office, with opportunity of learning.—B. B., 43, Bolingbroke Grove, Wandsworth Common, S.W. 4789

WORKING Foreman wants job, capable, energetic, thoroughly understands plans and setting out of buildings, etc., and taking full control of all branches; twenty years' experience; age 35; just finished job; trade, carpenter and joiner; not afraid of work; wages required, £3 per week. —Apply Box 4906, Builders' Journal Office.

Appointments Vacant.

ARTICLED Pupil—Reinforced Concrete. Required a young gentleman as articled pupil in reinforced concrete specialist's office, one with a knowledge of elementary applied mechanics, and mathematics and a taste for theory of construction and design preferred; an excellent opportunity for one willing to learn and understudy chief engineer.—Write, R. C., c/o Hastings Bros., Ltd., King's Chambers, Portugal Street, Kingsway, W.C. 4907

ARTICLED PUPIL.—Vacancy for same in old established West End firm of architects and surveyors; moderate premium; small progressive salary to suitable youth.—Box No. 4890, Builders' Journal Office.

FIRST-CLASS Architectural Assistant wanted for Lancashire; good designer, surveyor; quantities, working details; permanency to competent man; state age, salary and references to Box No. 4897, Builders' Journal Office.

MESSRS. OLIVER AND DODGSHUN, Architects, Carlisle, have a vacancy for a competent junior assistant; send particulars of age, training, qualifications, and salary required. 4901

WANTED at once, reliable clerk of works, masonry job; about 5 months, £3.—Wainwrights and Heard, Shepton Mallet. 4914

March 24, 1909. Volume 29. No. 737.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: The Horse Guards' Parade; Selfridge's, 247; America's Example; Copyright in Architecture - - - - - 248
The Grand Manner in Architecture. By Professor C. H. Reilly, M.A., F.R.I.B.A. 249
Notes on Competitions - - - - - - 255
Tests of Rolling Shutter Doors - - - 255
Proposed New Works - - - - - - - 255
Federated Employers - - - - - - 255
Institute Members' Club - - - - - 255
Coming Events - - - - - - - - 255
George Devey and his Work. By James Williams - - - - - - - - - 256
Incorporated Clerks of Works' Association: Annual Dinner - - - - - - - 257
Enquiries Answered: Proposed Roof Truss; Designing a Sunday School; Construction of Cesspool; Foundation to Walls, 259; Strength of Church Roof; Property in Old Material; Fungus Growth on Floor; Bankrupt Members of Local Authorities - 260
Architectural Societies - - - - - - - 261
Obituary - - - - - - - - - - - 261
Views and Reviews: The Art of the Plasterer, 261; Popular Electricity; The Use of the Slide Rule - - - - - - - - 263
Notes and News - - - - - - - 263
Federation News - - - - - - - - 264
Tenders - - - - - - - - - vi., viii.
Complete List of Contracts Open - - xvii-xix.

ILLUSTRATIONS.

Model of Argentine Republic Monument. M. Chedanne, Architect; M. Gasq, Sculptor - 249
Designs for a Campo Santo by Students of the Architectural School, Liverpool University: By Lionel B. Budden, 250; by H. A. Dod, 251; by E. Campbell Lemon, 252; by E. Prestwich, 253; see also Centre Plate.
The New Palace of Justice, Rome - - 257
Roof Trusses - - - - - - - 259, 260
Ceiling at Audley End - - - - - 262

The Horse Guards' Parade. "London is a great city, but a city of lost opportunities. The eye is frequently offended, may be by a street or place with no architectural principle in its axial setting out, by some building of inappropriate design, or by the grouping of buildings without due regard to their relation to one another." With this terse but perfectly appropriate visualisation of the London of to-day, Mr. F. W. Speaight commences his introductory remarks in a well-written, well-illustrated, and well-printed *brochure*, descriptive of the proposals now before the public for the adornment of the Horse Guards' Parade and its immediate surroundings. Commenced in the year 1745, after the designs of Kent, and completed (by Vardy) eight years later, the range of buildings known as the Horse Guards' occupies the site of an old guard-house (dating from 1641), erected for the accommodation—there being then no standing army—of the "Gentlemen-Pensioners" who formed the royal guard previous to the reign of the second Charles. As to the surroundings of the buildings, with which we are more immediately concerned, according to the Hon. Mrs. Evelyn Cecil ("London Parks and Gardens"), the most brilliant days of St. James's Park began in the reign of Charles II., by whom it was entirely remodelled shortly after the Restoration. Imbued, after his many years of exile, with French tastes in art, French customs, and French proclivities in ornamental gardening, Charles is credited with having sought the aid of the famous Le Notre, the personal favourite of Louis XIV., when remodelling St. James's Park. However, although Mrs. Cecil can find no proof that the *Grand Monarque's* premier landscape gardener was ever in England, it appears to be tolerably certain that the St. James's Park of the early days of the Restoration was taken in hand by French gardeners, who laid out and planted its shady avenues, formed the Mall and Birdcage Walk, and constructed what was held to be not the least of its many attractions, a canal 2,800 ft. long and 100 ft. broad, planted on either bank with a fine avenue of trees. Indeed, this canal was esteemed the principal feature of what Pepys called "the brave alterations" made in the park, to which he paid more than one visit during the progress of the works. In 1827, when the rage for landscape gardening was at its height, and, as Mrs. Cecil reminds us, the sight of a straight canal had become intolerable, a contemporary writer was loud in his praise of Eyton, who planned and executed the alterations which "converted a Dutch canal into a fine flowing river with incurvated banks, terminated at one end by a planted island and at the other by a peninsula." The principal feature of Mr. Speaight's scheme for the improvement of the present desolate open space, the ugliness of which, as "The Yorkshire Daily Observer" remarks, "has been so obtrusive that the neglect of generations of authorities to take any steps to improve it must have been a source of wonder to many," consists of an enormous *place* or parade ground, approximately cruciform in plan, and bounded, on its western side, by a large semicircular terrace raised some five feet above the general level of the ground. This apse-like termination of the *place* is designed to afford convenient standing room for an immense number of sight-seers; whilst the parade ground itself, enlarged to the extent of at least one-third of its present area, would become one of the most spacious in Europe. Broad radiating avenues, placed at the inter-section of the semicircular and straight boundaries of the parade ground, lead, on the north, to the Duke of York's Column, and, on the south, to Storey's Gate. A canal 500 ft. long and 40 ft. wide, placed, approximately, on the site of the original one, extends from the main central line beyond the circular terrace of the parade ground to the new park entrance at Marlborough Gate. This canal would be bounded on both banks by broad walks, and separated from the park beyond by high-clipped hedges, containing semicircular alcoves designed for the reception of groups of statuary to commemorate British military heroes from King Alfred to Sir John Moore. Finally, the suggested new road, proposed to be placed on the south side of the central canal, brings the whole scheme into harmony with the existing Mall. Planned on sound architectural lines, and shown to the greatest possible advantage by some beautifully executed drawings from the facile pencil of Mr. C. E. Mallows, this admirable scheme for the adornment of the Metropolis is to be heartily commended to the serious attention of all lovers of London.

Selfridge's. The opening of Selfridge's last week has been, naturally enough, the occasion of much discussion of the architectural merits of the building. Architects do not seem quite able to make up their minds about the exterior; but the balance of opinion is favourable. There was doubtless much wisdom in the choice of style. The taste for French architecture being decidedly in the ascendant, it follows as a natural consequence that various writers have expressed admiration for what in the "Times" is described as "a considerable touch of the feeling gained by the men who have studied in the Ecole des Beaux-Arts in Paris; a style," he adds, "almost unknown in this country, though recently made somewhat familiar by the Ritz Hotel and 'Morning Post' buildings." The same writer thinks that the genesis of the building could be traced back to the old Custom-house at Rome, whose facade was formed by a row of eleven columns that originally formed part of a Temple of Neptune. Its genealogy, however, may be left to the investigations of the curious in such matters. So also may the designation of its style. That it can be rightly called "French Renaissance" has been denied. It has been pointed out that French Renaissance is markedly different, having for its most characteristic feature a high-pitched roof—in the earlier period sharply pointed and peaked, and later assuming the Mansard form. Other differences need not be insisted upon; they will probably please more persons than they offend, more especially those who deprecate servile imitation, "lest one good custom should corrupt the world." Franco-American Renaissance would perhaps be an approximately accurate description. The important point in æsthetics is—and upon this there is apparently a general agreement—that this large building is decidedly not repulsive. Its front is not without stateliness and dignity, with a touch of tasteful elegance both in the proportions and in the details, redeeming it from all suspicion of heaviness. Also it offers a solution (which is perhaps not final) of the great and vexatious plate-glass problem. A huge superstructure, depending apparently on the support of its abnormal expanse of plate-glass windows, is a sight that never fails to arouse the indignation of all lovers of architectural propriety, who hold that things should be what they seem. Thus genuine artistic susceptibilities will not be greatly shocked by the ground-floor windows at Selfridge's, where the proportion of voids to solids is not only actually but visibly just, offering to the timorous a most substantial assurance of stability. The front offers a more tentative and much less positive solution of yet another important problem—that of the architectural treatment of steel-framed buildings. It may be conceded that the Selfridge building presents a handsome frontage; but the decorative effect is obtained by means of the Portland stone, with which the steel supports are clad. The massive columns in this case, however, are weight-carriers, and not merely ornamental pilasters. The interior, which is planned as much on the American system as the eccentricities of the obsolescent London Building Acts, plus a few slight concessions by the L.C.C., would allow, will no doubt be closely studied by all who are interested in this class of building; and we are glad to have the opportunity of publishing in several issues a series of plans that, taken as a whole, afford a valuable indication of the best that is being done in modern arrangement and construction of this particular type.

America's Example. Mr. Swales, in his interesting paper read before the R.I.B.A. on the 15th, appeared to be a little overweighted by his title. And in truth any attempt to compress into the limits of an Institute lecture such an overwhelming subject as American architecture was foredoomed to compromise if not to failure. And Mr. Swales compromised by confining his survey to the city of Washington, taking its town-planning and its public buildings as generally representative of the United States. When one considers the various articles on the same subject that Mr. Swales is publishing in the "Architectural Review," and which have only, as yet, given an indication of the commercial architecture of the country, one can easily appreciate the difficulties with which he was beset. For though the history of American architecture is short, the vitality, originality and development of its manifestations are astounding. The contemplation of it all may—nay, should—fill us with discontent. We cannot be surprised if our feeble attempts at public and civic architecture should excite some amount of derision among our brethren over the water. At the same time we have our excuses; and the "Times," in an able leader on Mr. Swales' paper, draws attention to one of them. "The ugliness of many of our modern buildings," says the writer, "is the result not of any want of talent in the architects, but of parcimony in the employer, and when the employer demands a great show at a little expense, the result is a vulgarity for which he alone is responsible." It is a difficulty with even the educated layman (and, too often, alas! with many architects), that they cannot appreciate any spiritual side to the art. "Architecture," says Mr. Swales, "has been defined as the mirror of a people's needs, aspirations and enlightenment." And the "Times" adds:—"We are content for the most part if our buildings express our needs. We will not spend enough money on them to make them expressive of our aspirations. This may seem to be a poor way of putting the matter. But it is certain that no architect, whatever his genius, can produce a fine building if he is only allowed just so much labour and material as will enable him to solve his material problem, if he is forced to use the cheapest of everything." It is the unhappy fate of architecture that it can advance no faster than the intellectual and artistic intelligence of the people. Of all arts, it, most of all, depends upon public encouragement and favour. The great task before architects is to educate the public and themselves, but first of all they must obtain public respect for themselves, and their art. One could wish that Mr. Swales' paper, and others we have heard, could be read to lay audiences, in place of the dry descriptions of mediæval buildings which the University Extension lectures afford. Mr. Swales rapped home the truth again and again as some of America's fine new buildings were shown upon the screen. "Here is a building just about the size of the new London County Hall; it has cost about £4,000,000." The architects present could add the unspoken sting when they remembered the beggarly £800,000 allowed for the future seat of London Government. And Americans spend these vast sums upon their buildings because IT PAYS them to do it. We wonder when that profound truth will sink sufficiently into the public mind for English public architecture to get its chance. But the keen American business man wants the best architecture he can get for his money, and usually he does get it. He trusts his architect, and is slow to interfere with him. He employs a good man, and believes that is the best way to achieve his end. And his faith is justified by the results.

Copyright in Architecture. A deputation that waited on Mr. Asquith the other day with the object of urging the advisability of legislative action that would secure to architects protection against the copying of the buildings they design, did not receive very much encouragement. At the first glance, their position seems to be theoretically sound enough. Why should not an architect, equally with an author and a picture-maker, be safeguarded against the piracy of his work? Why should he, or any man, be robbed of the fruits of his ingenuity and industry? The question seems to be perfectly legitimate, and the attitude perfectly equitable; and the demand has been conceded in other countries. But nevertheless Mr. Asquith could hold out no prospect of redress. This result is not at all surprising to those who have disinterestedly weighed the pros and cons. The matter is not nearly so simple as on the surface it seems; nor is the hardship to architects as a body so great as some of them doubtless have special reasons for feeling it to be. Broadly speaking, it is no greater, perhaps, than that of any other author or artist who has the good fortune to set a fashion which contemporary workers greatly admire and strenuously endeavour to imitate. Of course, the cases are not exactly on all fours. A writer of fiction, for instance, may imitate a style and method that have proved successful, and may even follow pretty closely the plot and the characterisation that he admires, or that have won the approval of the critics or of the public. But the imitator does not copy his model, or any portion of it, word for word and line for line; whereas in the practice of architecture it may admittedly sometimes happen that an admired feature is copied almost "line for line." In the case of large and important buildings, this does not matter to the originator of the detail. He is not one penny the worse for the plagiarism, and may even feel flattered by it. It is in the case of the smaller buildings that the real grievance arises. If ingenious A excogitates a beautiful villa, and thickheaded B, about whom (as the American poet has it) "there is nothing original, except original sin," runs up fifty or a hundred exact copies of it, perhaps in shoddy and disgraceful material, A is entitled to consider himself robbed and outraged; and, alas! he has no remedy. The speculative building owner is too often guilty of this form of piracy, the architect's share of the profits on scores of houses being the price of one set of designs. This is a kind of traffic that one would like to see stopped promptly and finally; but unfortunately it seems to be beyond the wit of man to devise a remedy that would not be worse than the disease. The case against architectural copyright has been well stated by a decidedly sympathetic but far-seeing writer in the "Yorkshire Daily Observer," who says: "The argument that the matter is practicable rests on a case in which in Copenhagen a judge denied copyright to a building held to have no artistic merit or original character. A legal phrase like that in an English law might be made by an acute judge to mean much more than even the architectural fraternity have foreseen, and their last state might be worse than their first. Parliament, when it commenced to legislate on copyright, granted the privilege only to works having permanent literary value. The judges themselves, and not Parliament, stretched it to cover all literary productions, good, bad, and indifferent. A similar judgment on architectural copyright might stifle advance equally in the higher artistic work and in the not less necessary work of improving the homes of the poor." That, we think, is a very fair statement of the difficulties in the path. The request for protection is always met with the objection that it would be against the public interest. Nevertheless, if architects as a body really feel and can prove that they are labouring under a really scandalous injustice, they must make a united and a determined effort to get it removed; and they must not shrink from publicity as they seemed to do with respect to the deputation to Mr. Asquith, about which very few people seem to have heard anything.

ROYAL ACADEMY EXHIBITION, 1909.

The day for sending in architectural drawings to Burlington House is Friday, March 26th, from 7 a.m. to 10 p.m. As in past years we shall be happy to act as agents for delivering drawings to the Academy on the condition that we are allowed to reproduce any of the designs passing through our hands prior to their being sent in. We should appreciate the kindness of architects in forwarding their drawings as early as possible, and would mention that we can obtain more satisfactory results in the reproduction when we have plenty of time at our disposal.

Drawings for exhibition in the architectural room should be glazed and should have gold frames. Each frame must have a ticket pasted on the back, giving the number, title of the work, and the architect's name and address, to correspond with the particulars given on the printed forms, which must be obtained from the secretary at the Royal Academy, Burlington House, Piccadilly, W., and there should be attached to each frame, by string, a printed label (also supplied by the Academy) so arranged that it may hang over the front of the drawing. The printed form of advice should in all cases be forwarded to us to hand to the Secretary on delivery of the drawings. No exhibitor may send more than three works, and we should recommend intending exhibitors to avoid wide margins or mounts to the drawings, as space is a considerable factor in the arranging of the architectural exhibits.

THE GRAND MANNER IN ARCHITECTURE.

By Professor C. H. Reilly, M.A., A.R.I.B.A.

Architects who still read Sir Joshua Reynolds's discourses must often be struck by the fact that the generalisations and principles of art expounded by that versatile artist apply at the present time with much greater pungency and force to their own art than to the art he himself practised. From these generalisations, architecture, unlike poetry and music, is somewhat conspicuously and intentionally excluded, and it is clear from the one direct reference to it (in mentioning the work of Vanbrugh) that Reynolds largely misunderstood both its motives and its possibilities. From the few remarks he there makes, we may gather that he looked upon it as a sort of permanent scene-painting, a useful background for historical pictures, something to be seen and admired from one standpoint only.

Reynolds and the Great Style.

In spite of this, it is yet conceivable that the man who could draw so clear a distinction, as he does in his fourth discourse, between what he calls the great style and those he designates as the merely ornamental styles, who in short set so great a store upon abstract qualities, would have found in monumental buildings, had architecture been his life's work, just those qualities to which he pays such eloquent homage, but which are noticeably absent from his own canvases. In stone, in the 18th century, to be merely pretty would have been a more difficult task than it is to-day, with the widespread use of such materials as terra cotta, and, what I may call, whether it is executed in that material or not, terra-cotta detail. The temptation to Reynolds, therefore, to forsake the great style he advocated, might have been less in architecture than it proved to be in pictures primarily designed for the saloon or the boudoir.

The Grand Masters.

Before going on to consider how Sir Joshua defined this "great style," which he separated as something apart from and above all other styles, let me explain briefly why I venture, in applying his definition to architecture, to translate his term, "the great style," into "the grand manner," a translation for which I feel some apology is needed. It is, as may be guessed, because architects and archæologists in the past have so often mistaken the mere accidents of style for style itself, and have thereby degraded the term from that of an abstract quality to a name for a catalogue of the minutiæ, by which they would distinguish the building technique of one period from that of another. Style is in itself a quality in the appeal an object makes to the imagination, and by the somewhat grandiloquent term "the grand manner," I desire to draw attention to a distinction which, till the present day, has in various degrees been common to almost all the so-called architectural styles—a quality well defined, I think, by Reynolds in his fourth discourse.

The Great Aim in Art.

In this lecture, given, like the others, to a mixed audience of architects, sculptors, and painters, at the annual prize giving at the Royal Academy, Reynolds, before describing those qualities of mind and method which go to the production of painting in the great style, lays down the axiom, clear enough when stated, but apt in practice to be lost sight of among the multifarious buildings a modern architect is called upon to design, that the great end of every work of art is to make a direct appeal to the imagination; and he goes on to say that there must be no ostentation in the means by which this is done; the spectator is only to feel the result in his bosom. "An inferior artist is unwilling that any part of his industry should be lost upon the spectator. He takes as great pains to discover, as the greater artist does to conceal, the marks of his subordinate assiduity. In works of the lower kind everything appears studied and encumbered; it is all boastful art and open affectation." The ignorant often part from such pictures "with wonder in their mouths," and, Reynolds adds, though I doubt it, "indifference in their hearts." Frith's "Derby Day" would still draw a crowd if exhibited anywhere but in the National Gallery, and the vulgar stop and gape at, and may not always forget, the multi-coloured absurdities of certain recent buildings that it might be thought invidious to name.

Attributes of the Great Style.

Reynolds then goes on to point out the more abstract qualities attaching to "the great style," such as breadth of treatment, generalisation of detail, both in figure and landscape, the suppression of anything that may conflict with the main conception. "To give a general air of grandeur at first view, all trifling or artful play of little lights or attention to a variety of tints is to be avoided, and quietness and simplicity are to reign over the whole work." How admirably these words would apply to a building like Somerset House, and how well we know the way in which this repose is nowadays broken into by some piquant detail, fresh from Scotland or Vienna, inimical alike to any real quietness or simplicity.

But it is

In the Matter of Drapery

that Reynolds's description of the "grand manner," as the exposition of a single big idea, is most clearly seen. The exponent of such "does not debase his conceptions with minute attentions to discriminations of drapery. It is the inferior style which marks the variety of stuffs. With him [the painter in the great style], the clothing is neither woollen nor linen, nor silk nor satin, nor velvet; it is drapery; it is nothing more."

Insignificant Detail.

I think we see at once that this has a very direct analogue in architecture of the nobler sort. Just as we do not stop to inquire the material with which a Sibyl of Michel Angelo's is robed, neither do we make haste to recognise the honeysuckle in the necking of the Erechtheion capital, or the acanthus leaf as the root form of early English carving. But, more than this, in neither of these cases is it the carved ornament that first catches our eye. "The sublime," as Reynolds further says, "impresses the mind at once with one great idea; it is a single blow; the elegant indeed may be produced by repetition; by an accumulation of many minute circumstances." And, finally, after condemning the Venetians, who nevertheless were to a great extent his masters, as

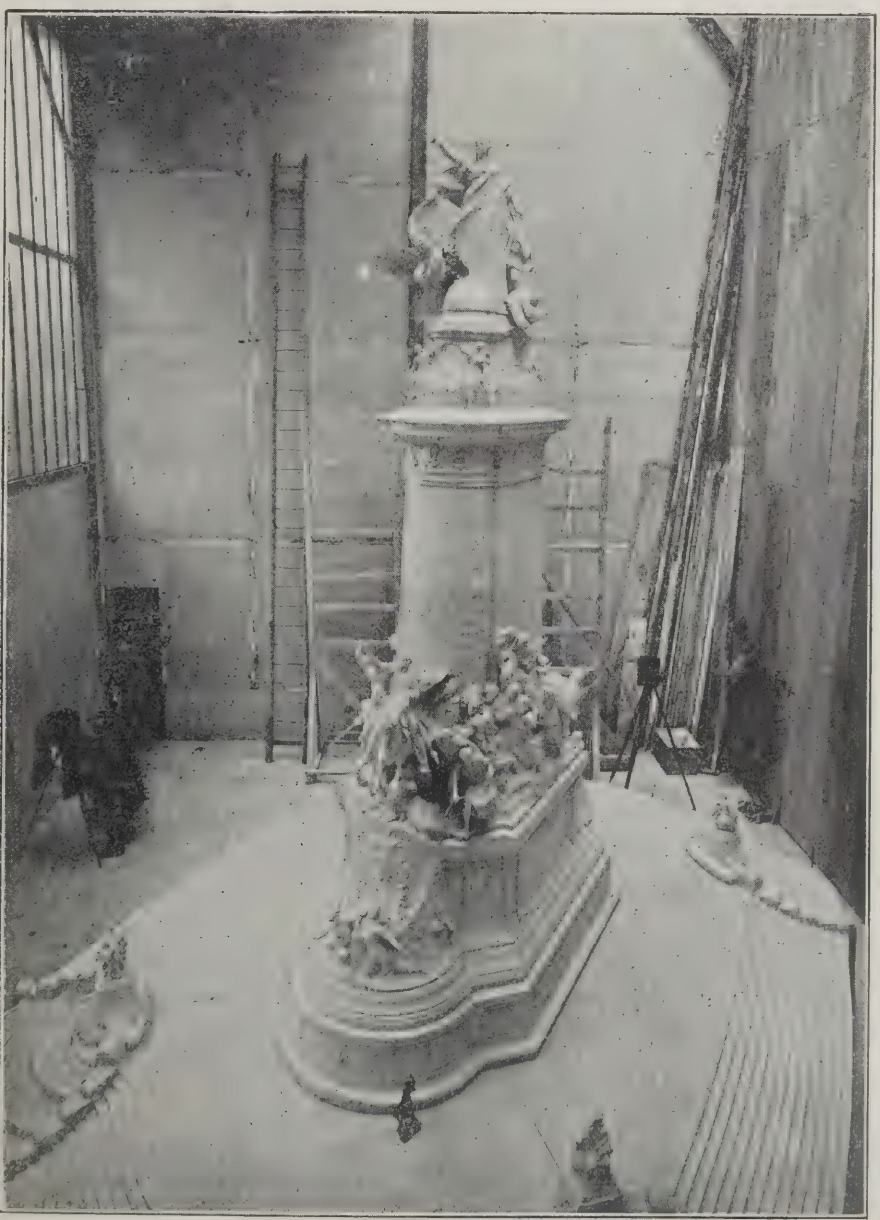


Photo: Topical.

MODEL OF THE MONUMENT TYPIFYING THE INDEPENDENCE OF THE ARGENTINE REPUBLIC, TO BE ERECTED AT BUENOS AYRES IN 1910. MM. CHEDANNE AND GASQ, OF PARIS, ARCHITECT AND SCULPTOR, RESPECTIVELY.

Note.—The scale of the finished work is shown by the figure in the foreground.

mere ornamentalists, he ends his discourse with this fine passage, which, if we understand his phrase "general nature" aright—that is, as a generalisation or abstraction from nature—a convention based on natural objects such as Claude used in his landscapes—we may apply with hearty goodwill and almost entire condemnation to a very large amount of modern building.

A Fundamental Principle.

"On the whole, it seems to me that there is but one presiding principle which gives stability to any art. The works, whether of poets, painters, moralists, or historians [or, we add, of architects], which are built upon general [that is, generalised] nature, live for ever; while those which depend for their existence on particular customs and habits, a partial view of nature, or the fluctuation of fashion, can only be coeval with that which has raised them from obscurity. Present time and future time may be considered as rivals, and he who solicits to one must expect to be discountenanced by the other."

Painting Parts Company with Architecture.

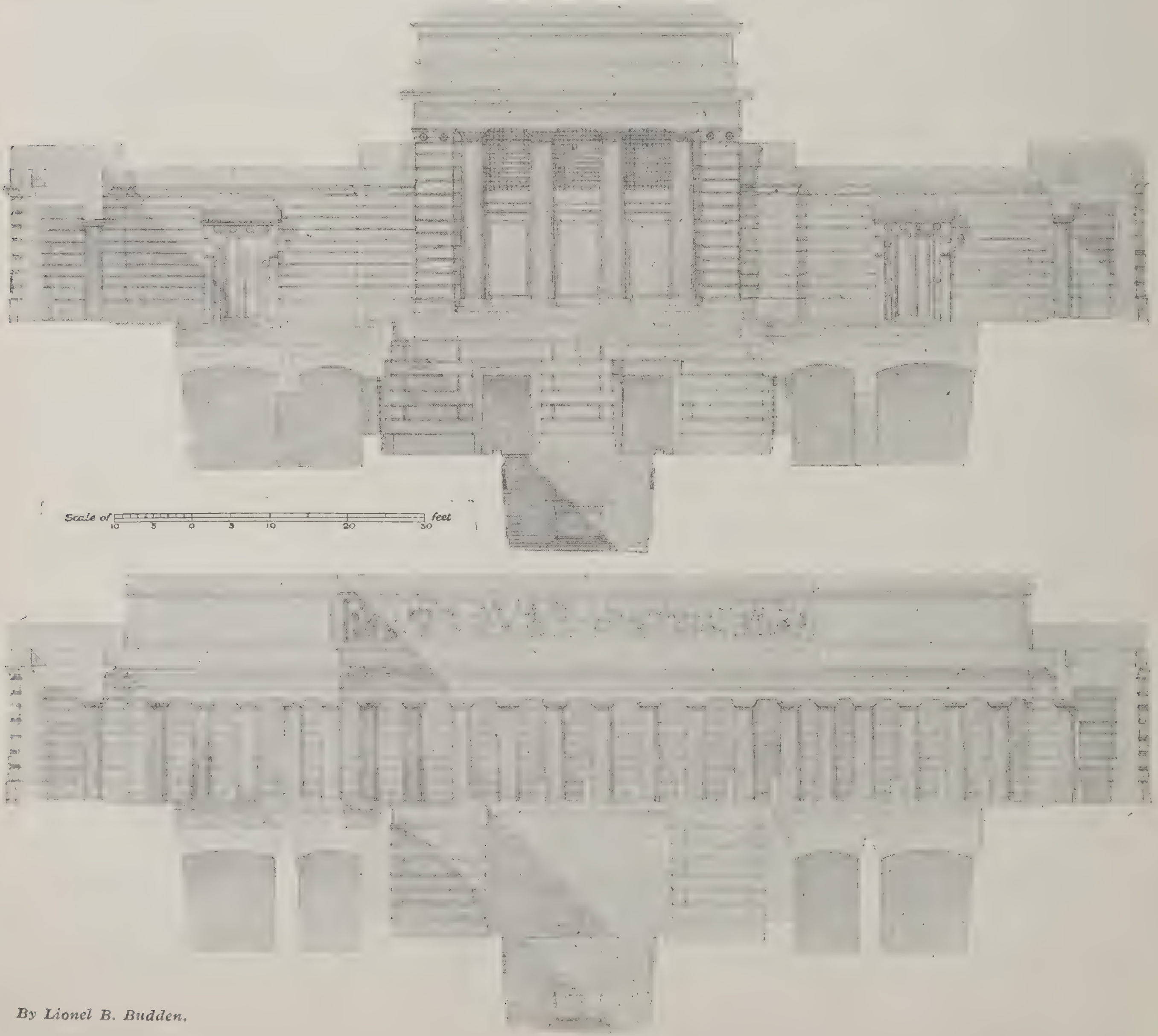
It may be admitted at once that the great style in painting as Reynolds conceived it, after a last flickering of life with Watts, has died, assisted to its death, perhaps, by the meagre opportunities and support given to it by modern architects. Painting, though, as painting, has had since then new fields opened to it; it has been born again into a new world with Manet, into a new atmosphere with Whistler. New vistas of life have been opened before it, new revelations of beauty have been disclosed by it, but it has parted company with architecture, and pictures have become like other precious objects—books and furniture—so much bric-à-brac, to be moved with impunity from room to room, or from building to building.

Reynolds's Principles Applied.

Returning however to architecture, we may, I think, safely lay down Reynolds's principle of unity as the first essential of the grand manner. A building must present to the imagination a complete and finished idea, however numerous its parts, however complex its purposes. A test of perfection is the impossibility of altering even to minor masses or detail. To take a very simple illustration of what is meant by unity, a good building viewed as a whole cannot be separated into two ideas, one of plan and the other of elevation; they must each be the natural outcome of the other. A plan is an architectural conception as much as a facade; no beauty of detail can compensate for badly shaped or badly arranged spaces, for these lead to badly shaped and badly arranged masses. We hear too much nowadays of the architect who can plan and the architect who can design. No architect can design who cannot plan architecturally, and no architect can really plan—that is, plan to make architecture—who cannot design too.

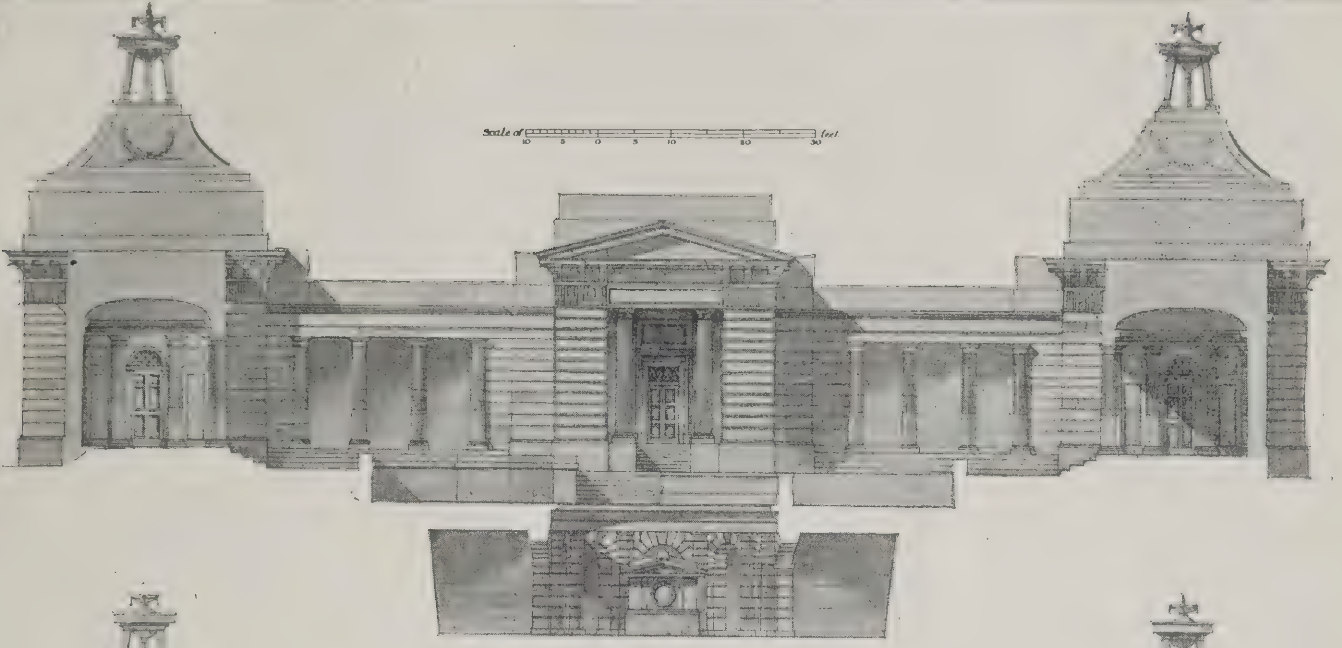
Unity of Conception.

I am not now speaking of the minor conveniences of planning, those matters of detail and common sense into which some men can put so much more energy and interest than others, and by which, unfortunately for architecture, competitions are so often decided. I am speaking rather of a plan as the root form of a building, the shape or series of shapes from which all the main masses are derived and obtain their meaning. The plan in this sense is far more essential to the completed conception than either exterior or interior elevation. By unity of conception, then, is meant that, however many parts a building may have, they must all be organised members or limbs of one body. There is no doubt that in laying down this principle for painting, Reynolds has stated the first essential of all great building likewise. The second essential to this supreme distinction corresponds to Reynolds's limitation of the great style to paintings of historical or mythological subjects, a distinction that in painting, however, no one would maintain to-day. We can, nevertheless, see the real point Reynolds had in his mind, and this can be applied to architecture, if it no longer holds good in painting. It is that those pictures belong to the great style in which the majesty of the human figure is insisted upon; or, if we may transfer a term from architecture, those in which there is a large and an ample scale.

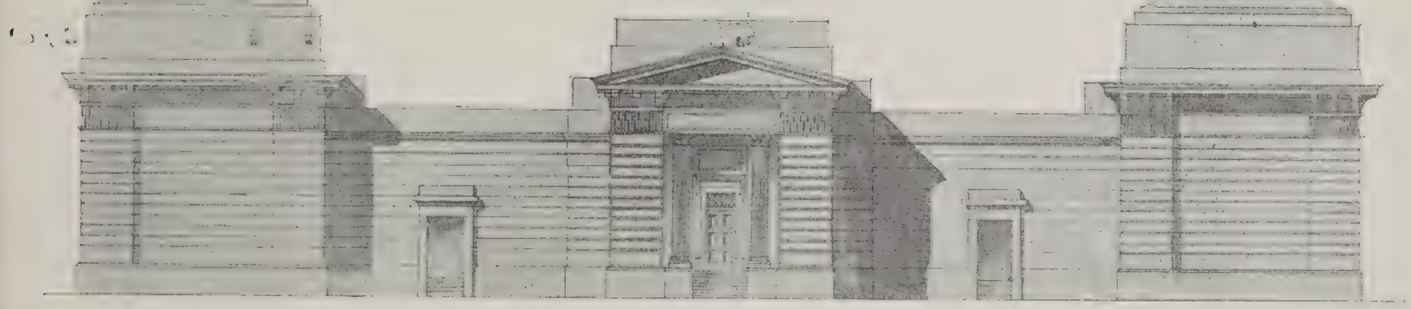


By Lionel B. Budden.

DESIGNS FOR A CAMPO SANTO BY STUDENTS OF THE ARCHITECTURAL SCHOOL, LIVERPOOL UNIVERSITY. *(See Centre Plate.)*



Sectional Elevation.



By H. A. Dod.

DESIGNS FOR A CAMPO SANTO BY STUDENTS OF THE ARCHITECTURAL SCHOOL, LIVERPOOL UNIVERSITY.
(*See Centre Plate.*)

Importance of Scale.

In architecture, therefore, the corresponding limitation is not in the subject, that is, the kind of building as might at first sight be supposed, or in the absolute size, but rather in the scale. We would all admit at once that we could not call a building small in scale and full of minute detail in the grand manner. The building to be so distinguished must rather be built in that large and spacious way we designate by the term "in a large scale." For the repose and dignity, the remoteness from fussy human occupations, which are essential to monumental building, this is indeed a first requisite. It is far more important than absolute size, though it insists on a minimum of that.

The question how "scale" in buildings can best be obtained is, I think, rather a complex one. It seems to be possible to achieve bigness of scale by so many different and opposite methods. It can be obtained by few and large parts, as in the Parthenon, or it can be lost at first sight by them, as in St. Peter's. It may be enhanced, on the one hand, by the foil of small parts seen against larger ones, as in the colonnades between the main piers in the new cathedral at Westminster, or it may be defeated as in the river front of the Savoy Hotel, by a mere multiplicity of detail.

If one may generalise at all on so subtle a part of our art, it is that the effect we aim at under the term "largeness of scale" is best described by saying that we try to give to our buildings an appearance that they are inhabited by not quite ordinary mortals, but by a more leisured race of slightly bigger bodies and more refined perceptions than we ourselves possess. For this illusion there must be simplicity and spaciousness in our vestibules and staircases; a dignified approach from one part of the building to another, as well as a corresponding simplification and enlargement of the main details.

Height of Columns.

Columns, for instance, by a long usage have received a certain limiting size bearing a certain ratio to the human body. The order at Greenwich is 36ft. high, and gives a sense of grandeur to the whole group of palaces. The order at St. Peter's is nearly 100ft. high, and it takes many visits before its size can be appreciated. Perhaps Michel Angelo peopled his building with the Colossi from the Medici tombs or the Titans from the Sistine roof. Such conceptions of architecture are beyond the ordinary mortal; they burst too suddenly on the world to be assimilated. If they had been, and Michel Angelo's scale had been copied rather than his eccentricities by succeeding architects, we might to-day have been able to think in orders of 100ft. or more, and the world would have been a finer place to live in. For it is quite clear that custom has a great deal to do with the matter. A very large order, or its equivalent, looks better in Paris, and better still in New York or Chicago, than it does in London, where the general scale of the town, in spite of its size, is less. The effect, then, of largeness of scale is to be obtained at any given time by such increase over the general scale as can be appreciated, and is in proportion to the environment. Cockerell's Bank of England in Castle Street, Liverpool, succeeds in being impressive in its scale, where a much bigger building opposite in a still larger scale degenerates in comparison into clumsiness.

The sense that a great building gives, that it belongs to a finer race of men, is sometimes given to much smaller buildings by the use of simple masses of one material, such as large blocks of stone. In nearly all primitive buildings, from Stonehenge to the Parthenon this method of impressing the beholder has been adopted. The feeling that giant labour must have been used for the work is perhaps at the bottom of it, though that is not a quite sufficient explanation. We see something of the same effect in the most homely cottage when it is built of big stones. North Wales, which is poor enough architecturally, has yet here and there these simple massive cottages, which in their immutability never fail to impress one with the sense that they are akin to the mountains and the larger works of nature which surround them. The impressiveness of Piranesi's prison dreams, apart from their power as pictorial compositions, is largely due to the massiveness of the masonry he has introduced. We feel how hopelessly lost are the pigmy human beings among such titanic structures.

Greek Love of Monolithic Effect.

The Greeks were particularly anxious to give this monolithic character to their temples; when building in marble they rubbed the beds to make the joints as thin as to be invisible, and when building in stone they covered the whole with a fine marble stucco to obtain the same appearance. The majesty and remoteness of the Parthenon, which is not a big building as modern buildings go, the sense that it is a building for the use of gods rather than men is entirely due to the largeness of its scale. The three steps on which it stands, out of all proportion to the human figure, help the illusion, while the smaller detail of the cornice and frieze acts as a foil to the simple mass of the roof and the gigantic sturdiness of the columns. It is a commonplace that no building in the world combines such delicacy and refinement with such a sense of restrained power.

Restraint and Refinement.

This brings us to the third constituent of the grand manner—restraint, with its attendant and complementary quality of refinement. By this I do not mean any emasculated elegance, but rather that repose of manner and delicacy of outline which is a sure sign of strength—the strength of the steam-hammer which can forge an armour plate or crack an egg. This is the refinement which would avoid any crude naturalism or over-emphasis in ornament; which would give it a conventional and abstract rather than a natural form, corresponding very closely to Sir Joshua's definition of drapery. Such refinement should prevent any sudden contrasts or efforts after piquancy so frequent in modern building. It should not, for instance, be satisfied with a large mass of rich ornament planted on a plain, unmodulated field. Instead of over-simplification and concentration of effects, we should find a suave, grave manner, infusing itself over the whole design. Columns should be fluted, suitable mouldings carved with their proper enrichments, and all those small indications of good taste, which we know so well how to look for in dress, should be apparent in our façades to those who can see them. These, then I take it, are the three chief attributes of the grand manner as we have learnt them from Reynolds—unity, scale, refinement. Let us now look into the matter historically and see where some or all of these qualities are to be found.

Egyptian Unity of Conception.

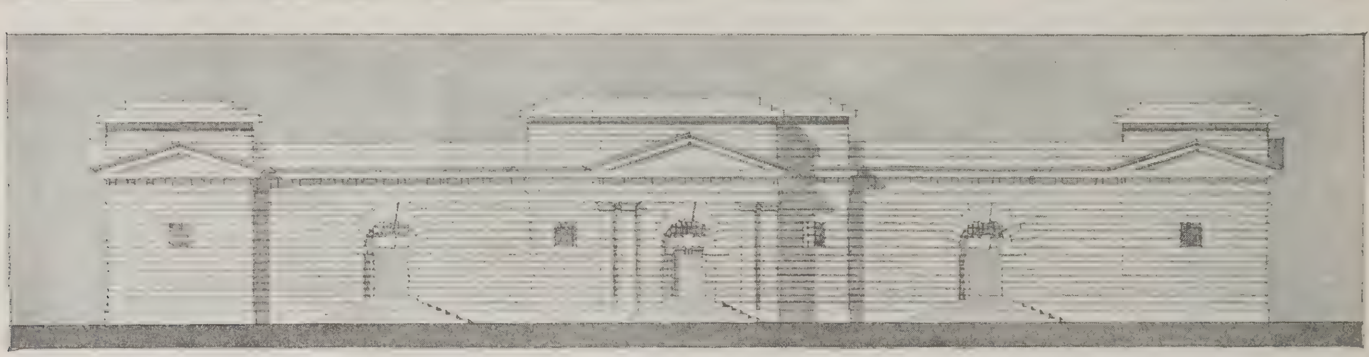
Without considering any architecture which is not in the direct line of our descent, and must therefore speak to us in an alien tongue, we may begin with Egypt, where we find our first characteristic—unity of conception—carried out with singular completeness in certain definite directions.

In the architecture of the ancient temples of the Middle Empire, the great period of Egyptian building, we find everything arranged to impress the beholder, as he advances along the central axis, with the sense of the impenetrable mystery and power of religion. The long approach through avenues of sphinxes, through one massive gateway after another, across court after court, each more confined than the last, until that forest of huge columns, the hypostyle hall, is reached, through which is dimly seen, still on the line of the central avenue, the shrine and sanctuary, lit only through the entrance door, and again beyond that the rooms of the mysterious attendants of the god. All these things add increasing intensity to the conception of mystery combined with secret power, which is the *motif* of these temples.

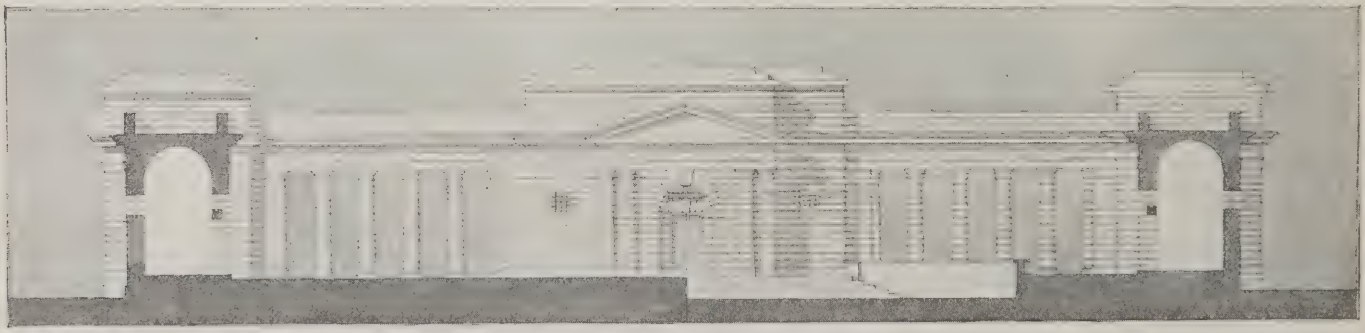
The sense of scale is there, too, to an extent which is almost overpowering, and if refinement of form is not at its highest pitch, at any rate the whole scheme of decoration obeys a very distinct law of its own. The building then is of the grand manner if approached along the right axis and with the right point of view. In any other direction it presents blank walls and, apparently, unrelated rooms.

Hellenistic Temples.

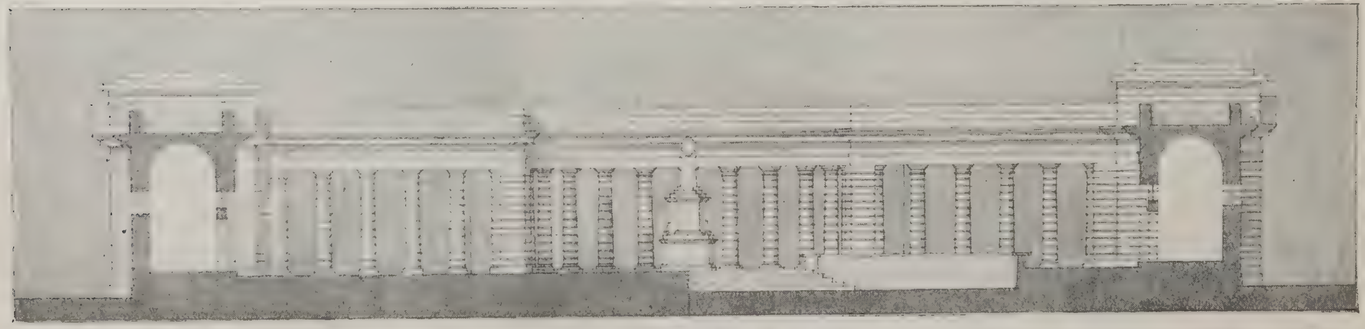
Passing on to Greek Hellenistic architecture, as seen in the temples—the only buildings we know much about—we find exactly the reverse is the case. The buildings are as complete, from every external point of view, as a porcelain vase or an isolated bronze figure. The unity of idea is almost bald in its simplicity—a hall surrounded by columns under a single roof, the whole executed with every care and solicitude to give the appearance of being sculptured out of a single mass of marble. I have dwelt already on the largeness of scale in which this is done, while the many and subtle refinements introduced to overcome optical illusions, which might detract from the completed, perfected whole, are commonplaces of the textbooks. The result, therefore, within its limited range, may be said to be as perfect and unified a conception as the human mind is ever likely to achieve. And yet we must admit, if we are sincere, that the Greek, in seeking perfection as he did, limited the scope of his art. His temple, seen from the outside, presupposes a single hall in the interior. As a matter of fact, it generally con-



WEST ELEVATION



SECTION LOOKING WEST

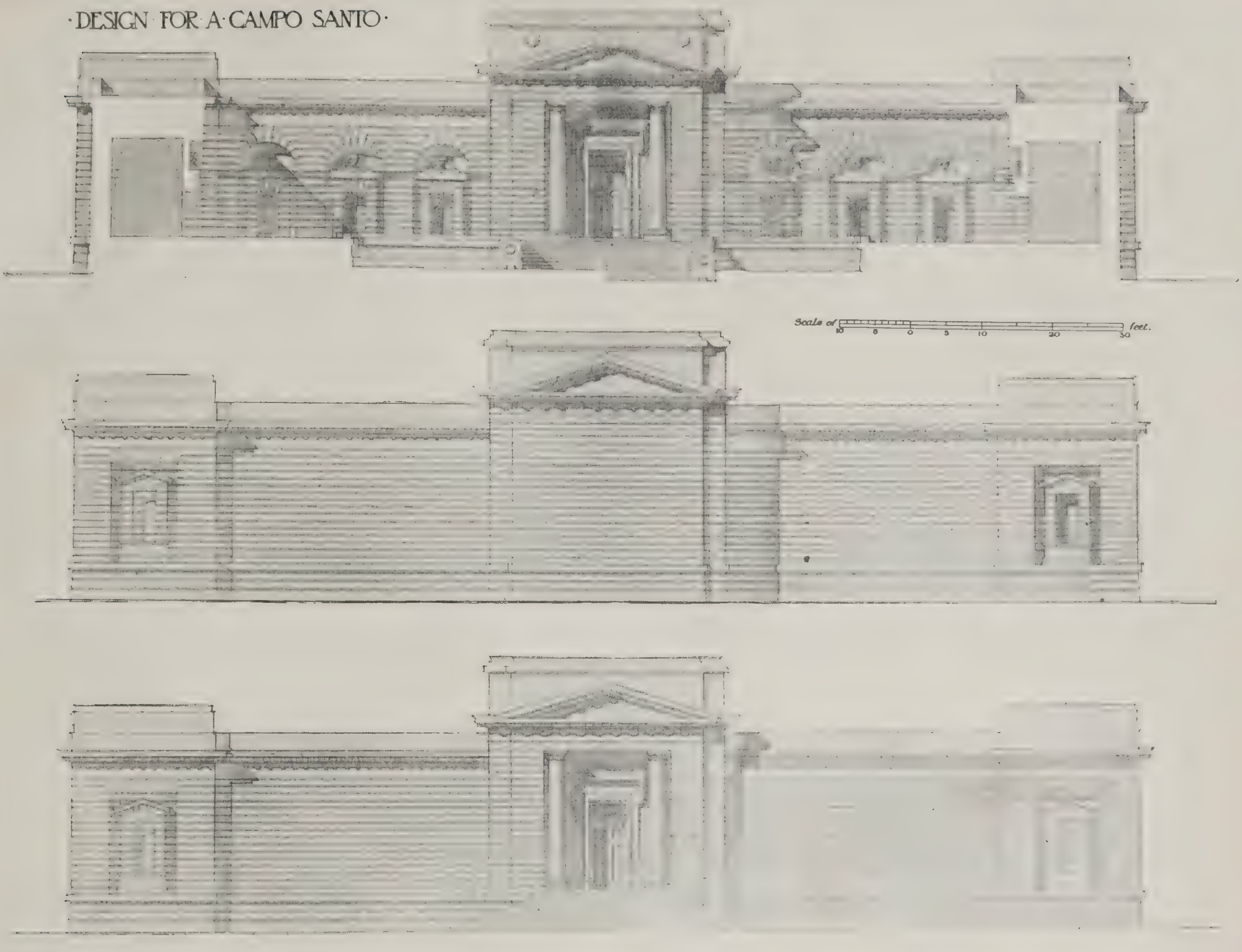


SECTION LOOKING EAST

By E. Campbell Lemon

DESIGNS FOR A CAMPO SANTO BY STUDENTS OF THE ARCHITECTURAL SCHOOL, LIVERPOOL UNIVERSITY.

(See Centre Plate)



By E. Prestwich.

DESIGNS FOR A CAMPO SANTO BY STUDENTS OF THE ARCHITECTURAL SCHOOL, LIVERPOOL UNIVERSITY.
(See Centre Plate.)

sisted of two or more apartments, no suggestion of which is given by the exterior. The point of view of the designer seems to have been that of a sculptor modelling a single figure for an isolated pedestalled position. Accepting this, everything was done to impress the beholders, to give that single blow upon the mind which a work in the great style should always produce. The most delicate refinements, the severest repression of any detail which might compete with the unity of the whole, were always employed. So far as it went then, and for the exterior only, Greek temple architecture was of the very essence of the grand manner; but what we must admit, if we are not carried away with the narrow enthusiasm of the archæologists, is that the problem attempted was extremely simple. To achieve anything like the same results, to give the same sense of unity, scale and refinement to a complex modern building, is an infinitely more difficult problem, and one that gives far greater scope to the genius of the individual. For, as with the churches of the Middle Ages, so with the Greek temples, with a few exceptions, there always existed a traditional shape for the general mass, as well as a traditional way of articulating the detail. Each temple, as each church, was a refinement or otherwise on its predecessor. No choice of method, no planning, no composition of major or minor masses in any modern sense was open to the designer, whereas the architect to-day must bring his art to bear upon, and translate into monuments worthy of his country, a vast variety of human institutions.

The All-conquering Romans.

Leaving, then, the Greeks, who no doubt consciously renounced variety in their building, just as they refused to individualise their sculpture, in order to obtain perfection within certain definite types, we pass to the Romans of the Empire, to whom all things were possible if all things did not turn out to be expedient. To the conquerors of the world, architecture knew no self-imposed limits; and if we cannot always admire their taste and choice in the materials and detail in their buildings, we, who live in an engineering age, must pay homage to those who attacked all problems with equal daring, if not with equal success. There was nothing dilettante in the spirit of the Roman, who reared, higher than many a mediæval cathedral, the solid vaults of the Baths or sprang the Pont du Gard from hill to hill. A sense of unity which would remove one of the seven hills of Rome itself in order to lay out the vast hemicycles of the forum of Trajan without loss of symmetry, which converted a square mile of Rome into colonnades and porticoes of surpassing magnificence, which evolved the orderly procession of stately shapes in the plan of the Baths of Caracalla, or conceived the mighty sweep of the Colosseum Wall, this was a sense of unity—the first element of the grand manner—exhibited in a way the world had not yet seen. If we examine in detail the plan of the central block of one of the vast clubs or universities which we know by the name of baths, such as that of Titus or Caracalla, we find every element of the plan arranged to give on either axis the utmost grandeur of internal vista and effect. Here is a complex modern plan, such as the Greeks never attempted, of which each part is well shaped, well combined, and well contrasted with every other; and focussing the whole is a hall of surpassing proportions and magnificence. In

The Baths of Caracalla,

the main vista is 250 yards long, and the central block itself is greater than the Houses of Parliament, the Law Courts, or the British Museum. But the main point for us is that here is an organised series of halls of varying heights and sizes combined into one homogeneous structure—the problem of modern building. The second element of the grand manner, a large scale, is equally apparent. It was chiefly obtained by means of colonnades of smaller columns contrasting with the main piers, and enhancing the vista in every direction. That these buildings, as far as we know, lacked the third element, refinement and restraint in detail, may at once be admitted. What, however, is more important from our particular point of view is, as far as we can gather from the plans and the remains that are left to us, that the exteriors of these complex buildings were in no sense worthy of the interiors. The outside of the Pantheon, whether clothed in marble or not, makes this abundantly clear. The buildings seem either to have been screened by some kind of colonnade, or left as blank walls. The sense of architectural composition which the interiors show does not seem to have been applied equally to the exterior, so that that complete sense of unity of which we are in search, which failed us with the interiors of the typical Greek building, now fails us with the exteriors of these typical Roman buildings. Except the Colosseum, which is really a single chamber, I do not know that we could say of any Roman building that it had a completely harmonious and satisfactory internal and external composition.

This, then, was the problem which was left unsolved at the collapse of the Augustan period. In the East, in Byzantium, where the Greek mind reacted on the Roman methods, a solution was arrived at, and more or less complete harmony between exterior and interior work was brought about. I do not feel, however, in spite of modern revivals and archæological interest, that that solution directly concerns us. It is, as I have already said of other architecture, outside our direct line of descent.

The Kernel of the Renaissance.

The solution which does concern us, with which the majority of us are engaged each day, is the one the Renaissance architect gradually achieved. The conscious attempt to solve the problem of complete unity was no doubt due to the intervening period of Gothic architecture in the North of Europe. It was there for the first time that a building equally expressive and harmonious from within and from without was evolved. It does not matter for the purpose in hand that this was done unconsciously by letting the construction speak for itself and determine the forms used, for Gothic architecture had thereby set a standard of truth which it was impossible for the Renaissance architects, even in Italy, to ignore. The result was that while striving to produce buildings which in their ignorance they considered to be in "the antique manner," they were really doing work as different from Roman work as that was from Greek.

The Great New Fact

which emerged with the Renaissance was the recognition of the personality of the artist. In every art the same thing occurred: the personal attitude to art was part of the intellectual upheaval of the times. The weakening of tradition brought about by the rival forms in vogue gave opportunity to individual expression. The result was that Renaissance architecture, and all the Renaissance arts, became in a sense self-conscious, and the forms of expression used were the objects of deliberate choice. We may, therefore, say that the Renaissance solution to the problem of unity consisted in applying the personality of the artist to the work in hand: the architect for the first time moulds his building and composes his masses, the sculptor chooses his subject and arranges his groups, the painter designs his composition—each on the free lines of his individual choice.

A Bold Departure from Tradition.

The Pazzi Chapel, it has been well said, presents as bold a departure from tradition as Columbus's voyage into the unknown. Such vigour in the nature of things could not last indefinitely, but for a couple of centuries architecture in Italy was saved by the powerful personalities of its practitioners from anything like the mere reproduction of the works of antiquity, or of any deliberate intention thereto. It was not till the affectation which followed the discovery of the writings of Vitruvius that anything so disastrous to art came about. It was then time for other countries, for France and England, to take up the running.

Strength and Delicacy.

But before this had happened, Peruzzi had built his Albergati and Massimi Palaces, combining delicacy almost Greek in its refinement with strength and austerity unknown to the Romans, while San Michele, at Verona, in his gateways through the city walls and in his Palazzo Gran Guardia, Vecchia, as well as in the lower storey of the Grimani, had shown how to use the orders as their master rather than their slave. None of the great Italians compare with him in the breadth and bigness of his work, in suppression of all subordinate features, to obtain one great effect; that is to say, none compare to him in the grand manner. The only possible exception is Michel Angelo himself, and that only because of the enormous scale he habitually used. If we may take the Palazzo Conservatori as his own in any sense, this is the one element in this group of buildings I would claim for him—the element which, in spite of its debased detail, gives it its undeniable effect of grandeur.

The Classic Eighteenth Century.

Leaving early and tentative work in France and England, and coming to our own fully-developed Classic architecture of the 18th century, it is easy to find examples, which if they lack in conception the highest flights of imagination and daring, exhibit not only unity of idea, but the elegance and repose we instinctively associate with the men and manners of the 18th Century. The Customs House, Dublin, by Gandon, is a good example. It is not only big in scale, but powerful in composition. It has the same sort of simplification of detail that San Michele used, witness the reduction of the main frieze and architrave into one powerful member. Somerset House, particularly in the river front, has something of the same feeling; the masonry of the basement storey being almost Piranesi-like in its strength.

Quiet Grandeur.

That it was possible to give the same air of quiet grandeur to a small building is shown by Hawksmoor's Clarendon Press, at Oxford. This building is quite a small two-storey structure, but with great skill the architect has given it a portico with columns 3 ft. 10 in. in diameter and 40 ft. high, without either dwarfing the building or making it appear a mere adjunct to the entrance. He has instead, by a careful suppression of competing detail, welded the whole into one sculpturesque mass, in which the great scale of the columns is admirably maintained.

While largeness of scale may be said to have been the chief characteristic of our late 18th Century architecture, it was accompanied, when in the hands even of provincial practitioners, with a refinement of detail which we have long since lost. Let me instance the older rooms at the top of the main staircase in the Town Hall at Liverpool. I know no more elegant apartments either in shape or in refinement and delicacy of enrichment. Yet these were the work of two architects, father and son, who practised in Bath—the Woods—showing that at that time, when there was behind the architect a convinced body of opinion, it was possible to obtain scholarly work far beyond the metropolis. Indeed, Manchester and Liverpool are full of such work. It does not matter how small or poor the house may be, there is always

A Sense of Scale

in the simple plainness of the exterior, and a sense of refinement in the finish of fan-light, doorway, fireplace or reeded cornice. The same spirit spread to the furniture-makers, the china-makers, the plate-makers. Do we not all collect late 18th Century bric-à-brac when we can, and are we not happy with our Heppelwhite and Sheraton chairs, whether they have any claim to those august names or not? We see the same spirit in the arrangement of the rooms. Nothing is haphazard, unbalanced, or meaningless. Consider that example of Robert Adam's planning, a house in Grosvenor Square, for Lord Derby. It is for the ordinary awkward slip of a site in a town, and yet what an elegant suite of rooms we can see these forms will make. Notice the splendid vista on the first floor, and the general sense of ease and unity which pervades the plan.

Reactionary Revivals.

But this consensus of opinion, which made it possible for every detail of a building and its furniture to be harmonious, refined and elegant, has long given way before the series of revivals from which we are still suffering. But while we in England have been following the will or the wish of one architectural fashion after another, with no real faith or knowledge to guide us, France and, more lately, America has been content to develop the old large-scaled 18th and early 19th Century architecture from where we left it, and to add to it new detail and new interest, until

The Ritz Hotel,

in Piccadilly, suddenly appears as a veritable portent among us to show how far we have been left behind. The Ritz is typical French work; shall we say that the Midland Hotel, Manchester, is typical English! Is it not time we began more seriously to study the work of our great neighbours? Painters and sculptors have long ago found this out to their advantage. In every Prix de Rome drawing there is an amplitude of planning, a spaciousness of effects entirely absent from English work.

The Americans, too, in their banks and public offices and some of their larger residences have attained a consistency and dignity of idea, as well as a breadth of treatment which vies with the best modern French work, and often surpasses it in what we might in the eighteenth century have called an English characteristic—soberness. The success of both these countries (France and America), I am convinced, lies in the sound initial training that the best architects get in what we call classic or academic work. They learn in their schools to draw carefully and to shade carefully their orders, and then to apply them in simple composition. I am quite sure that the painstaking, shaded drawings alone have a great deal to do with refinement and delicacy of detail. How could Cockerell have rendered the beauty of his mouldings with a line on the drawing as thick as the fillets are in real life?

I am convinced that the day of the coarse swag and the heavily-blocked column is over. Students with the keen eye that the best always have for what is in the air, are already beginning to turn their attention to the greater delicacies of the early Greek work in England, and to measure the buildings of such men as Smirke, Soane, Elmes and Cockerell. This brings us one step nearer, I hope, to a

Great Cosmopolitan Art of Architecture

in which we shall compete as equals, not with each other only, but with the world at large. When that time comes I think we shall find that that combination of unity, scale and refinement I have ventured to term the grand manner will be the first essential to success.

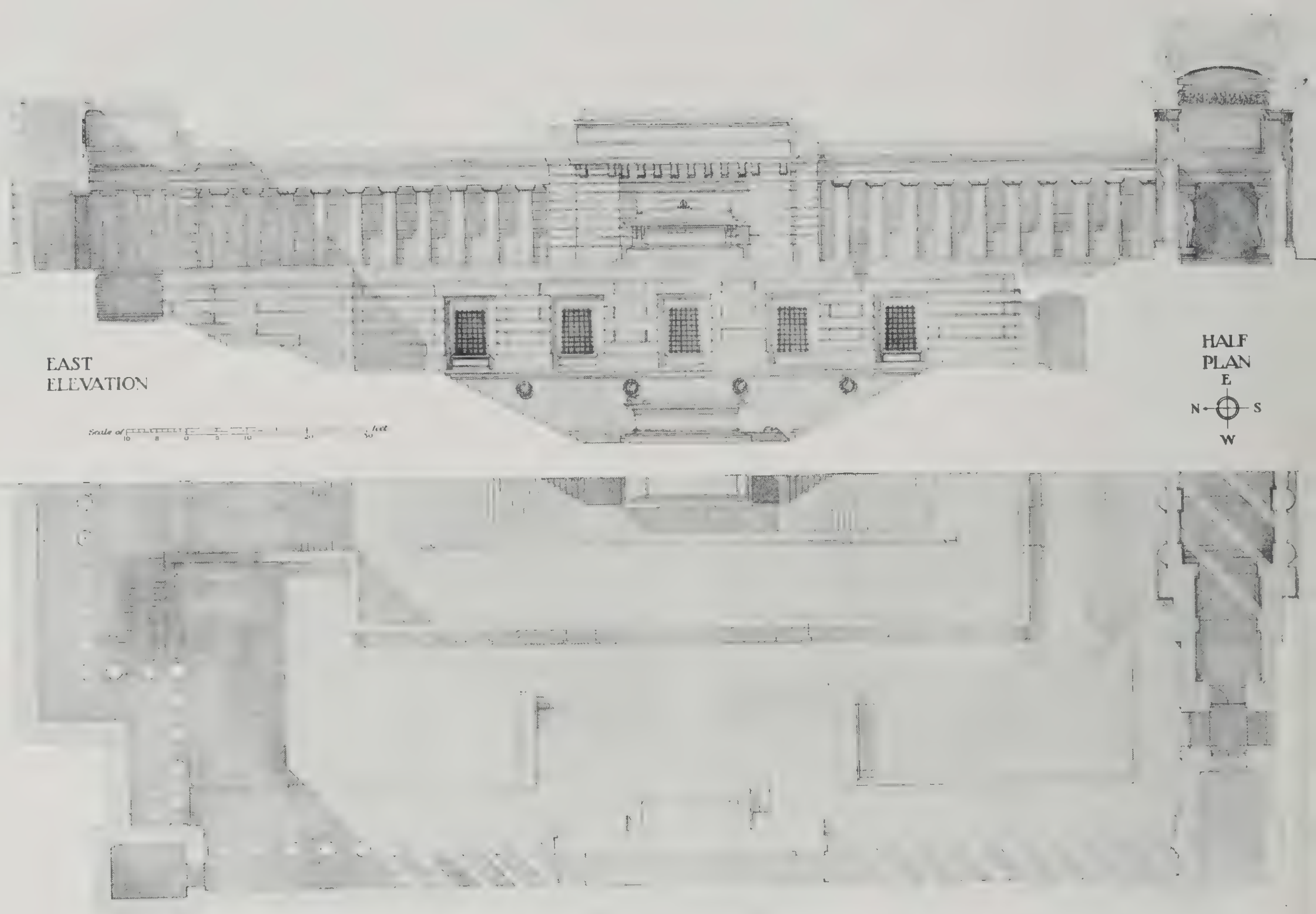
Mr. George Frederick Bowman has been appointed architect for the Leeds workhouse extensions.

* * *

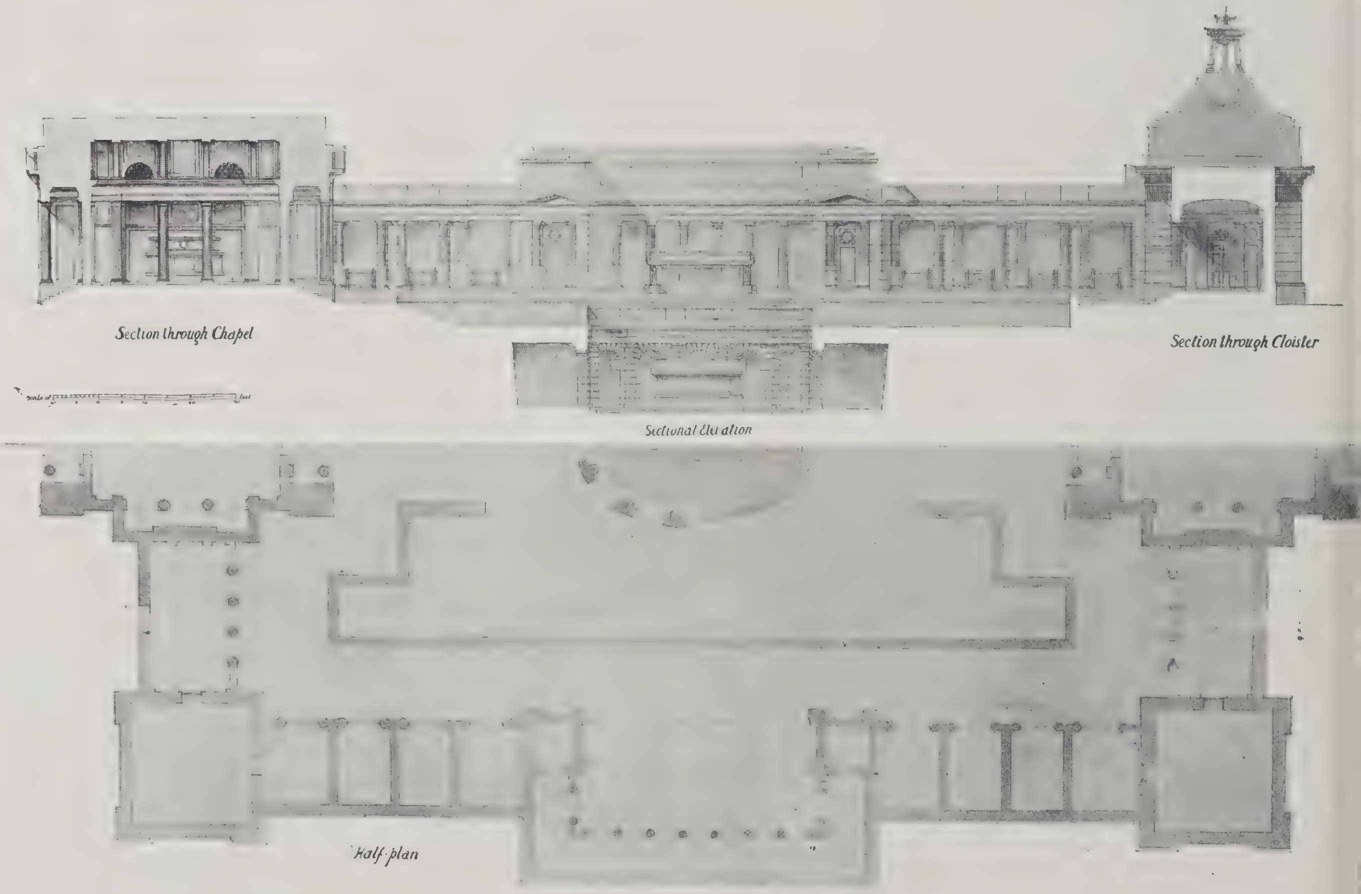
Our contemporary "The Cambrian" takes as an example to manufacturing firms and builders, the arrangements of Messrs. Johnson Brothers, dyers and dry cleaners, of Bootle. The firm has recently acquired four acres of land for possible extensions to their works, and have, for the present, laid it out as a recreation ground for their employees. Shrubs and trees have been planted, a bowling green laid down, also tennis courts, croquet lawns, and pitches for quoits. Cricket, football, and hockey grounds are also being prepared. Two pavilions have also been built for use as club rooms, for the use of the male and female employees, fitted up for winter games, as billiards, etc., with provision for cooking meals and supplying light refreshments. This is certainly a public-spirited policy, upon which we make our compliments to the firm in question.

* * *

In the notes on "Our Plate" of March 10th the name of Francis Reade of Co., electrical engineers, 2, The Broadway, Church End, Finchley, was given as Francis Vere and Co. The name was given as received by us, and the mistake is probably easily explained by the fact that Mr. C. M. Vere is manager of the firm.



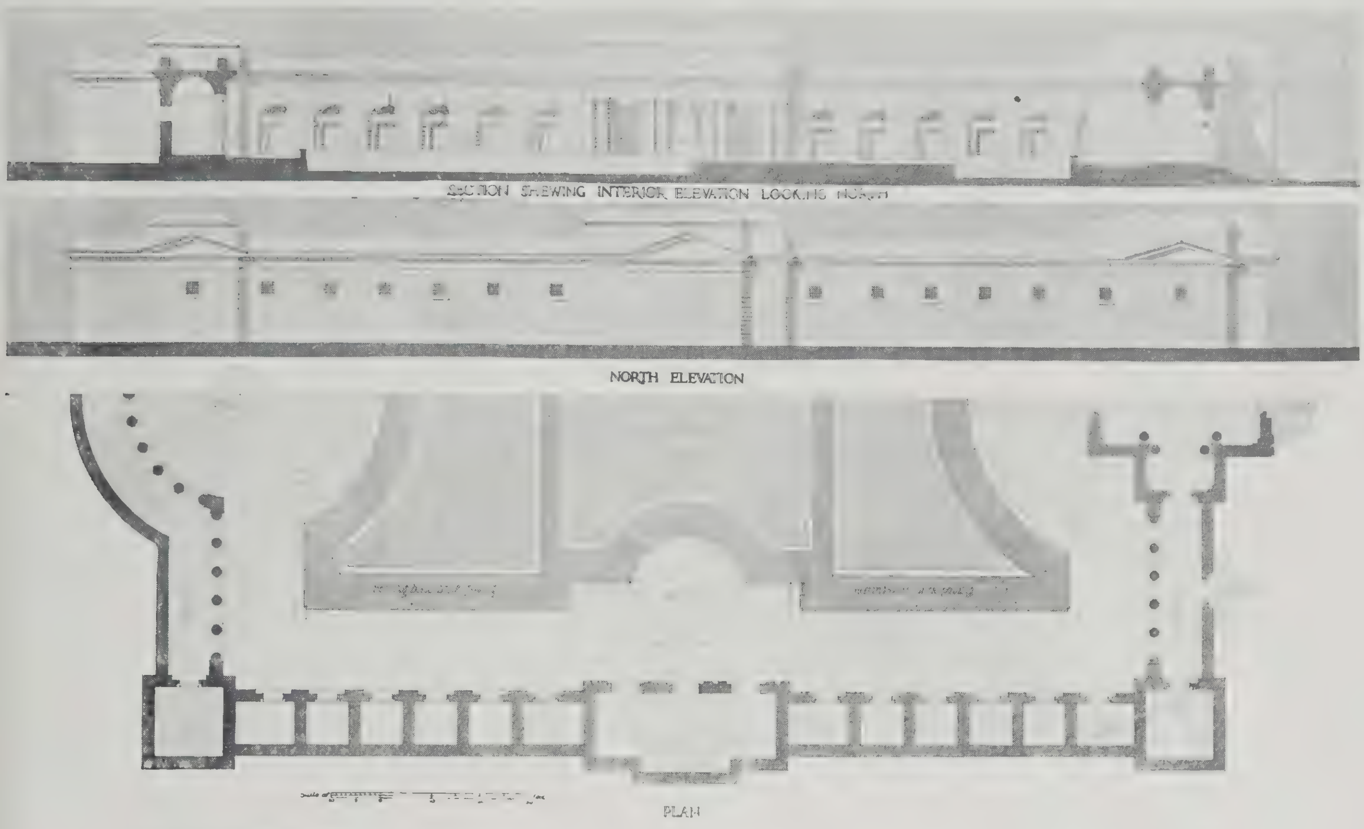
By Lionel B. Budden.



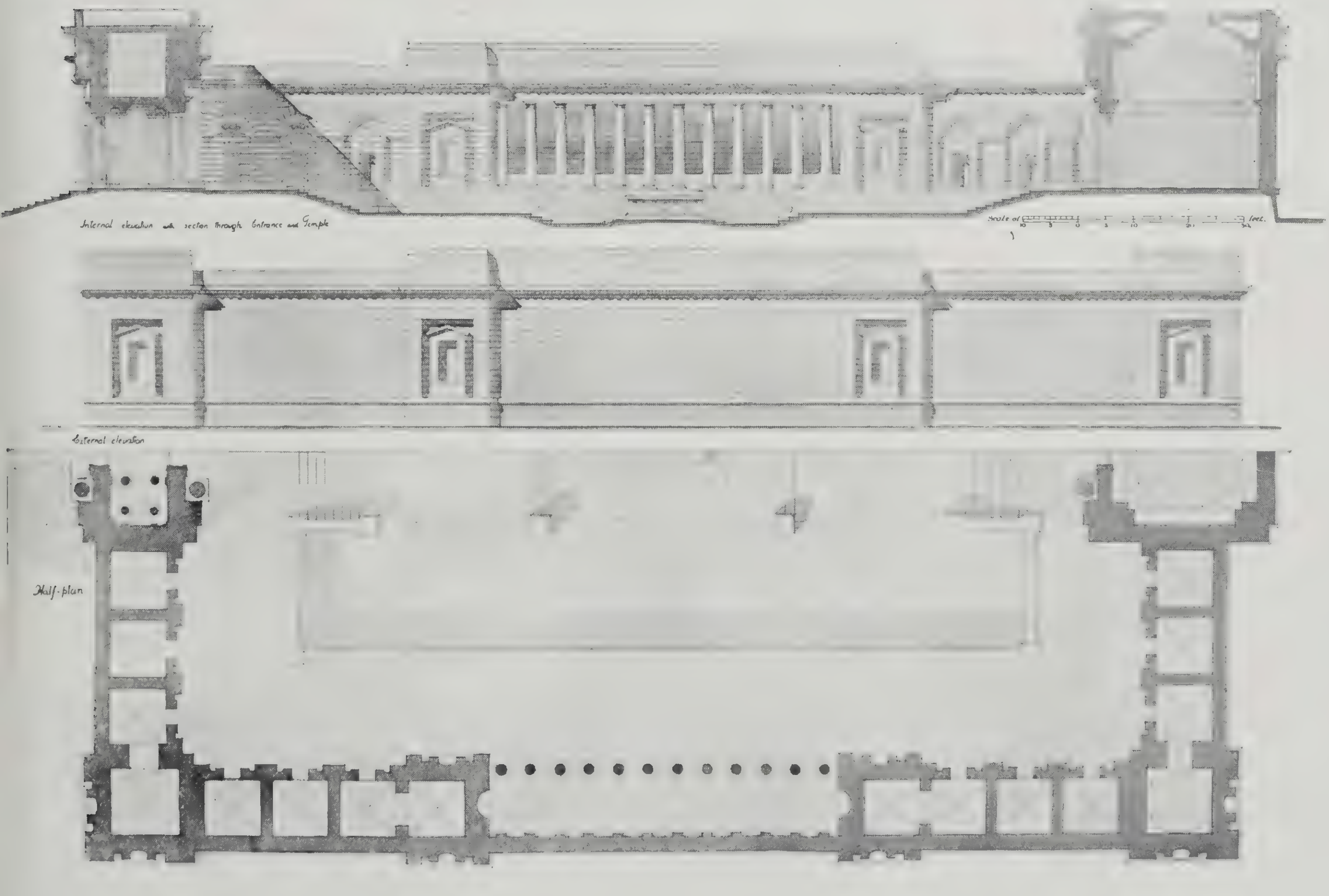
By H. A. Dod.

DESIGNS FOR A CAMPO SANTO TO CONTAIN

BY STUDENTS OF THE ARCHIT



By E. Campbell Lemon.



By E. Prestwich.

MENTS TO VITRUVIUS, SANMICHELE AND PERUZZI.
. SCHOOL, LIVERPOOL UNIVERSITY.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
Mar. 31	MIDDLESBROUGH. New Library in Dunning Road and Grange Road, East Middlesbrough. Premiums, £50, £30 and £20. Particulars and conditions on application to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough. Deposit £2 2s., which will be refunded if the conditions are returned within ten days
April 10.	BOLTON BRANCH PUBLIC LIBRARIES. The Libraries Committee of the Corporation invite competitive plans from architects who have been principals in the County Borough of Bolton six months prior to the present date for Branch Public Libraries to be erected in the districts of Astley Bridge, Halliwell, and Gt. Lever. The plans and particulars may be obtained from Samuel Parker, Town Clerk, Town Hall, Bolton. Deposit, two guineas.
April 12.	ELLAND NEW SECONDARY SCHOOL. Architects having offices and practising in the West Riding of Yorkshire are invited to compete for the work in connection with the new Secondary School at Elland, and should apply for particulars to Mr. Leonard Clegg, Holiwell Green, near Halifax.
July 31.	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	BOURNEMOUTH BRANCH PUBLIC LIBRARY. Architects practising in the County Borough of Bournemouth are invited to submit designs for a new Branch Library at Boscombe. Particulars from Charles Riddle, Borough Librarian, Central Library, Bournemouth.
No date.	WALLASEY U. D. COUNCIL CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

Pretoria (S.A.) Post Office.

The assessors, Messrs. A. Baker, W. F. Stucke, and W. Reid, all of Johannesburg, have made their award in the above competition. Mr. A. J. Stewart, of Messrs. Howard and Stewart, Johannesburg, is awarded the first place; the second goes to Messrs. Kraan and Wyers, of Pretoria, and the third to Mr. J. E. McKenzie, of Boksburg.

Our Plate.

The drawings on our centre plate and on the early pages of this issue represent four designs for a Campo Santo, to contain monuments to Vitruvius, Sanmichele, and Peruzzi. They are the work of students at the School of Architecture, Liverpool University (under Professor C. H. Reilly), whose ages average from 18 to 20 years; they have had two years' study in the day school, coming straight from public schools, and having had no previous special instruction in drawing, except Mr. Lemon, who had had some previous training in an office. The subject was set as an ordinary design subject of the academic type, which, at the Liverpool School, is alternated with designs of a more constructional character. Since completing these drawings, the same students have designed an inn for a country town, and are now at work on an art gallery. The constructional designs are worked out in detail, the academic type being left in the stage here shown. All designs are worked out in the school, and the subjects increase in complexity and difficulty during the progress of the course.

TESTS OF ROLLING SHUTTER DOORS.

Messrs. Arthur L. Gibson and Co. draw our attention to an inaccuracy in the report on page 243 of our last issue under the above heading, in stating that this double door test (No. 135) *may be deemed a record*, in respect that the doors not only withstood the four hours' test, followed by the application of water, but that one of the doors could be worked after the test. Messrs. Gibson refer us to test No. 111, where, it is pointed out, the test was much more severe, seeing that the gas producing plant broke down after three hours and ten minutes. Water was immediately applied at a pressure of 60lbs. The test was renewed three days later, and water again applied at its conclusion. In spite of this double test, both shutters were workable at the conclusion of the test, as is evidenced by the report and the photographs accompanying it. The fire at no time passed round the shutters. So little did the shutters in test No. 111 suffer that they were on exhibition during the whole of the Builders' Exhibition at Olympia in 1907, and thereafter one of them was sold, erected on a building, and has been in regular use ever since.

Proposed New Buildings.

ACCRINGTON.—The Town Council has decided to build new baths, including swimming and slipper baths, at a cost of £10,450. The L.G. Board has sanctioned the scheme.

BIRMINGHAM.—The L.G. Board has held an inquiry into the application of the City Council to borrow £11,170 for the provision of a new fire station at the corner of Albion Street and Legge Lane.

BRAMHALL.—A new church is to be erected here at a total cost of £7,500. The scheme will be divided into two parts, the first to cost about £4,000.

CARDIFF.—The watch committee are considering the provision of a new fire station. Plans are to be prepared for alternative sites at (1) on the present site and land adjoining in Westgate Street, (2) in Womanby Street, and (3) in the Fish Market.

CORK.—The Corporation are proposing to raise the sum of £16,000, to erect a new technical institute in Fitton Street.

DUMFRIES.—The Town Council are considering the erection of a new town hall and municipal offices. The probable cost is stated at £17,500.

GLASGOW.—The City Engineer has been instructed to prepare working drawings and specification, quantities, etc., for an extension of the public slaughterhouses. The cost is estimated at £65,000.

HUDDERSFIELD.—The Town Council are applying to the L.G.B. for a loan of £12,000 to erect a new elementary school for 600 children at Birkby.

KENDAL.—The Westmorland County Council is proposing to erect new technical schools here at a cost of £10,000.

KIRKBURTON.—A new Council school is to be erected here to accommodate 250 children.

MIDDLETON ST. GEORGE.—The Darlington Sub-education Committee of the Durham County Council are proposing to build a new school here to accommodate 200 children.

PAISLEY.—An extension of the Renfrew County Buildings is contemplated to provide extra accommodation for the Police and Public Health Departments. A sub-committee appointed to consider the question has delivered a report to the Council.

WEST HARTLEPOOL.—A new theatre is to be erected at the corner of Lynn and Freeman Streets. The plans presented by Mr. R. Thornton have been passed by the Town Council.

FEDERATED EMPLOYERS.

The Federated Employers' Insurance Association, Ltd., notify that on and after March 29th instant, the address of the Association will be 8, King Street, Manchester, more extensive premises having become necessary.

INSTITUTE MEMBERS' CLUB.

A meeting of the above will be held in the smoking-room of the R.I.B.A., 9, Conduit Street, to-morrow, Thursday, March 25, 1909, at 6 p.m.

Coming Events.

Wednesday, March 24.

Northern Architectural Association (Newcastle).—Annual Meeting, Exhibition of Students' Work, and Presentation of Prizes, 7.30 p.m.

Edinburgh Architectural Association (117, George Street).—The meeting arranged for this date has been postponed.

Glasgow Institute of Architects (187, Pitt Street).—Symposium on Competitions.

Saturday, March 27.

Northern Polytechnic Architectural and Building Students' Association.—Visit to Messrs. Kirkaldy and Sons' Testing Works, 99, Southwark Street, S.E., 2.30 p.m.

Monday, March 29.

Royal Institute of British Architects.—Sir Aston Webb, R.A., F.R.I.B.A., on "Buildings for Higher Technical Education," 8 p.m.

University of London (South Kensington).—Mr. Banister Fletcher, F.R.I.B.A., on "Georgian Architecture," 8 p.m.

Tuesday, March 30.

Bristol Master Builders' Association.—Annual Dinner, Royal Hotel, Bristol.

Builders' Clerks' Benevolent Institution.—Annual Dinner, Holborn Restaurant.

Wednesday, March 31.

Edinburgh Architectural Association (117, George Street).—Mr. James Ballantine on "Stained Glass," 8 p.m.

Thursday, April 1.

Leicester and Leicestershire Society of Architects.—Mr. W. K. Bedingfield on "The Architectural Possibilities of Reinforced Concrete."

Monday, April 5.

Society of Engineers (17, Victoria Street, Westminster).—Ordinary Meeting, 7.30 p.m.

Liverpool Architectural Society (13, Harrington Street).—Annual General Meeting.

Wednesday, April 7.

Northern Polytechnic Architectural and Building Students' Association.—Lecture on "The Hennebique System of Reinforced Concrete," 8 p.m.

Edinburgh Architectural Association (117, George Street).—Associates' Business Meeting, 8 p.m.

At the annual general meeting of the Society of British Sculptors, Mr. Thomas Brock, R.A., in accordance with his intention announced some time since, retired from the presidential chair, and Sir Charles Lawes-Wittewronge was elected president. Mr. Brock was elected treasurer and Mr. E. G. Gillick, Mr. Basil Gotto, Mr. Havard Thomas, and Mr. A. G. Walker were elected to serve on the council.

GEORGE DEVEY AND HIS WORK.*

A Grateful Client.

George Devey was born in Dorset Place, Kentish Town, London, in the year 1820. His father was a solicitor practising in Ely Place, Holborn, where for some years he lived with his family. It was through some extraordinary services, rendered to a needy client, that in the end secured for our friend an introduction to a distinguished man, resulting in the foundation of the young architect's practice. A gentleman, the reverse of rich, had been recommended to consult Mr. Frederick Devey, the solicitor (and father of our friend), with reference to the recovery of some property which had almost been given up as lost—partly on account of the lapse of time and the difficult tangle into which things had got, and partly because the client was poor. However, after endless investigation, with little chance of payment, the faithful solicitor succeeded in recovering a large estate, which put the needy client into very comfortable circumstances. The client's gratitude was great, and he took every opportunity of recommending and introducing George Devey, wherever there was any chance for the young architect. As a result, Lord Hardinge became one of his first clients. This was the commencement of his professional work, and it was with natural pride that Mr. Devey would narrate the interesting and romantic story redounding so much to the honour and credit of his father.

In course of time the

Conscientiousness and Painstaking Work

of the young architect over little things, together with his natural ability, refinement, and attention to all the wishes of his client, so impressed the noble lord, that he soon gave him more important commissions, and went out of his way to find work for him. And he took a pride in showing his friends the drawings and sketches, which he had asked the young architect to send him for that purpose. This circumstance, as well as the natural conviction, which Mr. Devey always held, led him to impress upon young men the importance of doing justice to and taking pains over, the smallest commissions.

Painter or Architect?

From Kentish Town, when the children grew up, the family removed to Ely Place, Holborn, in order that the boys might go to King's College School. He was well grounded in Latin and French, and the latter he could speak with fluency. After he left school we hear of serious discussions as to whether he should follow the artist's or the architect's profession. He preferred the former, and from childhood had shown distinct ability in that direction. There is an impression that for a time he worked under J. S. Cotman and J. D. Harding, for whom he had a great regard, being influenced chiefly by Cotman. The earliest sketches about this period show great care in details, though they are somewhat formal according to the manner of that time. But his father and all his friends were against George's being an artist, for in the early part of the last century the calling was hardly thought of as respectable enough to be classed with the professions. Eventually it was decided to article him to a Mr. Little, an architect and surveyor—at that time there were few men practising only as architects. Mr. Little appears to have had a small practice of a classic character, and the young man must have had rather a dull time. We hear of surveyors' dilapidations, and of the monotonous calculations involved in quantities.

A Gothic Church.

The most important thing he did in conjunction with his master were the designs for a new church—St. Mark's, Primrose Hill. Of these there were a number of drawings showing marked ability, especially when we think to what a low level architecture had sunk at that time, and it is the more remarkable when we remember that this work of his was almost before the Gothic revival had made any headway. In such an office and in such an age, how he acquired the true character, feeling, and details of Gothic work is difficult to say, except by the unerring intuition of the artist; and the revival then just starting, in which he must have been one of the first to participate.

After leaving Mr. Little he went on a Continental tour with his friend and fellow pupil, Mr. Coutts Stone, going through France and Italy to Athens. In those days, when railways were few, it was a considerable undertaking, but it naturally allowed more time and convenience for observation and sketching. This our friends enjoyed to the full. There are not many drawings left of this tour, but what remain are exceptionally good, especially those made in Venice and Athens. They show, as do all his sketches, in choice of subject, in composition and in refinement of execution, all the best characteristics of the true artist.

It was

In the Penshurst Country,

where his first business engagements commenced, about 1850, and he continued going to and fro to the year of his death, as friend and architect. Lord De L'Isle was one of his first clients, and remained all through to his decease. The restoration and repairs at Penshurst Castle were begun about 1850; the place had been very much neglected, and the work was many years in hand, together with lodges and new cottages about the estate. The greater part of the work was done by an interesting and independent old character, an excellent type of the yeoman-farmer and builder combined, who used to talk to his lordship and Mr. Devey just as he talked to his men. He was well versed in the old methods, and did good work. Here, too, were a house and various buildings done for James Nasmyth, of steam-hammer fame, who was a personal friend and always proud to show his visitors the boots he had kept when, as a workman, he tramped the country. Not far off is Hall Place, a large mansion and stables, built for Mr. Samuel Morley. Perhaps the most numerous examples of Mr. Devey's work are in this county and the Aylesbury district, where a great variety of work was done on the Rothschilds' estates.

He had

A Keen Sense of Humour,

and the sparkling sallies of wit, cheery banter and quiet sarcasm often turned business into pleasure. He had a commanding and distinguished presence, with a generous and kindly manner, shown to workman and client alike, as befitted the gentleman he was. In going over buildings, when things had gone wrong through carelessness, he would try gentle, and sometimes severe, sarcasm, as the case required, but when deception was met with, although he never lost his temper, his indignation made itself felt, with all the more force. To a foreman making the lame excuse for indifferent work, that it could never be seen, he said, "What, not seen? I should be ashamed for the birds to see it." He never would hurry over inspections and instructions to foremen, and there were times when clerks of works and foremen wished that he had not been so devoted to his work. He always liked to call himself a working man, and often regretted that there was no badge for us to wear in common with all workmen, showing the sympathy he had with all honest work. He hated the dress coat and Sabbatarian black, and liked home-spuns and quiet coloured shirts, not white linen.. He was

Full of Resource,

ingenuity and invention. An old foreman, who for years followed him about on works, used to say with pride that you could never get him into a corner, he always fought his way out, and many were the difficult problems that he would save for solution.

It is interesting to note, now that

Garden Craft

has become such an important adjunct to the complete design for a country house, that Mr. Devey was certainly one of the first in our time to take any practical part in its development. The immediate approaches and surroundings, the entrance courtyard, the enclosing walls and archways, the terraces, the disposition of steps, and the arrangement of gardens, connected with every well-appointed house, he always held came properly within the province and should be the work of every competent architect. And he attached great importance to the comprehensive treatment of all this, as a vital and necessary part of the whole design. An excellent example may be found in Coombe Warren, where the best characteristics are all brought in.

Hated the Contract System.

The commissions chiefly consisted in country houses, although there were a number of new schools and churches, repaired or restored. At the busiest time there were about ten men in the office, one modeller in constant work, and six clerks of works. For some years George Myers, the builder, carried out the largest works, and in this there was the great advantage of dealing with one set of men, who knew your ways. (He was the same Myers who in former years had done so much of the great Pugin's work.) But, satisfactory as this was, Mr. Devey hated the contract system, with all the endless bickering and compromises, so often involved, and with the difficulty there always was in carrying out a new idea or a second thought. So having had experience of how successfully some things had been done by estate works (I think it was at Lord Vernon's, Sudbury Hall), arrangements were made and a system adopted whereby the client built on his own account. This worked well for years, and was carried out concurrently with contract works, in other cases and in the usual way, where the client wished it. Of course, this new departure entailed more work, for which an additional 2 per cent. was charged. In large and important works it was a great relief not to feel bound within the limits of a contract, although in all these cases a careful approximate estimate was given, but the chief advantage was to the client, where the work was better done and at less cost than by contract.

Distinguished Clients.

Although Mr. Devey was not a well-known man, it is interesting to remember what a number of distinguished people he had as clients. Here are some of them: Her Majesty the late Queen Victoria, the late Duke and Duchess of Sutherland, the late and the present Duke of Argyll, Lords Granville, Spencer, Lytton, Kenmare, Lucan, Revelstoke, De L'Isle, Dunraven, Strathnairn, Northbourne, Vernon, Cranbourne, Stratford, Tankerville, Cranbrook, Carlingford, Rothschild, the Countess of Waldegrave, and a number of others. He was a welcome visitor whenever he went, and an ornament to any society. Children were always fond of him.

The late Earl Granville, a most genial and charming man, who, as Ambassador, had been to all the great Courts of Europe, was a very good friend and client. He would call at the office and walk off arm-in-arm with Devey, consulting him frequently on various matters of taste. He had great faith in Mr. Devey's judgment and advice. When the Earl was Foreign Minister, Devey would often dine with him at Carlton House Terrace (where he had made considerable alterations and improvements), and afterwards attend the receptions at the Foreign Office.

Mr. Devey held that it was

The Duty of the Architect

to carry out the wishes and ideas of his client—after submitting his own—and he would never try to force his ideas on any one. In making additions to a house, he would generally carry them out in harmony with existing work, however simple that might be. He altogether objected to the display of new architectural patches, of an entirely different character, so often seen, and so much like the self-assertion of the superior person.

Most of you are no doubt aware of the excellent biographical essay on Mr. Devey by my friend Mr. W. H. Godfrey, which gained the silver medal of the Royal Institute of British Architects two years ago, and of his later essay on Mr. Devey and his work—republished from "The Architectural Review" by Batsford. And for those who do not know it, I may mention that there are three volumes of Mr. Devey's small sketches in the library of the Royal Institute of British Architects.

---

*Abstract of a paper read by Mr. James Williams before the Architectural Association on March 5th, 1909.

The Last Journey

Mr. Devey made was to the Earl of Kenmare's, at Killarney, one of his largest works, and then on to Lord Dunraven's, at Adare, about some proposed additions, during which time he contracted a serious cold, resulting in pneumonia, from which he died at Hastings in 1886, in his sixty-seventh year. Feeling the need of more rest, as years increased, he had bought a charming old house at the east end of Hastings—a house, it is said, once occupied by three Duchesses of Sussex and at the same time—with good panelled rooms of the early Georgian time, facing the sea and sun, with a paved terrace and a summer house at each end. The house had been put in order with the assistance of his old friend the foreman before mentioned—who was devoted to him—when the end came after a few weeks' illness.

In conclusion, it is now more than twenty years since Mr. Devey died, but anyone who knew him intimately could never forget the impression he made on them. No words can express his natural charm of manner and refinement. Quiet, modest, somewhat reserved at first, at times vivacious, alert, full of humour, of deep feeling and genuine sympathy, considerate, thoughtful, kind and generous—showing great indignation against all injustice, and the warmest approval of everything noble and good. To all about him, in whatever position, he was ever the true gentleman, and, in every sense, a worthy member of your noble profession.

Mr. Arthur Keen proposed a vote of thanks to Mr. James Williams, who, he said, had, like Mr. Needham Wilson, a fortnight before, produced a paper of high literary merit. It should be remembered, he said, that Devey was most prolific in his designs when architecture was at a very low ebb. Glancing through volumes of the professional papers of half-a-century ago, he had been surprised at the very poor examples of domestic work they contained. Coming almost immediately after this period of mediocre art, the work of Devey, naturally, was a revelation. He regretted that no plans of Devey's houses had been given, for they manifested a remarkable facility of treatment. Regarding the gardens, it struck him that the very formal style usually observable in modern work was entirely absent from Devey's designs. Some fine examples of his work were given in the "Architectural Review" (volume 21, 1907), in an article by Mr. Walter H. Godfrey.

Mr. Needham Wilson, in seconding the vote of thanks, said his earliest impressions were gained from the work of George Devey, of whom he always had been a sincere admirer. He thought it was a pity that Devey should have been of such a retiring disposition. His work had practically no educational influence on his compeers. He never published his work in the papers, and until recent years had been almost unknown.

Mr. W. J. H. Leverton remarked that the delightful paper to which they had been listening recalled pleasing reminiscences of the visits of the Association to various notable houses. Coombe Warren was particularly convenient to any of the students who might be desirous of seeing some of Devey's achievements. It stood near Wimbledon Common, amid beautifully wooded scenery, and a good view of the house could be obtained from the road.

Mr. Henry Tanner, jun. (vice-president) observed that the paper was rather an unusual one, dealing as it did more with the home life than the architectural life of the architect. He agreed with Mr. Keen that some plans of George Devey's houses would have been valuable assets to the paper. He believed that in this respect Devey deviated greatly from the right angle and the straight line.

Mr. James Williams briefly replied.

INCORPORATED CLERKS OF WORKS ASSOCIATION.

Annual Dinner.

The 26th annual dinner of the Incorporated Clerks of Works Association was held on Saturday, March 6th, in the King's Hall of the Holborn Restaurant, Sir A. Brumwell Thomas, F.R.I.B.A., presiding.

The usual loyal toasts having been honoured, Mr. H. J. Mills submitted the toast of "The Architects and Surveyors." Great architects, he said, had left us legacies of which as Englishmen we were proud; the surveyors were a necessity of the time, and their value to them was untold.

Responding for the architects, Mr. Paul Waterhouse, M.A., F.R.I.B.A., said: I am under a great obligation to you this evening, for you have given me for the first time in my life the opportunity of responding to the toast of architecture: that is, of representing for the moment the great art which I serve. Of my unworthiness so to do I am fully aware; but the unworthiness, though it increases my embarrassment, does not decrease the pleasure of the honour. I notice that at dinners such as yours the gentleman who responds for architecture is generally reported as delivering a speech full of important information. You must forgive me if I refrain from talking business to-night. I spend, as do my brother architects, a good deal of time in talking business with clerks of works, and should enjoy a change, so please do not expect from me any weighty utterance. I am reminded of the story of that Duke of Burgundy who, wandering at night through his city, found a labouring rustic in heavy sleep. I compare myself for a moment with that slumberer—not too literally, for the man, I fear, was drunk, and I happen to be a water-drinker—but because of what followed. The Duke and his courtiers took the man to the palace, laid him in the Duke's bed; when he woke mystified in the morning, dressed him in ducal clothes, and paid him for a day the homage and honours due to an exalted personage. In being al-

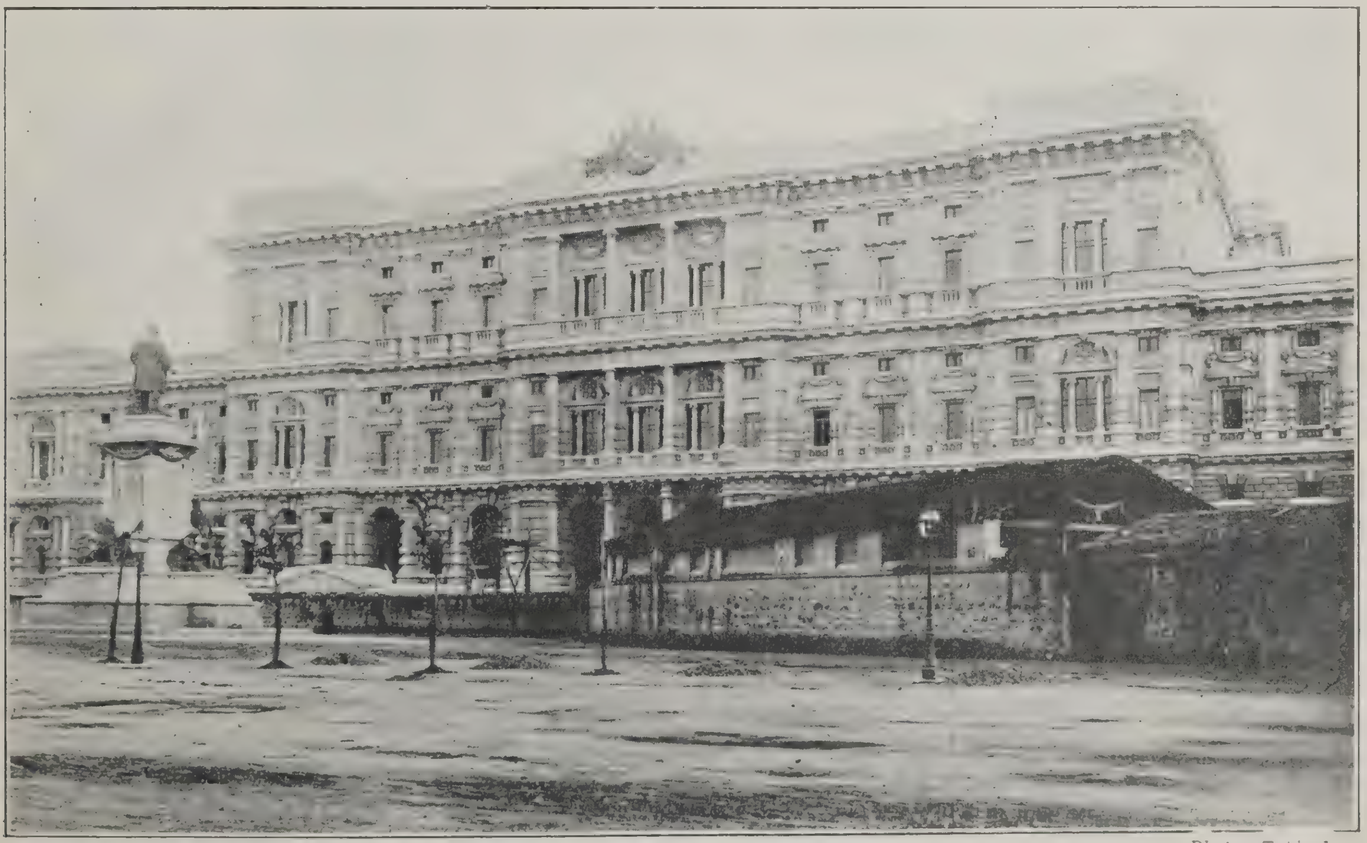


Photo: Topical.

THE NEW PALACE OF JUSTICE, ROME.

This building, which has cost 40,000,000 francs, is practically complete. It faces the River Tiber on the Place Cavour. The statue of Cavour has, however, been misplaced by the erection of the new building, and will probably have to be turned round.

lowed for a few minutes to stand before you as the representative of architecture, I accept and enjoy the unmerited honour much as that rustic may have done. I have been thinking of the many and various duties that fall to a man on the ground that he is an architect. [The speaker here produced a fragment of a list which he suggested might have been drawn up in his office, representing the incongruous knowledge that an architect is sometimes supposed to possess, and ranging from the theory of acoustics and the law of light and air to the extermination of blackbeetles!] To this (he continued) we must apparently add as an architectural accomplishment the spoiling of good dinners with bad speeches. But I forgive you for thinking, as others do, that an architect must necessarily be a speaker, because I value the opportunity of representing my art, and acknowledging most cordially its indebtedness to your craft. . . I acknowledge that if our duties are multifarious, yours are multifarious too. I am not, it is true, one of those who think it the duty of the clerk of works to make the full-size details and design the back elevation; but I do know, and very gratefully acknowledge, that there are in every building of importance hundreds of questions of technical significance in which the clerks of works renders his colleague the architect infinite help. . . It is only by your help that the architect is enabled to be what his name implies—a master workman—for you are the essential medium, on any large building, between him and his craftsmen.

Mr. H. J. Leaning, F.S.I., replied for the surveyors, and said that among the different types of clerks of works was the despotic clerk, usually appointed by a municipal body, and whose name was mentioned with a hush. The difficulty arose from the fact that he was appointed directly by the employer instead of by the architect, as all clerks of works ought to be. He (the speaker) looked forward to the time when there would be a qualification for membership of this Association, which ought to be a guarantee to architects of the efficiency of the men who were members of that body. He also hoped that before long there would be an increase in the salaries of clerks of works.

The toast of "The Builders" was submitted by Mr. R. H. Kellond, P.P.I.C.W., and in responding, Mr. J. Carmichael, president of Institute of Builders, said he was there first of all to do honour to their president, Mr. Fincham, as to whose great ability he was glad to testify. He was also delighted to be present to meet the members of the Association, one and all. Builders came in contact with these gentlemen every day, and he considered this Association to represent the cream of the clerks of works in London.

The toast of "The Worshipful Company of Carpenters" was submitted by Mr. J. G. Peacock, P.P.I.C.W., who said the Carpenters' Company were among the best friends of this Association, and were doing splendid work in the matter of technical education.

Mr. Maurice Hy. Pocock, the master of the Carpenters' Company, in responding, said he felt himself almost an anachronism in being present, because the Carpenters' Company was one of the most ancient of the City companies connected with building. The Company encouraged young men from all over the country to come and listen to their numerous lectures. He thought the one drawback to building in this country was by-laws, and he rather wished the old days of the Carpenters' Company "viewers" were back again.

The toast of the evening, "The Incorporated Clerks of Works Association," was proposed by the Chairman. They were, he said, all agreed that in the practice of architecture, in the carrying on of all that was best in the traditions of good building, there was no more pleasurable occupation in the whole field of the world's work. They all knew that beyond the pleasure in accomplishing something, which could be shown as a result, there lay, deeply implanted in mankind, what was called the instinct of workmanship, an instinct of keen pleasure in doing a thing, quite apart from the result obtained, and among the influences that had raised this simple instinct of doing a thing into the region of the ideal must be counted all those guilds and associations of men who had in all ages banded themselves together for the promotion and advancement of the art or craft to which they were specially devoted. Such an association was founded some twenty-seven years ago in the office of Sir Geo. Gilbert Scott, and it was his pleasure that evening to give to them the toast of the Association. The Association was formed for the promotion of good work and uniformity of practice in securing good work, but the constitution went still further and provided for intimate association among them in assisting one another with the difficulties that occurred in their work. They all knew these difficulties, and both they and he could look back upon work that they had carried out with pleasure, because tucked away in these buildings were the solutions of many practical difficulties with which they had had to cope. As they had before them that evening the first Benevolent balance sheet, showing a balance on the right side, he thought they might congratulate the Association on the position that it had achieved, and the only thing to wish was that the position might be maintained, and that the usefulness of the Association might be more widely promoted. The one matter uppermost in their minds was the question of succession, and those who were to follow after, the younger men who were to carry on the work that they were now doing. They had only to open their doors sufficiently wide to admit these younger men, and he believed they would have all the zeal and enthusiasm for their work and their Association that they required. The principles of construction and design saw many changes in these days, but he trusted that posterity would find in what they were doing to-day something that was a worthy link in the chain of the tradition of architecture. They did what was in them to do, and trusted that it would be accounted good. Might the next year bring better trade, good times for them all, and above all, prosperity to the Clerks of Works Association and its Benevolent Fund.

The toast was heartily responded to, and the President of the Association, Mr. A. Fincham, in acknowledgment, said he wished to express his personal gratitude to Sir A. Brumwell Thomas for his kindness. The question of the age of membership of the Association had always been a disturbing element, but his own observation of life's activities showed him that man's achievement was not always regulated by man's years. Unfortunately, the clerk of works was almost an exception to the rule. In their Association a few years ago, a man was considered too young at the age of 35, and had to be between 40 and 60 for some people's taste. He did not believe that himself. In most of the activities of life there was room for the old and the young. They had for years tried to get the best men in their ranks, and had sometimes lost sight of the fact that good men were to be found amongst the young ones. Well, they were going to try to get the younger men in now. He looked upon the Carpenters' Company as a sort of generating station, generating enthusiasm amongst young men and teaching them to become good craftsmen; and he liked to look upon their own Association as a sort of main distribution board, distributing the potent current that flowed from the architect's mind to the craftman's tool, and from the craftsman's tool to the acquired object; and he believed, with the Chairman, that if they tried to get the younger men amongst them they would find the enthusiasm at once. If any of those present wished to contribute to the pension fund, he hoped they would not do it because the members were old and incapable; it was to assist those men who had done good work and deserved some reward. The members of the Association, he thought, looked upon the love of their work as some sort of reward, and they sometimes thought too much of their work and too little of their pockets. Personally, he hoped it would continue to be so, because he wanted their young men to be imbued with the spirit of British craftsmanship which existed in their Association.

Other toasts were "The Visitors," proposed by Mr. J. Williams, vice-president of the Association, and replied to by Mr. Walter Cave, F.R.I.B.A., and Mr. Wm. Woodward, F.R.I.B.A.; "The Press," proposed by Mr. J. Brady, who paid a tribute to "The Builders' Journal," which, he said, "does good work in that wretched concrete business; it gives splendid information in connection with the work;" and "The Chairman."

Lecturing on farm-building construction before the New Deer (Scotland) Literary Association, Mr. James Cobban, architect, went back to Jabal's tent, the cave dwelling, and the crannog, and traced the gradual development of the buildings of the present day.

* * *

At a recent meeting of the London County Council, Mr. Greenwood, in answer to a question, said that the Royal Albert Hall had not been inspected by the Council as to its safety in case of fire. The Council had no jurisdiction to make such an inspection. He thought it would be well if such a large public building was, in the public interest, put under the same regulations as buildings under the licence of the Council.

* * *

The Council of the Surveyors' Institution have decided that after the election of members to be held in October, 1913, no examination candidate shall be eligible for election as a professional associate unless he has passed both the intermediate and final examinations of the Institution. As a consequence of this change, after the present year candidates for the intermediate examination will be allowed to sit at the age of nineteen, and for the final examination on completing their twenty-first year.

* * *

Stirred by the accounts of the ravages of tuberculosis, Mrs. W. K. Vanderbilt has given sufficient money to build four six-storey tenement buildings, to house 350 families, on the East Side of New York. These tenements are to be built on the latest design to procure light and air, and medical direction will be at hand to design accommodation specially fitted for the treatment of consumption. There will be extensive balconies, gardens, and ample air shafts to the interior of the buildings. It is the wish of Mrs. Vanderbilt that the rents shall be low enough to be within reach of the poorest, though it is hoped that the tenements will be self-supporting.

* * *

At the fourth ordinary meeting of the session of the Aberdeen Association of Civil Engineers, a paper, entitled "Notes on Cement Concrete," was read by Mr. J. W. F. Gardner, M.Inst.C.E., Caledonian Railway, Glasgow. Mr. Gardner referred to the importance of thoroughly testing the materials employed for making concrete. The cement should conform to the requirements of the British Standard Specification, and the author emphasised the importance of fine grinding the cement and of insisting upon the mortar tests in preference to the neat cement tests. The aggregate, consisting of sand and broken stone, should be as dense as possible, and the influence of the size of the grains of sand upon the voids in the mortar, and consequently upon the amount of cement required was shown by several tables. The author compared the strength of whinstone, granite, gravel, bricks, and other materials, and referred to the advantage of using machine-broken stone over hand-broken stone, on account of its lowest cost. The advantages of wet and dry mixtures for concrete were then referred to, and the necessity of thorough ramming and of careful inspection was insisted on.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Proposed Roof Truss.

YORKSHIRE.—A YOUNG ARCHITECT writes: —I enclose a tracing (not reproduced) for a roof which is proposed to be used over a recreation room in a club. Will you tell me whether the same is weak, either in the scantlings or constructionally. If so, will you be kind enough to say where, and suggest a size or sizes to be strong enough for the purpose? As to the pier, would it weaken it much to have a recess about 1¼ in. deep to take window frame.

The proposed roof is altogether too light in construction, and not well arranged, and the piers are insufficient to withstand the thrust of the roof. This is proved by working out the stresses as follows: Fig. 1 shows proposed trusses 26 ft. span, 8 ft. centre to centre; Fig. 2 the frame diagram with the addition of a king bolt, the external loads and the stresses being marked on. Fig. 3 polar diagram to give funicular polygon on Fig. 2, and obtain reactions. Fig. 4 the reciprocal stress diagram, allowing for a structural load of 28 lbs. per square foot and normal wind pressure of 21 lbs. per square foot. Fig. 5 shows the side elevation of pier with thrusts and loads. From calculations it appears that the maximum stress on the principal rafter would be nearly 70 cwt. per square inch, whereas the working stress should not exceed 6 cwt., and with regard to the piers, the maximum stress would be nearly 25 tons per square foot compression and 20 tons per square foot tension, whereas the working stress in tension should not exceed 3 tons per square foot. The calculations are as follows:—

For the principal rafter with a maximum compression of 85 cwt. and maximum bending moment of 199 cwt.—ft. = 2388 cwt.—in.

$$\frac{W}{A}+\frac{M}{Z}=\frac{85}{36}+\frac{2388}{\frac{1}{6}(6\times6^2)}=2{\cdot}31\pm66{\cdot}33=68{\cdot}64$$

cwt. per sq. in. compression. For the pier

$$\frac{W}{A}\pm\frac{M}{Z}=\frac{63}{1{\cdot}45}\pm\frac{63\times2\frac{1}{4}}{\frac{1}{6}(1{\cdot}12\times1{\cdot}3^2)}=43{\cdot}4\pm447{\cdot}4$$

= 490·8 cwt. or 24·54 tons per sq. ft. compression and 404 cwt. or 20·2 tons per sq. ft. tension. The whole scheme must be revised throughout.

HENRY ADAMS.

Designing a Sunday School.

To a question received from H. E. W. (Tottenham, N.) Professor Adams replies as follows:—

A proper plan, drawn to scale, should have been submitted. The sketches are so rough that it is impossible to make out what is required or where it is to be placed, and from the notes on the section it is more than doubtful whether it would be right to assist the correspondent. The only leading dimension given on the sketches is the span of the school roof, which is marked "about 60 ft.," and it is shown as a king post truss with two extra braces abutting on an unsupported part of the tie beams. Almost any book on building construction would give the elevation and scantlings for a satisfactory roof of this span. The girders cannot be calculated without knowing the extra distances of the piers between the windows, which are required to strengthen the walls. The paper by Mr. H. T. Buckland, on "Planning of Schools," given in this journal on the 10th and 17th February may be found useful.

Construction of Cesspool.

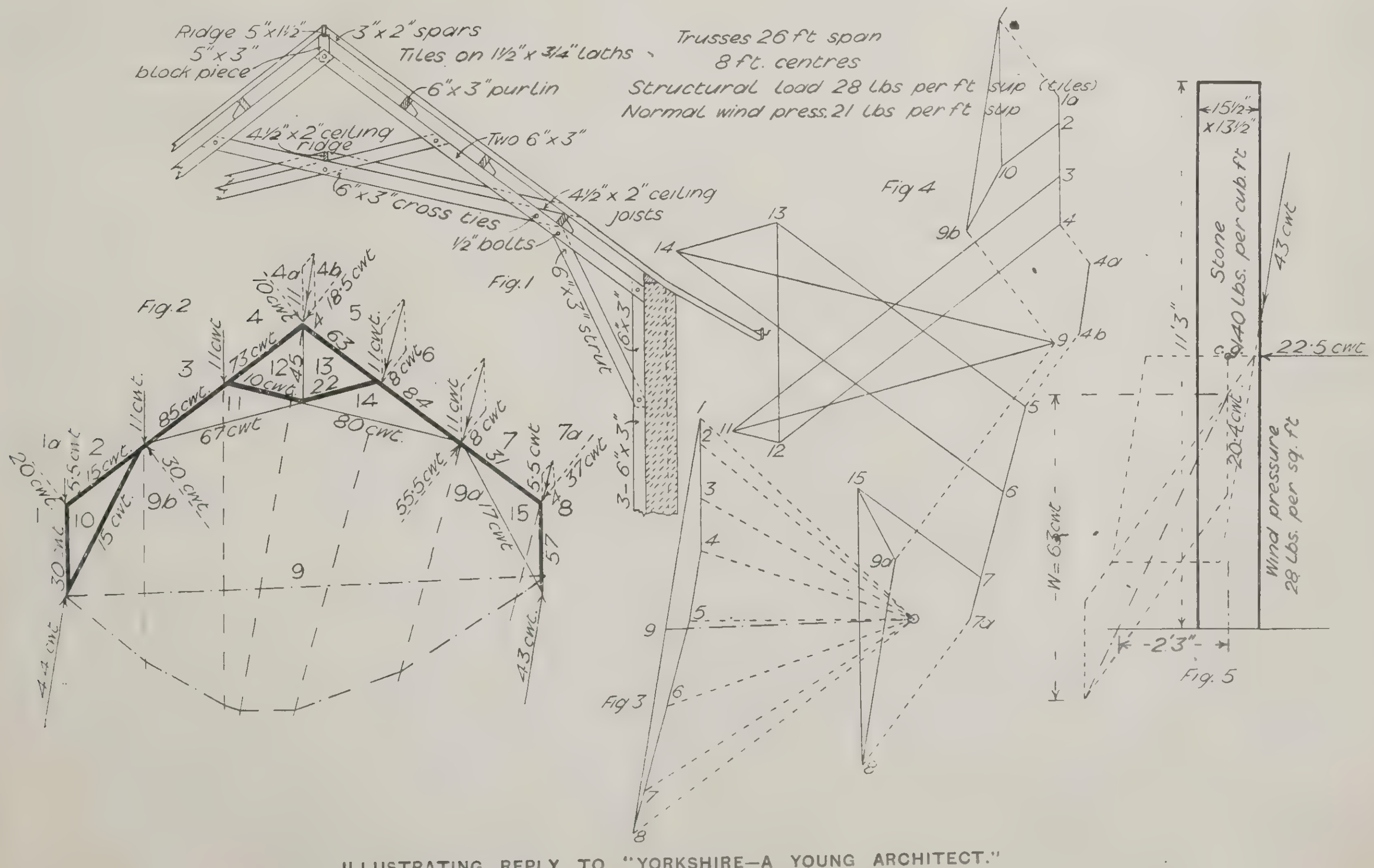
MORPETH.—W. H. writes: "Would you give me your idea of the best cesspool most suitable for the drainage of a country house?"

A cesspool for a country house should be on low ground, at least 50 feet, and preferably 100 feet, from the nearest point of the house, and from any water storage tank, deep well or stream. It should be steined with brick in cement 9in. thick, rendered inside with Portland cement (1 cement 1 sand) 1in. thick, or have 9in. thickness of puddled clay outside. It should be about 6ft. internal diameter and 10ft. deep, the top courses gathering over towards the centre so as to finish with an air-tight manhole ring and cover about 2ft. diameter. The bottom should be brick paved and rendered in cement. Near the top a 2in. vent pipe should be put in, to avoid the possibility of internal pressure, and carried up a height of not less than 10ft. plus an additional height equal to any horizontal length that may occur before it rises up. This pipe may be secured to a wall, or any old tree, except an elm, poplar, or fruit tree. An intercepting trap should be placed in the line of pipes near the cesspool, but it is not necessary to provide a fresh air inlet so as to have a constant current of air passing over the cesspool. If constructed as described above, anaërobic bacterial action will go on and liquefy the contents better than if thorough ventilation takes place. A pump should be fixed in a convenient position for pumping out the liquid contents and distributing them over the land, a float with iron rod being arranged to indicate the level. In all probability the cesspool would not require opening for seven years if the bath waste were excluded. This may be discharged into a dry steined well, and allowed to soak away.

HENRY ADAMS.

Foundation to Walls.

WOODBRIDGE.—TOBURG writes: "In your issue of February 10th, Mr. Adams suggests



ILLUSTRATING REPLY TO "YORKSHIRE—A YOUNG ARCHITECT."

a general rule for the thickness of concrete to foundations. There are several rules of thumb for obtaining this, but I should be obliged if you would give me a sound reasoning by both formula and graphics, such as would be accepted by a Court of Law as a just reasoning for obtaining this depth and also footings; in walls having footings both sides, and also all footings one side, as in the case of a wall next an adjoining property."

The concrete in foundations has two elements for calculation, horizontal area and depth. The area is so proportioned that the pressure on the soil below shall be within the limit of its supporting power, and the depth is made sufficient to prevent the edges from being broken off by a cantilever action. In general this is obtained by making the concrete 12 inches wider than the lowest course of brickwork (6 inches on each side), and not less than 9 inches thick. It will only be required thicker than this when it projects more than 6 inches or it is necessary to sink lower to reach a firm substratum. In the North of England brick walls are often built upon concrete "founds" without footings, but never in the south. The London Building Act is taken as a guide, the number of courses is equal to the number of half-bricks in the thickness of the wall, each projecting 2¼ inches on both sides, so that the bottom course become twice the width of base of wall. When the footings are on one side only of the wall the pressure is not uniformly distributed, and it may be necessary to make special calculations.

HENRY ADAMS.

Strength of Church Roof.

PRITTLEWELL.—A. B. writes: "Please state whether the roof shown in the accompanying sketch would be sufficiently strong."

The elevation of the proposed roof, with corrected details of joints, is shown in Fig. 1. The frame diagram will then be as in Fig. 2; and taking the structural load at 28lbs. per foot super, and the horizontal wind pressure at 42lbs. per foot super, the loading will be as shown and the reactions found as in Fig. 3. Owing to the form of truss, the dotted virtual forces must be introduced, the stress diagram Fig. 4 drawn out, and the stresses scaled off. For the principal rafter, with a stress of 125cwt. and a maximum bending moment of 84 by 5 by 12 = 5,040cwt.—in., try the 5in. by 20in. combined section given by querist.

$$\frac{W}{M} \pm \frac{M}{Z} = \frac{125}{100} + \frac{5040}{\frac{1}{6}(5 \times 20^2)} = 1.25 \pm 15.12 = 16.37$$

cwt. per sq. in. compression and 13.87 cwt. per sq. in. tension. For the 5 in. by 10 in. curved tie

$$\frac{W}{A} \pm \frac{M}{Z} = \frac{104}{50} + \frac{104 \times 19}{\frac{1}{6}(5 \times 10^2)} = 2.08 + 12.48 = 14.56$$

cwt. per sq. in. compression and 10.4 cwt. per sq. in. tension.

If the truss is made of solid oak, the maximum allowable stresses with a factor of safety of 4 are 14cwt. per square inch compression and 13cwt. per square inch tension taking net section. The scantlings may, therefore, be considered as just sufficient for a slated roof in a sheltered position; but if the position is exposed or the roof covered with tiles, the scantlings must be increased 1 inch in thickness, making them all 10in. by 6in. The curved timbers will require to be bent, or cut out of compass timber. Laminated members are not suitable for the stresses.

HENRY ADAMS.

Property in Old Material.

HEREFORD.—H. S. writes: "I thank you for the answer you have given to my query on page 184 of your issue of March 3rd, but the answer still leaves grave doubt in the matter, and as the question of "old material" is of special importance in many contracts, would it be too much to ask you to ventilate the subject? No doubt many architects and builders have had experience with old materials which would prove helpful in settling the question. "F. S. I." says that no doubt the contract must have been loosely drawn, but this was not so. The old material was of such a trivial nature that it did not seem worth drawing up any special clauses for. Still, the same difficulty arises as to the ownership of old material, whether in large or small quantities, when not specially mentioned in the contract, and the rightful ownership of same leaves great doubt, which it would be well to have thrashed out."

I fear I can add little or nothing to what I said previously upon this subject. I certainly think that if the building owner wished to reserve the old materials, or any part of them, his architect should have inserted a clause to that effect in the specification, or contract. To tell a contractor to clear the old materials away presumably means that he is to find a place to take them to, and that they are of no value to the owner any longer.

F. S. I.

Fungus Growth on Floor.

NOTTS.—SUBSCRIBER writes: "Having had considerable trouble with a boarded floor, owing to a fungus growing underneath, we cleared it all out of the joists, bonds and floor-boarding, and concreted the whole area 4in. to 5in. thick, laid wood joists in concrete, brought all up level, and laid the new floor-boarding on these joists. After two years the fungus is now showing again. Please advise."

The growth of this fungus is purely due to the absence of ventilation under the floor; though, perhaps, the boards have been also covered on top with some more or less air-tight covering—such as oil-cloth or linoleum. I fear I can suggest no remedy for the present state of affairs—the only thing that appears to have been possible to do (beyond what actually was done) when laying the floor, was to place the boards on tar, the joists being placed completely in the concrete were bound to rot, it was only a question of time.

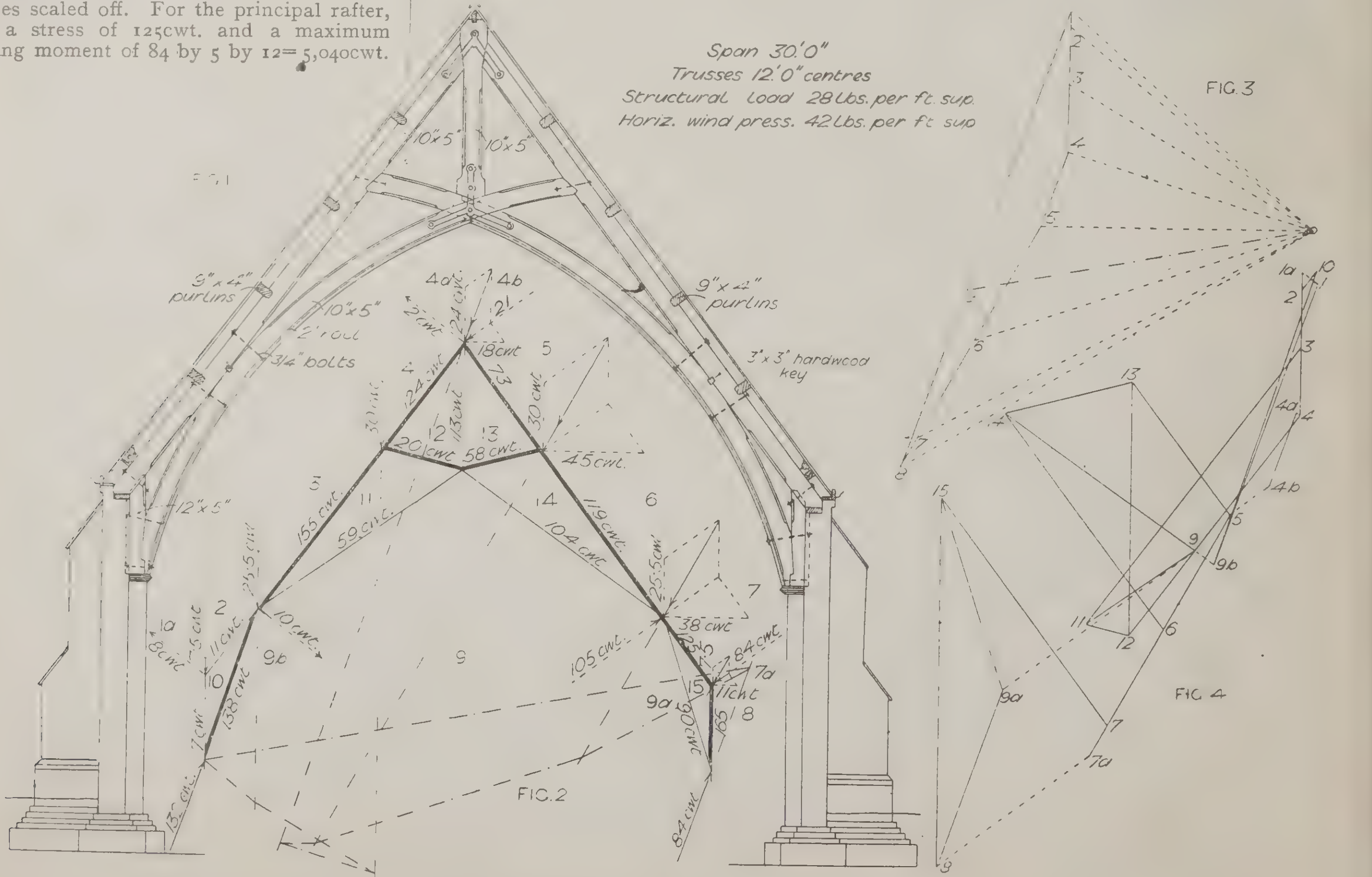
F. S. I.

Bankrupt Members of Local Authorities.

PROVINCIAL.—X. Y. Z. writes: "What is the position of an undischarged bankrupt (adjudication in 1899) elected a member of an urban district council last year? Is he eligible to sit on the council? If not, is he liable to penalties? Are the motions on which he has voted rendered null and void by reason of his being ineligible?"

I think the disqualification ceased five years after adjudication (Local Government Act, 1894, S. 46 (1) c.). The councillor was therefore eligible last year, and is not liable to any penalties.

B.



ILLUSTRATING REPLY TO "PRITTLEWELL.—A.B."

Architectural Societies.

Liverpool Architectural Society.

At the sixth ordinary meeting of the Liverpool Architectural Society, held on Monday, March 1st, in the rooms of the Society, 13, Harrington Street, Mr. H. Inigo Triggs delivered a lecture on "The Planning of Squares and Open Spaces."

The presence of an unusually large audience testied to the interest recently aroused in the subject by Mr. Lever's munificent donation to the School of Architecture of the Liverpool University, for the purpose of studying city planning.

The minutes of the previous meeting having been read, the President, Mr. F. G. Eccles, F.R.I.B.A., called upon Mr. Triggs to deliver his lecture.

After a consideration of the Greek and Roman methods of designs in fora and market-places, and the traditional survival of the system in some of the modern towns in Southern Europe, where there is a tendency to concentrate distinctly the important public edifices and to ornament the centres of common civic life with monuments and sculpture, the lecturer proceeded to contrast the salient characteristics of the Mediæval and Renaissance places—the general haphazard composition of the former, and the studied regularity and balance of the latter.

It was not till the beginning of the 17th century that the classic idea of symmetry was revived, one of the earliest instances of its practical application being the Place des Vosges, in Paris, laid out under Henry IV., when the form of a square was adopted. But, once initiated, the practice of designing regular open spaces, surrounded by uniform architecture, rapidly spread, and was soon imitated in England, where, in 1618, Inigo Jones was commissioned to lay out Lincoln's Inn Fields. In Italy itself, almost the first example was the colonnaded approach to St. Peter's, at Rome, between 1655 and 1667. Its elliptical form, essentially a classic conception, descended in direct line from the circuses and ancient amphitheatres, was copied in many Italian towns: the Piazza del Plebiscite at Naples, and the Piazza S. Nicolo at Catania, are perhaps the best known instances.

Mr. Triggs next dealt with the planning of modern "Traffic Places"—*i.e.*, places which are designed to deal with streams of traffic at points where several streets converge. The first essential of such places, whether of the simplest type, consisting of only two intersecting thoroughfares, or the most complex, including islands, is that they should absorb and distribute the various lines of traffic readily, and should properly provide for the safety of pedestrians.

From diagrams by Eugene Hénard, it was demonstrated that, in order to obviate the risk of collision at a traffic place, the gyratory system of circulation was the most satisfactory, though no attempt has been made to test it in this country.

A century ago the invention of the rond point (which seems to have owed its origin to French garden planning of the 17th century) appeared to be the great solution of the traffic-place problem, but the idea, though architecturally, and on paper, a fine one, is unsatisfactory in actual action. Even the largest example, the Place de l'Etoile, though relieved by a subsidiary outer traffic circle, is frequently impassable.

A discussion of the comparative values of circular, oval, square and other forms in place design, brought Mr. Triggs to the concluding portion of his lecture—the treatment of garden-places, the class of open space laid out solely for the purpose of a garden, and called in London, squares. For such a city garden the formal treatment is, of course, the only one to be considered seriously: it must be designed in direct relation to the surrounding architecture, and any embellishments, such as stone steps or terraces, fountains or statuary, must be parts of the scheme, making it a complete whole. There should be a fixed number of sites for future use, the utilisation of which completes the original design and excludes the possibility of future introductions. Usually the placing of statuary is quite a farce, and appears an obvious afterthought.

The lecture terminated with the suggestion for the formation of a Civic Improvement Committee, the architectural members of which could use their influence to further the beautifying of Liverpool.

Prof. Reilly, in proposing the vote of thanks, said that improvements might be expected in the character of the future development of the city: the establishment of a Chair of Town Planning at the University would arouse public interest in the subject, and the publication, from time to time, of ideal drawings for Liverpool and other towns made by the professor to be appointed, could not fail to result in an improvement of the existing state of affairs.

Mr. Rathbone, in supporting the vote of thanks accorded to Mr. Triggs, expressed his opinion that the present Liverpool Corporation were not utterly impossible of access on the question, though he confessed they were a little difficult; as, for example, when a deputation approached the city engineer with regard to the unworthy appearance of the Landing Stage entrance, the latter replied that it was built of the best bricks. Still, Mr. Rathbone thought that if sufficient social pressure were brought to bear, some improvement might be effected.

Gloucestershire Architectural Association.

The February meeting of this association was held at Gloucester, the president (Mr. H. W. Chatters) in the chair, when Mr. M. H. Medland read a paper entitled "An Account of the Roman and Later Buildings Found on the Site of the Wilts and Dorset Bank, Gloucester," which was illustrated by lantern slides. Commencing with the remains of the Roman basilica, Mr. Medland described as far as possible the successive buildings that have stood on this historic site, the Saxon and Early English churches replaced by that of All Saints' of the 14th and 15th centuries, and succeeding these the later civic buildings of the 16th, 17th and 18th centuries. Numerous slides of the architectural and other remains of all the buildings were shown, amongst which may be mentioned as especially interesting those of the Roman figures, the early mediæval ornaments, and the 17th and 18th centurty Tolseys. The lecturer also gave much historical information as to the history of the city connected with these buildings, and mentioned that the copper Sanctus bell of one of the churches is now in Exeter Museum. Discussion followed, after which, on the proposition of Mr. F. H. Bretherton, seconded by Mr. T. Malvern, a hearty vote of thanks to the lecturer was passed.

Obituary.

The death is announced of M. Alfred Normand, the *doyen* of the Académie des Beaux-Arts. Born in Paris on June 1st, 1822, M. Normand was entered in 1839 at the Ecole des Beaux-Arts as a pupil of his father, M. Henri-Marie Normand, the architect and engraver, and was awarded in 1846 the *grand prix* in architecture for designs for a natural history museum; and his "Study and Restoration of the Roman Forum," made in 1850, was admitted to the Universal Exhibition of 1855, and awarded a medal of honour. Appointed sub-inspector of public buildings, he completed, between 1855 and 1857, the Pompeian house, constructed for Prince Jérôme Napoléon in the Avenue Montaigne, and in 1873 he re-erected the Vendôme Column, which had been destroyed by the Communists. Later, he built the hospital of Saint-Germain-en-Laye. He was an officer of the Legion of Honour, and it was in 1890 that M. Alfred Normand was elected member of the Académie des Beaux-Arts.

Views and Reviews.

The Art of the Plasterer.

The Art of the Plasterer. An account of the Decorative Development of the Craft, chiefly in England, from the XVIth to the XVIIIth Century. By George P. Bankart, Architect and Craftsman. London: B. T. Batsford, 94, High Holborn. Price 25s. net.

Mr. Bankart will, it is hoped, forgive the gracelessness which finds itself unable to share his regret "that an art so extremely interesting and unique as that of the plasterer should have escaped record and consideration in any collected form at the present day"; for one feels it was worth while waiting till he should, in good time, take his task in hand himself, and give us his special knowledge of the art.

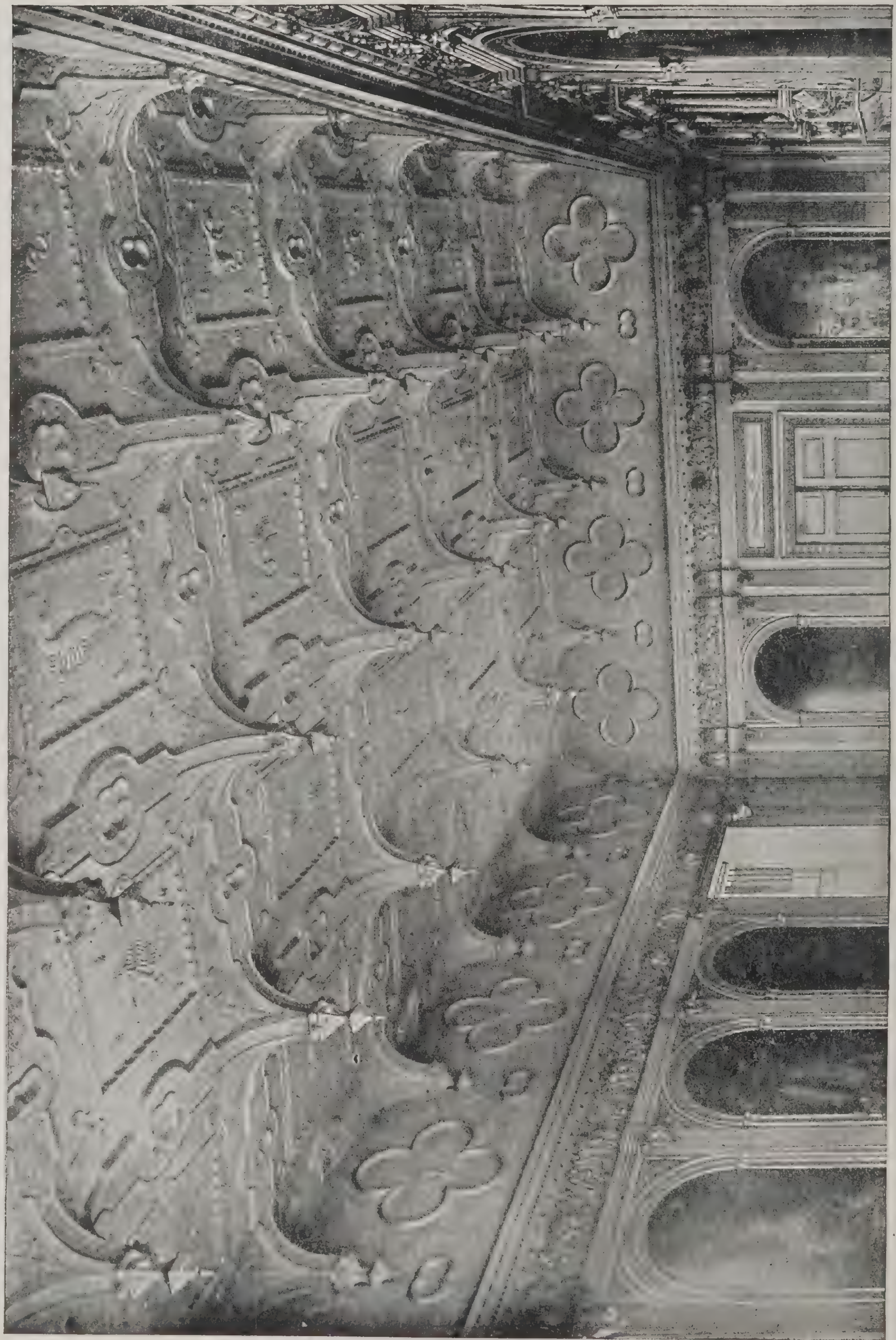
In the preface the author pays a fitting tribute to Mr. Millar's book, "Plastering, Plain and Decorative," and in his entirely needless apology for writing the work now under review, he draws attention to the fact that the former deals more particularly with the technical side of the art. In the recently published volume, Mr. Bankart has given us a most interesting historical survey of the subject.

The introduction (Chapter I.) reflects the author's hope and belief that the present reawakening of the handicrafts connected with the great art of building will give an impetus to "Plaster," as a medium of decorative expression. This is a wholesome start, and is a point of view seldom taken by writers on ancient crafts, who, by sounding the note of despair, do a great deal of mischief in the direction of making people believe that nothing modern can ever be good. But Mr. Bankart is careful to stipulate that a full knowledge of the capabilities of the material on the part of men with refined ideas, is a necessary condition to a revival of the plasterer's art.

A material which, in the author's words, "is intensely susceptible to every touch received from the hand of the worker" and "can be modelled, cast, incised, coloured, stencilled, or stamped with equal freedom, from the size of a cameo to the vastness of a dome," is one which surely provides a generous scope in its application. Instances of its use in ancient times for mirrors are also on record, and the inevitable Pliny mentions its employment by goldsmiths of early times for the sinking of "dies," in preference to wax. So delicately can it be manipulated, that at Pompeii are to be seen numerous examples of modelled stucco in such low relief that it is hardly greater than in the lacquer-work of the Chinese. Vitruvius, who was nothing if not thorough, has a good deal to say about its preparation, and the recipe in use in his day includes such ingredients as juice of figs, rye-dough, hogs' lard, curdled milk, blood, etc. These and many other most interesting facts concerning the "stucco-duro" of ancient times may be read in greater detail in the chapter devoted to this period of its history.

Chapter III. describes how the Italians of the fifteenth century, in seeking for sculpture of classic times, discovered, as a result of excavations amongst the ruins of the Baths of Titus, that the walls were covered with fine paintings and stucco work, of which nothing was hitherto known. This led to a revival of the art, to which the experiments of Giovanni da Udine owed almost everything, for it was he who produced a material similar in nature to the old, and left for posterity a proof—in his decorative work at the Vatican—of his mastery over it.

"Stucco-duro in England" is the title of the next chapter, which gives a short account of the work of the foreigners invited over to this country by Henry VIII. Their influence soon made itself felt, the result being that though the native craftsman showed ignorance in handling the human figure, he developed an extraordinary versatility in ornament, and in course of time the way was paved for the evolution of a national style suited in every way to our environment and habits of life.



THE "FISH" ROOM—CEILING, AUDLEY END, ESSEX. *From* "The Art of the Plasterer.")

Subsequent chapters lead up to a description of the English School of Plasterwork (Chapter VII.). By this time the material (stucco-duro), owing to various difficulties in obtaining and working it, was superseded by ordinary plaster or mortar. As a consequence, the native plasterer soon responded to the new conditions, and in the remotest villages very creditable attempts were made to decorate the ordinary homes of the people. The foreign expert had disappeared, and the art he left behind became, in the hands of humbler workmen, more closely identified with the national life. In the earlier years of this school, little more was attempted in the way of ceiling decoration than easily repeated patterns of panelling formed by moulded ribs of plaster. The mouldings were of simple section, as will be seen by reference to Fig. 127 in the volume. With experience grew ambition, and our old mansions illustrate the degree of perfection and exuberance the art of plastering at length achieved. Ceiling ribs were now double-moulded, and contained within the intervening spaces, running enrichments; pendants also made their appearance, and added much grace and richness. A very beautiful ceiling (formerly in the Old Palace, Bromley-by-Bow) may be seen at the Victoria and Albert Museum, in which these features are conspicuous.

Chapters on Scottish and Irish Plasterwork—both exceedingly good—precede a very exhaustive account of the plasterwork of the Later Renaissance. This was frankly Classic in feeling, and seems to have been introduced (to a large extent) by Inigo Jones, who derived it from Italy. He made use of moulded ribs of much greater size than had formerly been the custom in Elizabeth's time, and the panels were necessarily of simpler form and larger dimensions. Italian workmen were employed—as well as English—and the name of Nicholas Stone (among the latter) is mentioned. Typical London examples of this period are those at Ashburnham House, Westminster; and several of the City churches, notably St. Stephen's, Walbrook, and St. Swithin's, London Stone. Provincial examples are very numerous—among the best being the very rich work at Belton House (Grantham, Lincolnshire).

Mr. Bankart includes a chapter on "The Eighteenth Century Degeneration," and points out the inferiority of plasterwork generally from the death of Wren onwards. The variety and vigour of the work done under him were almost entirely wanting in that executed under his successors. Following in the wake of this degeneracy came yet another invasion of Italians, and the style of the French Court (Louis XIV. and XV.) became the fashion of the day. The author quotes a passage from a vigorous protest written in 1756 by the architect Ware, who considered this particular class of design "little less barbarous than Gothic." This was the age of the treatise on building—illustrated with copper-plate engravings—showing the manner in which every conceivable ornamental form was to be set out, in rigid, unvarying proportions, based on that most unaccommodating and inspiration-sapping invention—the module. The plasterers, like every one else, slavishly following these instructions, helped to lower the general standard, and their work was meaningless and mechanical in consequence.

The brothers Adam have a chapter to themselves. The outcome of close study in Italy, their work was largely borrowed from Rome, and, although it lacked inventiveness, we can agree that it was unquestionably "graceful and refined in design, delicate and subtle in modelling, though somewhat feeble in its relief." It is unpleasant to have to note that these gentlemen were financially interested in a special compound which they used in their work in such vast quantities.

Coming to our own times, we have in Chapter XIII. a description of modern plasterwork, in which are included illustrations of some very charming work executed by the author. It is interesting to observe, however, that though Mr. Bankart prefers broken-backed circles and distorted ceiling ribs to the more accurate work of the present time, his own work is quite normal in both respects, and where flowing ribs occur they do not appear to be other than perfectly graceful. It is very difficult to believe that the old-time craftsman was other than an indifferent workman, doing his very best under the circumstances.

The author illustrates (in colour) a portion of a modelled and coloured frieze executed by himself, and describes the method he employed. To those engaged in practical work as plasterers this should prove of value and interest. Judging from the illustration, the original must be exceedingly pleasant as a colour scheme.

A chapter of "Notes addressed to Students and Apprentices" concludes the book, which is one that can be described as essential to architects and plasterers. Its most conspicuous feature is the profusion of illustrations (many of them being from scale drawings), all of which are good, and of sufficient size to be of real use. The author and publisher are to be congratulated on the production of a most important work.

Popular Electricity.

Popular Electricity. By Walter Hibbert, F.I.C., F.C.S., A.M.I.E.E., Lecturer on Physics and Electro-Technology at the Regent Street Polytechnic. With about 200 illustrations. 3s. 6d. Cassell and Company, Ltd., London, New York, Toronto and Melbourne.

If the architect does not, like Bacon, take all science for his province, he must at least know something about electricity. This book offers "a bird's-eye view of the many applications of electric energy," and the intrusion into its title of the suspicious word "Popular" must not be taken to imply, as, in too many instances it does, purely superficial treatment. This is, indeed, a book from which all but the professional expert may learn a great deal that is useful and interesting with respect to the electrical methods by which, as the author remarks, "so many industrial occupations are now invaded." The book is fully illustrated with useful diagrams, which really elucidate the principles involved; and altogether it can be recommended as providing the means of an intelligent general understanding of the subject.

The Use of the Slide Rule.

Handbook for the use of the Slide-Rule. With special instructions for the "Reitz" Pattern. By A. H. Angus, B.S., Head Master George Dixon Secondary School, Birmingham. Published (price 6d.) by B. J. Hall and Co., Ltd., Drawing Office Stationers, 39, Victoria Street, London, S.W., and 32, Paradise Street, Birmingham.

In the hands of a careful man, having some proficiency in "the mathematics," the slide-rule is an instrument of wide utility. This concise manual exhausts the calculations that it is usual to perform on the slide-rule, and puts the mathematician in a fair way to devise further applications for himself. The general principles are tersely and lucidly explained, the various ways in which the slide-rule can be advantageously employed are enumerated, and rules for finding squares and square roots, cubes and cube roots, mantissæ of logarithms, and sines, cosines, tangents, etc., are expounded, as well as the more elementary calculations to which the slide-rule can be adjusted. So simple, concise, and eminently practical a manual is sure to be widely appreciated.

A dividend at the rate of 5 per cent. per annum, free of income-tax, was declared at the 21st ordinary general meeting of the Patent Victoria Stone Company, Ltd. Mr. W. T. Douglass, M.Inst.C.E., who presided, stated that the company had naturally suffered from the prevailing depression in the building trade, but mentioned that the past two months had shown an improvement, and that the company had received very fair and substantial orders.

Notes and News.

The Society of Architects will pay an official visit to the Building Exhibition at Olympia on Friday, April 23rd, by invitation of the Executive.

* * *

A sanatorium for women is proposed by the health committee of Bradford City Council, and it is suggested that, as a preliminary measure, certain sanatoria that are of approved construction shall be visited with a view to obtaining information and guidance. The proposed sanatorium is for fifty beds.

* * *

The new elementary schools at Failsworth, which are being built under the supervision of Mr. Henry Littler, the Lancashire county architect, are now approaching completion. The concrete floors, constructional steelwork, and fireproof floors were constructed by Messrs. Homan and Rodgers, Manchester, the concrete being finished ready to receive boards nailed direct.

* * *

At a meeting of the Glasgow University Geological Society, a paper on "Building Stones, with Special Reference to their Behaviour in the Glasgow Atmosphere," was read by Mr. R. Boyle, B.Sc., who remarked that the primary test of a building stone consisted in the microscopic examination of a thin slice, and chemical analysis should only be used to elucidate the petrographical structure. A cementing material of silica is the best for the Glasgow atmosphere, and one of carbonates the worst. The presence of alumina up to about 1½ per cent. is only deleterious when in the form of ordinary clay. The Permian red sandstones of the South of Scotland withstand the Glasgow atmosphere best. In them the cementing medium is mostly iron peroxide, to which the red colour is due. Actual crushing tests collected and plotted by the writer show that the strength of a sandstone as determined from cubical specimens should be reduced about 10 per cent. Standard test specimens should have a height equal to 1½ times the least width. Flat surfaces should be avoided in buildings as far as possible. Projecting ledges, cornices, and string courses, should be given a top slope, and in the case of some stones should be initially coated with concrete, oil paint, or other preservative.

* * *

Sheffield, where the prevailing conditions are most provocative to a study of the pollution of the atmosphere by smoke, has been selected as the first provincial city in which to hold a smoke-abatement exhibition and conference, and the exhibition, which remained open for three weeks, brought together a very interesting collection of appliances for preventing smoke and of fuel guaranteed not to smoke. Sir Oliver Lodge, in opening the exhibition, said that for house heating the ideal method was a combination of open fire and pipes, open fires in the rooms and pipes in the passages. He deprecated, however, our present open coal fires. He was convinced that before long we should have gas laid on in large quantities for heating and cooking purposes, and should depend much more in the future on electricity for lighting and gas for heating and cooking. He only hoped that at an early day some town in England would try the experiment of having the gas made at the coal pit, where coal was cheap, bringing the gas to the consumer in pipes, as water and electricity were now brought, and forbidding the importation of crude coal into the town. They might supply great quantities of gas at a very cheap rate and get it used for all purposes. If one town would try the experiment and it succeeded, other towns would imitate it. He hoped to live to see that accomplished. One or two towns, he believed, were already thinking about this. The purification of the air was one of the most important factors in the improvement of the conditions of life.

Federation News.

THE NORTHERN CENTRE OF THE NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS.

Secretary: James Denver.

There is nothing to report from the Northern Centre, no meetings of the council having been held.

Arrangements have been made for the next meeting of the Council to be held in London, on Wednesday morning, April 21st, at 10.30 o'clock, and it is hoped that members of the council will avail themselves of the invitation to visit the International Building Trades Exhibition the day previous.

The Northern Centre Board of Conciliation for the Building Trade.

A special meeting of the Northern Centre Conciliation Board was held at the Liverpool Association Board-room, 24, Sir Thomas Street, Liverpool, on Wednesday afternoon, February 17th, at 2.30 o'clock.

Two appeals were before the Board:—(1) From the Birkenhead local board, with reference to a firm of Liverpool contractors working in their district and observing the Liverpool working rules; and (2) from the Liverpool Operative Masons' Society, claiming a firm of masons at Rainhill to be Liverpool employers.

The appeal from Birkenhead was taken first, and Mr. H. W. Wellings, the operatives' secretary to the local Board, stated, on behalf of the operatives, that the firm referred to had secured a contract in their district, and, although they had been approached on several occasions, they refused to adhere to the Birkenhead rules, owing to the Liverpool radius being ten miles from the landing stage, which radius covered the whole of Birkenhead and many miles beyond.

Other members spoke on behalf of the operatives, and claimed that the Liverpool boundary was never intended to extend to the Cheshire side of the Mersey. Mr. G. P. Snape, chairman of the local board, stated, on behalf of the employers, that, although he consented to a meeting of his Board being held, he felt they had no jurisdiction in the case, as he was sure the employer was quite within his rights in working to Liverpool rules, although the work was in their district. He also informed the meeting that they had observed the difficulty and trouble of the two districts overlapping, and both the Birkenhead and the Liverpool employers had given notice, prior to this dispute arising, to have the same altered.

Mr. B. B. Moss also spoke on behalf of the Liverpool employers.

After hearing the evidence of the witnesses and giving the points full consideration, the following resolution was unanimously agreed to:—"That this Board, having heard the evidence respecting the dispute in Birkenhead between a firm of Liverpool contractors and the Operative Bricklayers' Society, find they have no jurisdiction in the matter, but desire to point out to the employers and operatives, both at Birkenhead and Liverpool, the desirability of altering their rules so that there shall be no overlapping in the boundaries."

The appeal from the Liverpool operative masons was then considered, and Mr. Moss stated that the firm complained of were members at St. Helens; and though the appeal had been lodged in the first place with the Liverpool association, they felt they had no claim over the firm owing to their not being Liverpool members, and therefore the appeal had been forwarded direct to this Board. Mr. Rice, on behalf of the operatives, claimed the firm to be Liverpool employers, owing to their work being on the Liverpool side of the boundary arranged by this Board some short time ago; but the firm claimed that, as they were members at St. Helens, they were bound by the rules of that town. After hearing the evidence of the witnesses, a resolution was passed appointing two members to visit the district, and ascertain on which side of the boundary the works were situate, their decision to be the decision of the Board.—JAMES DENVER, Secretary.

LANCASHIRE, CHESHIRE, AND NORTH WALES FEDERATION OF BUILDING TRADES EMPLOYERS.

The administrative committee of the Lancashire, Cheshire, and North Wales Federation of Building Trades Employers held their monthly meeting at the Board-room, Manchester, on Friday, February 12th, at 2.30 o'clock, when the president (Mr. William Bullen) presided over a good attendance of members.

A letter was read from the president of the reorganised Accrington Association, thanking the committee for the steps they had taken in bringing the employers in that town again into line, and expressing the hope that application for affiliation to the Federation would be sent on shortly, which was considered very satisfactory.

Correspondence was read from the Heywood Association with reference to the Heywood Post Office contract, and after hearing explanations on the subject, the secretary was instructed to write to the Heywood Association thereon.

The draft of a proposed fair wages clause, as sent down by the National secretary, was carefully considered, and approved.

The rules of the Lancaster Association were recommended for adoption, subject to one or two slight amendments.

A circular letter from the National Federation *re* the National form of contract was considered, and it was decided to forward a copy of the same to the local associations, and invite their views thereon.

A recommendation from the Conference of Secretaries, held on January 22nd, was before the meeting, requesting that they be allowed to hold half-yearly conferences in future, which was unanimously agreed to.

A case was reported from the Bolton Association, where one of their members had signed a form of contract agreeing to the architect being the sole arbitrator, with the result that the architect had refused to allow for extras to a considerable amount. After considering the case at some length, it was agreed to assist the Bolton Association in the matter by appointing a sub-committee to investigate the case if required to do so.

The quarterly meeting of the Plasterers' Trade Committee of this Federation was held at the New Boar's Head Hotel, Bury, on Wednesday, February 24th, when Mr. J. B. Johnson, Liverpool, presided over an attendance of 17 representatives from the various federated towns.

Several matters of trade interest were considered, including the fixing and finishing of plaster partitions, the election as a chairman of a member of the Administrative Committee, the use of patent materials, the N.A.O.P. agreement, etc., etc.

A case was reported from Manchester, where the Operative Plasterers' Society had laid against an employer certain charges, which, on investigation, were considered to be unfounded The case was dealt with at considerable length, and ultimately it was agreed that, as the matter was of such importance to the trade, the Manchester Association be requested to furnish this committee with a full report of the case at a later date.

A well-written paper was read by Mr. James Cadman, of Swinton, Manchester, entitled "Our Federation: Its Aims and Ideals." Mr. Cadman dealt principally with the present state of the trade—unremunerative prices, unfair competition, and the benefits to be derived from membership of the Federation. A vote of thanks was afterwards passed to Mr. Cadman for the trouble he had taken in preparing and reading his paper.

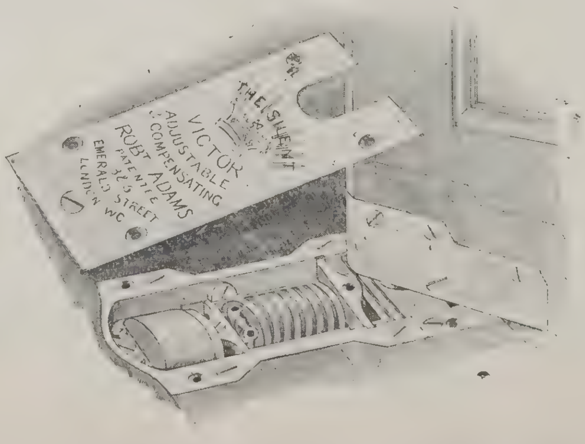
It was decided to hold the next quarterly meeting at Southport.

The representatives were afterwards entertained to tea by Mr. John Hamer, master plasterer, of Bury, to whom a hearty vote of thanks was accorded for his hospitality.

Messrs. Hall and Pickles, iron and steel merchants, 64, Port Street, Manchester, with branches in Birmingham, Newcastle, and Swansea, have issued an elegant leather-bound pocket list of metal joists, beams, channels, girders, plates, etc., giving particulars that will be of great assistance to builders and architects in measuring up quantities.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST., LONDON, W.C.

PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE,
with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.

60 HIGHEST AWARDS.

**The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing.**

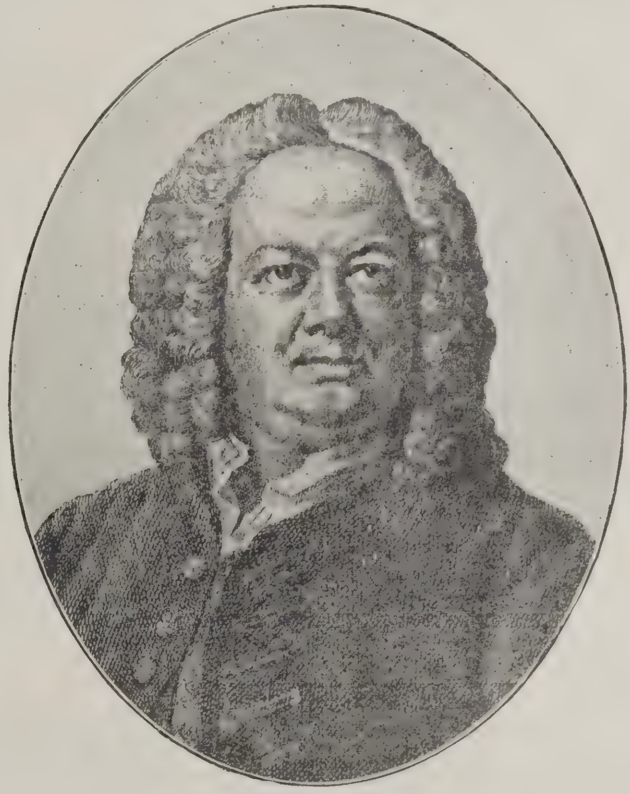
— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

Practical Notes for Architectural Draughtsmen,

By ALFRED W. S. CROSS, M.A., F.R.I.B.A.
and ALAN E. MUNBY, M.A., A.R.I.B.A.

STUDENTS

Preparing for the Examinations of the R.I.B.A., can learn how to draw The Orders correctly with the smallest possible amount of study and work by utilising the invaluable drawings and data given in this publication.



JAMES GIBBS.

Price for Complete Work, 12/-, including Portfolio.

We shall be pleased to forward a copy of this work on approval to any of our subscribers.

◎

PART I.

The Orders and their Application.

Introduction.

The Four Orders.

The Tuscan and Doric Orders in detail.

The Ionic and Corinthian Orders in detail.

Details of Imposts and Arch Moulds.

Order upon Order and Intercolumniation.

Doorways and Pediments.

Windows and Entablatures.

Windows, rusticated treatment.

Venetian and other Windows.

Niches and their Treatment.

Block Cornices, Balusters, Entablatures and Entasis.

PART II.

Details of the Orders.

Rules for Setting out the Volutes of the Ionic Capital by (1) Gibbs and (2) Vignola and Palladio.

Details of Ionic and Corinthian Capitals.

Examples of Arcading (Ionic and Doric).

Examples of Arcading (Tuscan and Corinthian).

PART III.

Constructional Details.

Domes.

Pendentives, Circular Staircases and Wreathed Columns.

Gothic Tracery and Vaulting.

PART IV.

Perspective.

Notes on Architectural Perspective.

Setting up a Perspective.

PART V.

Shadows.

Explanatory matter regarding the projection of Shadows.

Examples illustrating Shadows on various architectural details.

◎

Descriptive Leaflet sent post free on application to—

THE MANAGER, TECHNICAL JOURNALS, LTD.,
Caxton House, Westminster, London, S.W.

Publisher's Notices.

Offices: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address: "Buildable, London."

Telephones: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application.

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abingdon.—For additions to the "Dog House" Inn, near Abingdon, for Messrs. Morland and Co., Abingdon. Mr. J. G. T. West, M.S.A., architect, The Knowl, Abingdon:—

Buckle and Sons	£1,060	0	0
G. H. Wheeler	992	0	0
A. Cox	938	8	0
Thatcher and Sons*	885	0	0

*Accepted.

Bangor.—For erection of a cottage on Gorad Road, Upper Bangor. Mr. W. G. Williams, architect, 202, High Street, Bangor:—

Roberts and Williams	£1,014
J. M. Jones	929
Jones and Williams	867
W. Parry	817
Roberts and Owen...	806
Watkin, Jones and Son,* Bangor ...	765
J. Owen	655

*Accepted.

Barking.—For the erection of a new police station at Barking. Mr. J. Dixon Butler, F.R.I.B.A., Surveyor to the Metropolitan Police, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son, and Chidgey, 8, Aedlphi Terrace, Strand, W.C.:—

F. C. Minter	£10,992
Harris and Wardrop	10,595
Trollope and Son and Colls and Sons, Ltd.	10,523
Ashby and Horner	10,420
Higgs and Hill, Ltd.	10,364
Treasure and Son, Ltd.	10,300
Dowsing and Davis	10,200
J. C. Garbett	10,110
Hammond and Son	9,997
J. W. Jerram	9,990
Willmott and Sons	9,957
Lovatt, Ltd.	9,890
Lawrence and Son	9,792
Godson and Sons	9,733
Mowlem and Co., Ltd.	9,680
Jarvis and Sons, Ltd.	9,660

Bridlington.—For erection of three houses, St. John's Street, for Mr. A. J. Stevenson. Mr. C. F. Johnson, architect and surveyor, Westgate, Bridlington:—

J. H. Hudson	£1,034	10	0
W. Hoggard	969	13	0
A. A. Booth	886	0	0
C. Gant	880	0	0
F. Martindale	878	0	0
R. Musk and Son*	874	0	0

All of Bridlington.
*Accepted.

Daventry.—For constructing sewage outfall works and laying sewers in the parish of Staverton, for the Daventry R.D.C. Mr. J. B. Milliams, engineer, The Moot Hall, Daventry:—

Palmer	£1,398	0	0
Firth and Co.	1,233	10	0
Dixon	1,219	5	7
Bosworth and Wakeford ...	1,095	0	0
Martin	1,090	0	0
Wilmott	1,080	6	0
Watson	1,032	0	0
Webster*	935	0	0

*Accepted.

Milford Haven.—For the erection of a house in North Road, Milford Haven, for Mr. G. E. Jones. Mr. C. Launcelot Blethyn, architect, Milford Haven:—

Phelps and Owens	£700	0	0
F. Lloyd and Co.	689	0	0
A. Heatherley and Co., Pembroke	655	0	0
Cole and Sons	650	0	0
S. Scott	602	0	0
Henry Adams	565	10	0
E. T. Powell*	546	10	0

*Accepted.
Rest of Milford Haven.

Newport, Mon.—For making and forming a new road, being a diversion of the Newport and Bedwas road at Church Road, in lieu of Volland Hill, for the Monmouthshire County Council. Mr. William Tanner, F.S.I., county surveyor:—

W. J. Reeves, Rogerstone ...	£1,678	16	10
J. Jenkins, Ltd.	1,528	10	0
J. Dix	1,527	2	0
A. J. Rossiter, Caerphilly ...	1,500	0	0
W. C. Shaddock, Plymouth ...	1,463	8	5
J. C. Trueman, Swanley, Kent	1,449	0	0
R. Pomeroy and Co., Cardiff...	1,425	4	8
Barnes, Chaplin and Co., Cardiff	1,365	6	3
W. L. Meredith, Gloucester ...	1,354	8	6
C. H. Reed	1,350	0	0
H. C. Parfit	1,290	0	0
H. Smith	1,241	0	0
E. Osmond and Sons,* Ely, Cardiff	1,227	1	1

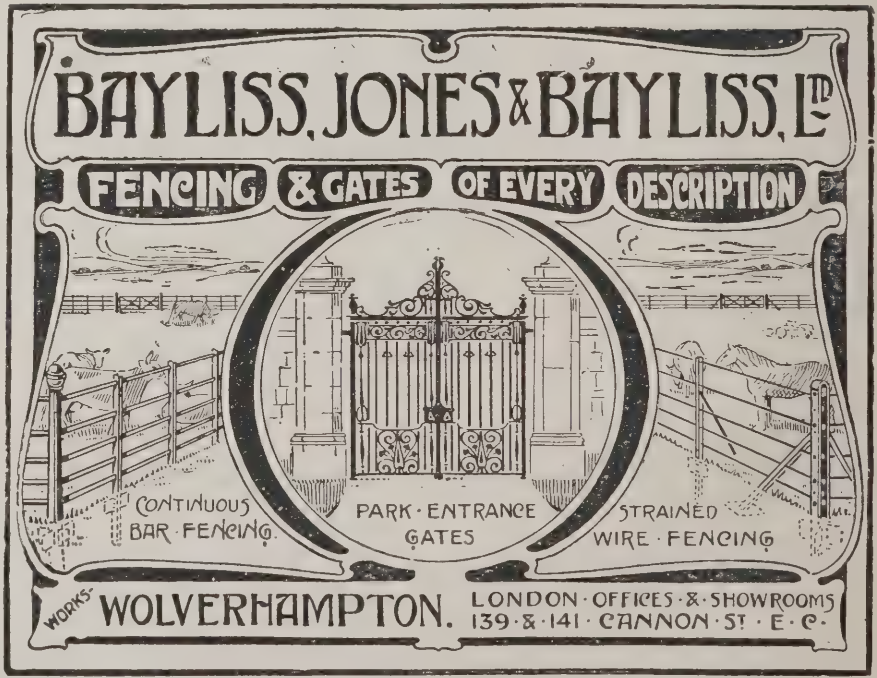
Rest of Newport.
*Accepted.

(*Tenders continued on page viii.*)

ROOFING SLATES.
Velinhell, Penrhyn and Westmorland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

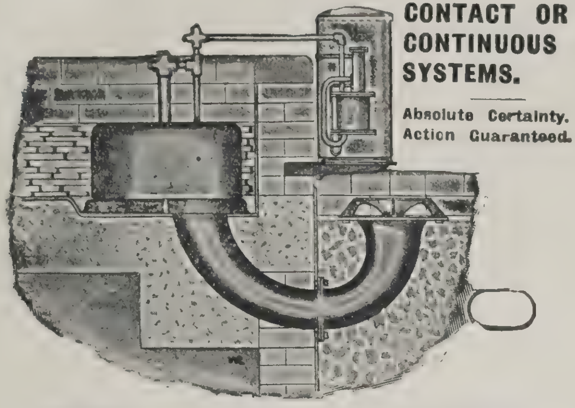
(EST. 1887).
CITY OF LONDON
AND
FINSBURY DRAWING OFFICES
(LEWIS PITCHPINE, Manager),
Working Drawings,
Perspectives,
Designs,
Tracings,
Prints,
Quantities,
Telephone—1099 Central
Telegrams—"PITCHPINE, LONDON."
63, FINSBURY PAVEMENT, LONDON, E.C.

Do you wish to better your position?
An Advertisement in the "Builders' Journal" will be the least expensive and most thorough way of making your desire known. See Special Rates on this column—3 insertions for the price of 2.


BAYLISS, JONES & BAYLISS, LTD.
FENCING & GATES OF EVERY DESCRIPTION
CONTINUOUS BAR-FENCING
PARK-ENTRANCE GATES
STRAINED WIRE-FENCING
WORKS WOLVERHAMPTON.
LONDON-OFFICES-&-SHOWROOMS 139-&-141-CANNON-ST-E-C-

FOLDING PARTITIONS.
REVOLVING SHUTTERS.
Hartley Bros.,
2/- ft. Super.
1/- ft. Super.
GORTON, MANCHESTER.

BACTERIAL TREATMENT
OF SEWAGE.



CONTACT OR
CONTINUOUS
SYSTEMS.

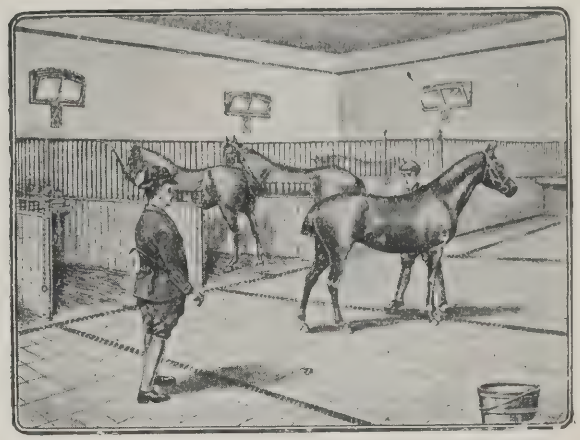
Absolute Certainty.
Action Guaranteed.

PATENT ALTERNATING SYPHONS.

PATENT TIMING SYPHONS
(requiring no auxiliary brick chambers).
PATENT ROTARY DISTRIBUTORS
FOR TRICKLING FILTERS.
PATENT SEWER FLUSHING SYPHONS.

BURN BROTHERS,
Sanitary Engineers,
3, Blackfriars Rd., LONDON, S.E.
ALSO AT EDINBURGH.

CARRON



Stable, Cowhouse and Piggery Fittings.

ARE made on strict hygienic principles from specially selected material They are free from imperfections such as rough surfaces, sharp edges and projecting corners. They are well-designed, fitted and finished, and represent the highest attainment in their line. Adopted by the principal Stock-Breeders, Corporations, and by the leading nobility and gentry throughout the land.

Plans and Estimates on request.

CARRON FITTINGS may be inspected at the Company's Showrooms :— London (City)—15, Upper Thames Street, E.C. : (West End)—23, Princes Street, Cavendish Square, W. : Liverpool—22-30, Red Cross Street ; Manchester—24, Brazennose Street ; Bristol—6, Victoria Street ; Newcastle-on-Tyne—13, Prudhoe Street : Birmingham—218, 220, 222, Corporation Street : Glasgow—125, Buchanan Street : Dublin —44, Grafton Street.

No. 8 Stable Fittings Catalogue forwarded on request.

CARRON COMPANY
INCORPORATED BY ROYAL CHARTER 1773
CARRON
Stirlingshire.

HOSPITALS, INFIRMARIES, SCHOOLS, &c., REQUIRE
MANCHESTER STOVES, GRATES, & VENTILATORS.
E. H. SHORLAND & BRO., Drake Street Works, MANCHESTER.

**LIGHTNING
CONDUCTORS**
Supplied, Erected and Tested. Chimney Shafts Restored, &c.
J. LEWIS, 5 & 6, Great Winchester Street
LONDON, E.C.
TELEPHONE No. 3053 CENTRAL.

BUTTERS BROS., CRANES for CONTRACTORS
WATERLOO STREET, GLASGOW.

"LIMPET" PATENT BOLTS & WASHERS
FOR CORRUGATED IRON SHEETS.

"There is no doubt in our mind that they ought to be regularly specified where iron sheeting is used."—*Vide* BUILDERS' JOURNAL.

PRICE'S PATENT

The latest and most approved Fixing for joining Corrugated Iron Sheeting together.

REGISTERED TRADE MARK
LIMPET

Their great feature is the way in which they adjust themselves to the corrugation and make an **absolutely watertight joint.** They also retard the corrosive action in Galvanized Sheets and combine other advantages.

EXCLUSIVELY ADOPTED BY THE INDIAN GOVERNMENT, THE LEADING RAILWAYS AND MANY OF THE LARGEST MANUFACTURING CONCERNS IN ENGLAND AND THE COLONIES.

Full particulars and samples from the Managing Agents—
WILLIAM JACKS & CO., 5, East India Avenue, LONDON, E.C.
Agents for Scotland : Frank G. Price & Co. 53, Waterloo St., Glasgow

(Tenders continued from page vi.)

Enfield.—For the erection of a block of schools at Lavender Road, for the Education Committee. Mr. G. E. T. Lawrence, architect, 22, Buckingham Street, Adelphi, W.C. :—

		Addition if glazed brick facing for interior walls adopted.
W. J. Ballard and Co. ...	£20,420	... £1,603
L. and W. H. Patman ...	19,785	... 2,160
Myall and Upson	19,000	... 2,084
W. Pattinson and Sons, Ltd.	18,787	... 1,638
A. N. Coles	18,562	... 2,076
Kirk and Randall	18,546	... 1,872
F. and G. Foster	18,444	... 1,998
J. W. Jerram	18,269	... 1,450
J. Appleby and Sons ...	18,260	... 1,740
T. Hickman	17,995	... 1,520
R. A. Lowe and Co. ...	17,982	... 1,211
W. Moss and Sons, Ltd....	17,937	... 1,435
F. and C. Davey, Ltd. ...	17,785	... 1,319
A. Fairhead and Son ...	17,667	... 1,365
B. and G. Nightingale ...	17,636	... 1,466
A. Monk	17,475	... 1,420
W. J. Fryer	17,450	... 1,425
J. S. Hammond and Son..	17,387	... 1,230
Brand, Pettitt and Co. ...	17,380	... 1,550
Clark and Sons	17,325	... 1,150
Fitch and Cox	16,920	... 1,920
W. Lawrence and Son	16,840	... 1,330
T. J. Hawkins and Co ...	16,824	... 1,391
W. J. Maddison	16,723	... 1,364
H. Knight and Son,* Tottenham, N.	16,527	... 1,234

*Accepted.

Fochriw, Wales.—Accepted for new infants' Council school at Fochriw, for the Glamorgan County Council. Mr. D. Pugh-Jones, Cardiff, county architect :—

F. Bond, Beda Road, Cardiff, £3,082 15s.

Hoddesdon, Herts.—For erection of a new school at Hoddesdon, for the Hertfordshire County Council. Mr. W. A. Smith, county surveyor, Hatfield :—

P. Steed, City Road, N. ...	£3,028	0	0
D. W. Barker, Croydon ...	2,777	0	0
A. Negus and Son, Cambridge	2,709	0	0
J. A. Hunt, Hoddesdon	2,639	0	0
A. A. Sedcole, Commercial Road, E.	2,627	0	0
C. Hale and Co., Harringay, N.	2,586	0	0
Fitch and Cox, Enfield ...	2,530	0	0
C. S. Foster and Son, Loughton	2,517	0	0
Clark and Son, Cambridge ...	2,450	0	0
W. Lawrence and Son, Waltham Cross	2,448	0	0
F. Hitch, Ware	2,425	0	0
P. R. Paul, Waltham Abbey ...	2,378	0	0
Jennings and Grenfell, Waltham Cross	2,350	0	0
H. Norris and Son,* Hertford...	2,283	15	0

Architect's estimate, £2,335 3s. 7d.

*Accepted.

London.—For supply of six static transformers, required for use at the Elephant and Castle substation for the London County Council :—

W. E. Burnand and Co., Sheffield	£2,727	10	0
British Thomson-Houston Co., Ltd., Cannon Street, E.C. ...	2,716	0	0
Electric Construction Co., Ltd., Wolverhampton	2,427	0	0
General Electric Co., Ltd., Witton, Birmingham	2,284	0	0
British Westinghouse Electric and Manufacturing Co., Norfolk Street, W.C.	2,112	0	0
Dick, Kerr and Co., Ltd., Abchurch Yard, E.C.	2,092	0	0
British Electric Transformer Co., Ltd.,* Hayes, Middlesex	1,879	0	0

Chief Officer of Tramway's estimate, £2,000.

*Recommended for acceptance.

Pembury.—For erection of new buildings at the workhouse infirmary, for the Tonbridge Union Guardians. Mr. S. Philpott, architect, High Street, Tunbridge Wells :—

F. G. Elliott, Cranbrook	£627	0	0
Sykes and Son	498	15	0
Roberts and Co.	490	0	0
Soper and Jones	461	0	0
G. and F. Penn, Pembury ...	453	0	0
Stanbridge and Son	452	12	0
Goodwin Bros.	447	0	0
J. Crates	444	0	0
E. Smith	435	0	0
F. Burr	428	0	0
Pannell and Sons,* Tonbridge ...	413	0	0
K. C. Jarvis, Tonbridge	410	0	0

Rest of Tunbridge Wells.

*Accepted.

Raynes Park.—For the erection of pair of semi-detached villas, Raynes Park, S.W. Mr. R. B. Rowell, A.R.I.B.A., architect, Triangle Corner, East Sheen, S.W. :—

A. J. Riggs	£635
E. H. Cooper	628
R. T. Hughes and Co., Ltd.	590
Meech and Goodall	553
W. E. Nash	475
A. Burton	465
A. Judson,* Station Road, Hanwell ...	400

*Accepted.

Stratford-on-Avon.—For alterations and additions to 13, John Street, Stratford-on-Avon, for Mr. Robert Garrett. Mr. Albert H. Callaway, architect, Union Chambers, Stratford-on-Avon. Quantities by architect :—

Fincher and Co.	£915
J. Cox	875
E. T. Kennard	836
G. Whateley and Sons	820
J. Harris and Sons*	788

All of Stratford-on-Avon.

*Accepted.

Walthamstow.—For erection of St. Oswald's Mission. Messrs. Olley and Haward, architects :—

Thomerson and Son	£2,860
A. G. Barton	2,697
Patman and Fotheringham	2,543
W. Gladding and Co.	2,397
J. W. Jerram and Co.	2,278
G. J. Hosking	2,243
Spencer, Santo and Co., Ltd.	2,239
F. J. Coxhead	2,195
C. R. Price	2,157
Sheffield Bros.	2,075
W. Shurmur and Sons, Ltd.	2,070

Insurance.

Free £500 Accident Insurance Coupons have been sent to the following :

W. B. (Keighley), J. J. S. (Stockton-on-Tees), E. C. H. (Frinton-on-Sea), J. S. (Belfast), A. O. H. (Bromsgrove), E. G. (Leeds), J. B. O. (Brighton), A. S. T. (Frinton-on-Sea), N. F. (Leeds), S. A. (Preston), F. G. L. (Manchester), J. C. (Preston), G. H. L. (Beckenham), W. R. (Pimlico), F. W. A. (Peterborough), R. F. G. (Market Rasen), H. C. (Bridport), H. C. (London, E.C.), A. W. (Barnsley), G. M. (Kensington), J. H. O. (Malpas), J. W. G. (Leeds), F. G. F. (Manchester), J. B. K. (Bridgend), R. M. McD. (Castleford), C. C. C. (Great Yarmouth), G. T. H. (Westminster), J. J. (Chelsea), A. L. T. T. (Dorchester), W. E. S. (Crediton), S. B F. (Crediton), W. T. J. (Ogmore Vale), T. S. (Ashford), F. M. M. (Shrewsbury), W. A. W. (Liverpool), E. J. G. (Hinckley), W. G. P. (Birmingham), J. M. J. (Sheffield), M. C. F. (Liverpool), F. C. R. J. (Torquay), A. C. (Macclesfield), W. J. B. (West Croydon), A. R. (Waltham Abbey), H. B. (Middlesbrough).

T. C. (Dublin), W. W. (Liscard), F. J. F. (Derby), T. A. B. (Morley), W. A. (Whitehaven), T. M. (Stalybridge), H. S. (London, N.W.), A. W. G. P. (Bedford), E. C. K. (Highgate), R. McA. (Helensburgh), J. M. C. K. (Londonderry), W. J. G. (Taunton), J. E. C. (Shepherd's Bush), F. W. P. (Armley), T. W. C. (Smethwick), R. W. S. (Filey), T. H. T. (Derby), C. W. (Kendal), J. M. I. (Kilmarnock), W. W. (Altrincham), W. B. (West Hartlepool), G. M. (Chester), G. P. (Harpenden), J. H. H. (Norwich), G. R. (Northwich), J. A. H. (Aberdeen), F. V. L. (Wimbledon), P. S. (Dublin), G. A. M. (Belfast), B. M. (Tenby), E. C. M. (Edinburgh), G. T. (Sidmouth), H. B. J. (Brynmawr), E. L. (Birmingham), W. P. M. (Kingsbridge), R. F. T. (London, W.), A. W. S. (Fulham), W. G. (London, S.E.), J. T. C (Brixton Hill), W. G. (Camberley), A. D. (Ealing), D. A. L. (Aberdeen), A. A. G. (Harrogate), W. S. (Sunderland), A. C. H. P. (London, N.W.).

'Phone Holborn 1562.

The Brilliant Sign Co. 1907 Ltd.

Original Manufacturers of Brilliant Sunk Gilt Copper Window Letters.

THE LARGEST MANUFACTURERS IN THE WORLD OF

PLATE GLASS FACIAS
STALLPLATES
SWING SIGNS
GILT WOOD LETTERS
ILLUMINATED SIGNS
(of every known style)
REPOUSSÉ COPPER WORK
WINDOW LETTERS

Guaranteed Best Work—Keenest Rates in the Trade.

60 pp. Illustrated Art Catalogue Free.

Wire: "Signboards, London."

38 Grays Inn Rd London W.C.

BRILLIANT SUNK GILT COPPER PLATE GLASS FACIAS, &c.

PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART

TELEPHONE No 9492 Central

MEASURES BROS LTD 53B SOUTHWARK ST LONDON S.E & PITLAKE, CROYDON

TELEPHONE No 171 CROYDON

10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.

SECTION SHEETS, BOOKS & PRICES ON APPLICATION.

CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.

STEEL SHAFTING, from 2½ in. to 8 in. diameter an up to 36 feet long, always kept in stock.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must contorm to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

March 25. HOMERTON, E.—Erection of two house coal stores at the Eastern Fever Hospital, Homerton Grove, Homerton, E., for the Metropolitan Asylums Board. Particulars at the office of the board, Embankment, E.C., upon deposit of £1. Tenders by 10 a.m. on March 25, at the office of the Board.

March 25. MAIDSTONE.—Erection of a coal-shed at the Mereworth Council School, for the Kent Education Committee. Particularge of the correspondent, Miss K. Morton, West Pavilion, Mereworth Castle, Maidstone, to whom tenders are to be sent by March 25 (see also "Plumbing and Sanitary").

March 25. LYTHAM.—(a) Construction of foundation and floor for a new bandstand, (b) painting bandstand after erection, and (c) construction of an enclosure to same, for the U.D.C. Particulars of the surveyor to the Council. Tenders by noon on March 25, to Chas. A. Myers, clerk to the council, council offices, Lytham.

March 26. LIGHTCLIFFE.—Erection of a house at Lightcliffe. Particulars of Joseph F. Walsh and Graham Nicholas, F.R.I.B.A., Museum Chambers, Halifax, up to March 26.

March 26. ELLAND.—Erection of three shops at Elland. Plans may be seen and bills of quantities obtained of C. H. Petty, architect, 12, Waterhouse Street, Halifax, up to March 26.

March 26. CROWCOMBE.—Erection of a detached residence on the Crowcombe Heathfield Estate, for Geo. R. Cover. Tenders by March 26, to F. W. Roberts, F.R.I.B.A., architect, 2, Hammet Street, Taunton, of whom particulars may be obtained.

March 26. NETHERTON, near HUDDERSFIELD.—Erection of a residence in Crescent Road, Netherton. Particulars of J. B. Abbey and Son, architects and surveyors, 34a, New Street, Huddersfield, to whom tenders are to be sent by March 26.

March 26. ABERTHIN (WALES).—Erection and completion of a dwelling house, etc., at Aberthin. Plans, specification, and form of tender, from Robert Llewellyn Evans, architect and surveyor, Penllyn Court, Cowbridge. Tenders to Isaac Collier, Pleasant View, Aberthin, near Cowbridge, by March 26.

March 26. DENNY.—Construction of new station buildings at Denny, for the Caledonian Railway Company. Drawings at the office of the company's engineer, Buchanan Street station, Glasgow. Specification and schedule on deposit of £2 2s. Tenders by March 26, to J. Blackburn, secretary, Caledonian Railway Company's Offices, 302, Buchanan Street, Glasgow.

March 26. CARDIFF.—Construction of foundations and drainage of a new county hall in Cathays Park, Cardiff, for the Glamorgan C.C. Particulars of Harris and Moodie, 8, New Square, Lincoln's Inn, London, W.C., and at the office of the clerk. Tenders, with names and addresses of two sureties, by March 26, to T. Mansel Franklen, clerk to the C.C. Glamorgan C.C. offices, Westgate Street, Cardiff; fair wages clause.

March 27. WHITEHAVEN.—Erection of two semi-detached houses at Victoria Road, Whitehaven, for Tom Burns (all trades except plumbing and glazing). Plans and specification of J. S. Moffat and Bentley, architects, 53, Church Street, Whitehaven, to whom tenders are to be sent by March 27.

March 27. WESTBURY (WILTS.).—Erection of a new cloak room and construction of washing facilities, at the Edington and East Coulston Council School, Tinhead, Westbury. Plans and specification at the school. Tenders by March 27, to J. H. H. Hillman, Westbury, Wilts.

March 27. GOLBORNE, NEAR WIGAN.—Alterations and additions at Parkside Mill School, Golborne, for the Lancashire education committee. Plans, etc., at the office of the county architect, on deposit of £2. Tenders before noon, on March 27, to Henry Littler, county architect, 16, Ribblesdale Place, Preston.

March 27. GUILDFORD.—Erection of a Nurses' Home for the guardians of the poor of the union. Plans, etc., at the offices of Edward L. Lunn, architect, 36, High Street, Guildford. Application, accompanied by deposit of £3 3s., to the architect, by March 18. Tenders by 9 a.m. on March 27, to W. S. V. Cullerne, clerk to the guardians, union offices, Commercial Road, Guildford.

March 27. WILLESBOROUGH.—Construction of new offices and drainage at Willesborough Council School, for the Kent Education Committee. Particulars upon application to the school correspondent, W. J. Spicer, 27, Romney Road, Willesborough, Ashford, Kent, or Fras. W. Crook, secretary, Caxton House, Westminster, S.W. Tenders to the school correspondent by March 27.

March 29. CWMGWRACH, near GLYNEATH.—Erection of a detached house at Cwmgwrach, for Thomas Jones. Drawings and specification at the office of the architect. Tenders by 5 p.m. on March 29, to J. Llewellin Smith, M.S.A., architect, Aberdare.

March 29. QUEENSFERRY.—Re-roofing public baths with cement concrete and alterations and repairs, for the Corporation. The burgh surveyor will point out the work. Offers with the burgh chamberlain, Queensferry, by March 29.

March 29. STANFORD-LE-HOPE (ESSEX).—Erection of boys' and girls' schools to accommodate 528 children at Stanford-le-Hope, for the Essex Education Committee. Names by March 29, to Christopher M. Shiner, A.R.I.B.A., architect, 10, John Street, Adelphi, W.C.

March 29. TALYWAIN (WALES).—Erection of a house at the "Woodlands," Talywain, for Mr. Joshua Hopkins. Plans and specifications at the offices of A. Gordon Babbidge, architect and surveyor, Clarence Chambers, Pontypool. Tenders by March 29.

March 29. WYMONDHAM.—Erection of Baptist Church, Wymondham. Plan and specification, etc., of A. F. Scott, architect and surveyor. Tenders by noon on March 29, to Rev. J. Turner, care of A. F. Scott, architect and surveyor, 24, Castle Meadow, Norwich.

March 29. NEWCASTLE-UPON-TYNE.—Alterations and additions to Westmorland Road council school, for the Education Committee. Plans and specification at the education offices, Northumberland Road. Bills of quantities upon deposit of £2 2s. Tenders by noon on March 29, to A. C. Coffin, secretary, education offices, Northumberland Road, Newcastle-upon-Tyne.

March 30. DUNTON, near BRENTWOOD.—Repairing Dunton Council School, near Brentwood (5 miles), for the Essex Education Committee. Specifications of F. W. Bittles, clerk of the committee, Brentwood, to whom tenders are to be sent by March 30.

March 30. BRIGHOUSE.—Excavators, masons, bricklayers, carpenters and joiners, plumbers and glaziers, slaters, plasterers, painters, heating and ventilating engineers, and electrical engineers works at Brighouse Secondary School for Girls. Names to the architects, Sutcliffe and Sutcliffe, New Road, Hebden Bridge, before March 30.

March 30. PENTRE.—Erection of 10 houses in Llangyfelach Road, Pentre, of concrete, or alternatively of brickwork and slated roofs, for the corporation of Swansea. Drawings at the office of the borough surveyor, 13, Somerset Place, from whom specification and quantities on deposit of £1 1s. Tenders by noon on March 30, to Jno. Thomas, town clerk, Guildhall, Swansea.

March 31. LEWES.—Erection of a new public elementary school at Ashurst Wood, in the parish of Forest Row, for the East Sussex Education Committee. Names and addresses to F. J. Wood, county surveyor, county hall, Lewes, by March 31.

March 31. MONMOUTH.—Erection of a new cookery kitchen at Jones' elementary school, Monmouth. Particulars of the architect, George F. Grimwood, Monmouth, on deposit of £2 2s. Tenders at Vizard and Son's office, by noon on March 31.

April 1. BALLSBRIDGE, IRELAND.—Alterations at the town hall, Ballsbridge, for the Pembroke D.C. Tenders by April 1, to J. G. Manly, clerk to the council, town hall, Ballsbridge, Pembroke, Co. Dublin, of whom all particulars may be obtained.

April 1. BIRDWELL.—Erection of a working men's club and institute at Birdwell. Particulars of R. and W. Dixon, architects, 5, Eastgate, Barnsley, to whom tenders are to be sent by 10 a.m. on April 1. Fair wages clause.

April 3. SLOUGH.—Internal alterations to Cedar House, Slough, for the U.D.C. Particulars of the surveyor to the council, 1, Mackenzie Street, Slough, on deposit of £1 1s. Tenders to the chairman of the U.D.C., 1, Mackenzie Street, Slough, by 1 p.m. on April 3.

April 3. WHITTINGTON MOOR, near CHESTERFIELD.—Erection of school, to accommodate 432 infants, for the C.C. Particulars of the architect to the committee, St. Mary's Gate, Derby, on deposit of £1 1s. Tenders by 1 p.m. on April 3, to George H. Widdows, A.R.I.B.A., architect, county education offices, St. Mary's Gate, Derby.

April 5. BIRKDALE.—Erection of new aisle and vestries, St. John's Church, Birkdale. Plans and specification at the church, and at the office of the architects. Bills of quantities of Wright and Son, surveyors, Lancaster. Tenders by noon on April 5, to Austin and Paley, architects, Lancaster.

April 6. HINCKLEY.—Erection of public baths for the U.D.C. Drawings and specification at the council offices. Copies of quantities on deposit of £2 2s. Tenders to E. H. Crump, A.M.I.C.E., engineer and surveyor, before noon on April 6.

April 6. DEWSBURY.—Execution of masons', joiners', plumbers', slaters', plasterers', painters' heating, and electric lighting engineers' trades, in nurses' home. Particulars from the architect, W. Hanstock and Son, Branch Road, Batley, on and after March 26. Tenders to Joseph Peace, clerk, union offices, Dewsbury, by 5 p.m. on April 6.

April 10. DUNGIVEN (IRELAND).—Alteration and extension of church, for the committee. Plans and specifications with Rev. Andrew Gibson, B.D., or Samuel Macartney, architect, Dungiven. Tenders with Patterson Boyle, secretary, by April 10.

April 10. NOTTINGHAM.—Erection of a Bulwell stone boundary wall; also structural alterations to cottages in Brewhouse Yard, and to buildings in yard adjoining Castle Works, Castle Boulevard, for the Corporation. Particulars on application to F. W. Davies, water engineer, St. Peter's Church Side, Nottingham. Specification and form of tender, at the engineer's office on deposit of £1 1s. Tenders by April 10, to J. A. H. Green, town clerk, Guildhall, Nottingham.

April 15. BETHNAL GREEN.—Erection of municipal buildings in Cambridge Road, Bethnal Green, for the corporation. Particulars of the borough engineer and surveyor, E. E. Finch, town hall, Bethnal Green, N.E., on deposit of £2 2s. Tenders by noon on April 15 to R. Voss, town clerk, town hall, Bethnal Green.

April 16. BEXHILL.—Construction of a colonnade, shelters, and bandstand, for the corporation. Particulars of the borough surveyor, George Ball, Assoc.M.Inst.C.E., town hall, upon deposit of £5. Tenders by April 16, to T. E. Rodgers, town clerk, town hall, Bexhill.

ENGINEERING.

March 29. COWES, I.W.—Construction of a division wall and covering in part of reservoir, in reinforced concrete (Hennebique system), for the U.D.C. Particulars of John W. Webster, engineer to the council, Cowes, I.W. Tenders by 4 p.m. on March 29, to H. C. Damant, clerk, High Street, Cowes, I.W.

March 29. ROSSEND.—Construction of the superstructure of Milnwood bridge over the main line near Mossend, for the directors of the Caledonian Railway Co. Drawings at the office of the company's engineer, Buchanan Street station, Glasgow, where copies of specification and schedule may be obtained on deposit of £2 2s. Tenders by March 29, to J. Blackburn, secretary, Caledonian Railway Company's offices, 302, Buchanan Street, Glasgow.

March 30. ORKNEY.—Construction of a new pier, 470ft. in length, at Whitehall, Stronsay, Orkney, for the Orkney Harbours Commissioners. Alternative offers for stone masonry or cement concrete. Particulars of D. J. Robertson, clerk, Orkney Harbours Commissioners, Kirkwall, to whom tenders are to be sent by March 30.

March 30. LONDON.—Construction of 215 foot run of embankment wall in Deptford Creek, in front of the Council tramway depot, for the L.C.C. Full particulars in the "London County Council Gazette" of March 22. Tenders by 11 a.m. on March 30, to G. L. Gomme, clerk L.C.C., County Hall, Spring Gardens, S.W.; £1 deposit.

March 30. NEW MILLS.—Supply and erection of a water-softening and filtering plant, capacity 6,000 gallons per hour, also erection of a sulphate plant at the gasworks, for the U.D.C. Particulars of the engineer, P. Lancashire, gasworks, New Mills. Tenders by March 30, to Joseph Pollitt, clerk, town hall, New Mills.

April 2. SHEFFIELD.—Widening Lady's Bridge, The Wicker, Sheffield, by means of steel decking, girders, and cast-iron columns supported on masonry foundations below water level, for the corporation. Particulars at the office of the city engineer, town hall, Sheffield, on deposit of 10s. Tenders, at the city engineer's office, by 10 a.m. on April 2. Fair wages clause.

April 10. BURTON JOYCE, near NOTTINGHAM.—Sinking a well and three boreholes at Burton Joyce, for the Corporation. Particulars on application to F. W. Davies, water engineer, St. Peter's Church Side, Nottingham. Specification and form of tender at the engineer's office on deposit of one guinea. Tenders by April 10, to J. A. H. Green, town clerk, Guildhall, Nottingham.

IRON AND STEEL.

March 25. LYTHAM.—Providing and fixing iron railings, and constructing a concrete kerb on the promenade, for the U.D.C. Particulars at the office of the surveyor to the council. Tenders to the clerk to the council before noon on March 25.

March 29. SWINDON.—Supplying, delivering, fixing and painting about 160 yards run of wrought iron unclimbable fencing with gates, for the corporation. Particulars of H. J. Hamp, borough surveyor, town hall, Swindon. Tenders by March 29, to Robt. Hilton, town clerk, town hall, Swindon.

March 30. EPSOM.—1, Supplying about 1,960 yards of 3in. cast-iron water pipes with specials; 2, excavating trenches, carting, and laying pipes, fixing hydrants, etc., for the R.D.C. Particulars of F. A. Pratley, surveyor to the council, Waterloo Road, Epsom. Tenders by March 30, to Arthur R. Cotton, clerk, Waterloo Road, Epsom.

March 30. LONDON (for Madras).—Supplying (1) 40,000 transverse steel sleepers and keys; (2) 1,516 tons (approx.) structural steelwork, etc.; (3) metals (miscellaneous); for the board of directors of the Madras and Southern Mahratte Railway Co., Ltd. Specifications at the office of the company, on payment of £1 1s. (not returnable). Tenders by noon on March 30 to H. Bonham-Carter, secretary, 91, York Street, Westminster, S.W.

March 30. LONDON (for India).—Supplying girder bridges, for the Bombay, Baroda, and Central India Railway. Specification, on payment of 21s. (not returnable). Tenders by March 30, to C. Crommelin, secretary, offices, Gloucester House, 2, 3, and 4, Bishopsgate Street Without, London, E.C.

March 31. MANCHESTER.—Supplying about 658 tons of cast-iron water pipes, 3, 4, 5, 6, and 7 inches diameter, with about 100 tons of special castings, for the corporation. Specifications, etc., of the secretary, waterworks offices, town hall, Manchester, on deposit of 10s. Tenders by March 31, to Wm. Henry Talbot, town clerk, town hall, Manchester.

March 31. MANCHESTER.—Supplying cast-iron hydraulic (high-pressure) pipes, 1½, 2, 3, 4, 5, and 6 inches diameter, and special castings, during the year ending March 31, 1910, for the corporation. Particulars, the secretary, waterworks offices, town hall, Manchester, on deposit of 10s. Tenders by March 31, to Wm. Henry Talbot, town clerk, town hall, Manchester.

April 3. MANCHESTER.—Supply, delivery, and erection of a steel roof over the "B" retort house at the Rochdale Road gasworks, Manchester, for the corporation General conditions, etc., of C. Nickson, superintendent, gas department, town hall, Manchester, on deposit of £1 1s. Drawings and other information of J. G. Newbigging, M.Inst.C.E., Rochdale Road gas station. Tenders to the chairman of the gas committee, gas offices, town hall, Manchester, by noon, on April 3.

April 5. LOWER BROUGHTON.—Supply and fixing an emergency iron staircase at the Grecian Street Boys' School, Lower Broughton, for the corporation of Salford. Specification and drawing from the director of education, education office, Chapel Street, Salford. Tenders by noon on April 5, to L. C. Evans, town clerk, town hall, Salford.

April 7. GLASGOW.—Supplying relative designs for new ornamental wrought iron gates and railings, for the corporation. Cost of gates and relative works including painting and decorating must not exceed £500. Particulars of A. B. M'Donald, city engineer, 64, Cochrane Street. Offers, with relative designs, by 10 a.m., on April 7, to A. W. Myles, town clerk, City Chambers, Glasgow.

PAINTING.

March 26. SALISBURY.—Colouring and cleaning wards and other parts of the hospital for the committee of the Salisbury infirmary. Specification of M. Harding, High Street, Salisbury. Tenders to S. B. Smith, secretary, at the infirmary, by March 26.

March 26. CLONAKILTY (IRELAND).—Painting workhouse of the union, internally and externally, for the guardians. Tenders, containing names of two solvent sureties, by noon on March 26, to William Henry Spiller, clerk of union, from whom particulars may be obtained.

April 5. MARGATE.—External painting of Wingham pumping station and cottages in accordance with the specification by waterworks engineer, E. A. Borg, for the Corporation. Particulars at the engineer's office, 13, Grosvenor Place, Margate. Tenders by 1 p.m. on April 5, to Edward Brooke, town clerk, town clerk's office, 13, Grosvenor Place, Margate.

April 7. LEEDS.—Painting a portion of the public lamps during the ensuing year, for the corporation. Specification and form of tender from the superintendent, street lighting department, Springwell Street. Tenders by April 7, to Robert E. Fox, town clerk.

PLUMBING & SANITARY

March 25. MAIDSTONE.—Sanitary improvements at the Mereworth Council School for the Kent Education Committee. Particulars of the correspondent, Miss K. Morton, West Pavilion, Mereworth Castle, Maidstone, to whom tenders are to be sent by March 25. (See also "Building").

March 25. YEALMPTON, PLYMPTON ST. MARY.—Laying about 120 yards of 6in. glazed stoneware socket pipes and building manholes in the village of Yealmpton, for the U.D.C. Particulars from the council's engineer, F. A. Clark, 83, Old Town Street, Plymouth. Tenders by March 25, to John W. Bickle, clerk to the council, Temple Chambers, Westwell Street, Plymouth.

March 26. HULL.—Construction of sewer in Lister Street, for the corporation. Particulars of A. E. White, M.Inst.C.E., city engineer, town hall, Hull. Tenders addressed to the chairman of the works committee, at the town clerk's office, before noon on March 26.

March 30. KEIGHLEY.—Construction of brick outfall sewer, tanks, filters, and other works, for the Corporation. Tenders by 6 p.m. on March 30, to Walter Fowlds, A.M.I.C.E., borough engineer, town hall, Keighley, of whom particulars may be obtained on deposit of cheque £2.

April 3. RATHDANGAN, BALTINGLASS.—Erection of a pump at Rathdangan village, according to specification, for the R.D.C. Tenders by 11 a.m. on April 3, to J. Ralph Dagg, clerk to the council, Baltinglass workhouse. Security required.

April 3. WALLINGFORD (BERKS.).—Construction of about 450 yards of sewer in the Wantage Road, Didcot, with manholes, ventilators, and hydrant, for the R.D.C. Particulars of the clerk, 7, St. Martin's Street, Wallingford, Berks, upon deposit of £1 1s. Tenders by April 3, to G. F. Slade, clerk to the R.D.C.

April 14. CLARE.—Construction of a new sewer, for the R.D.C. Particulars of G. E. Mitchell, inspector, Ashen Road, Clare, Suffolk, on deposit of 5s. Tenders by April 14, to S. L. Bigmore, clerk, 2, Wratting Road, Haverhill.

April 22. ILKESTON.—Providing, laying and jointing about 500 yards of duplicate 18in. cast-iron outfall sewer, with inspection chambers; also construction of liquefying tanks, bacteria beds, motor-houses, sludge lagoons, etc., for the corporation. Particulars at the offices of the engineers, Willcox and Raikes, of 63, Temple Row, Birmingham, on deposit of £5 5s. Tenders by noon on April 22, to Wright Lissett, town clerk, town hall, Ilkeston.

ROADS AND CARTAGE.

March 25. THORNTON.—Making up Butt's Road, for the U.D.C. Particulars from H. Fenton, surveyor, council offices, Thornton, upon deposit of £1. Tenders by March 25, to Richard Bowman, clerk to the council, council offices, Thornton-le-Fylde.

March 27. POCKLINGTON.—Supplying best blue stone and slag for repairing roads throughout the district for the R.D.C. Particulars of Thos. Robson, clerk, Pocklington, to whom tenders are to be sent by March 27.

March 27. HORSHAM.—Supplying about 3,500 cubic yards of flints, and about 3,800 yards of granite, or other approved stone; also carting, for the R.D.C. Apply to the surveyor, Wm. Dengate, 58, Park Street, Horsham. Tenders by March 27, to A. C. Coole, clerk, 9, Carfax, Horsham.

March 27. STOCKTON-ON-TEES.—Leading stone, and other materials for the roads in the district for the year ending March 31, 1910, for the R.D.C. Particulars on application to W. Heslop, highway surveyor, Station Road, Norton-on-Tees. Tenders by March 27, to T. H. Faber, clerk, Stockton-on-Tees.

March 27. GATESHEAD.—Supplying the following materials for one year, for the corporation: Whinstone macadam, granite macadam, whin setts, whin curb, whin channel, whin wheelers, limestone macadam, freestone curb and flags, metal gullies, manhole covers, etc., shovels, picks, scavenging brooms, lime and cement. Specifications, etc., of N. P. Pattinson, borough surveyor, town hall. Tenders by noon, on March 27, to W. Swinburne, town clerk.

March 29. KING'S LYNN.—Supplying road materials, to March 31, 1910, for the corporation. Particulars of J. H. Webb, borough surveyor, town hall, King's Lynn, to whom tenders by March 29.

March 30. LYDD.—Supply and delivery for the Corporation at Lydd railway station of:—400 tons 1½in. Rhenish Columnar basalt, 20 tons 1¼in. Rhenish Columnar basalt, 10 tons ⅜in. chippings basalt. Tenders by March 30, to Thomas Kettle, borough surveyor, Lydd.

March 30. GATESHEAD.—Execution of cement path work on various roads and streets, for one year, for the corporation. Particulars of N. P. Pattinson, borough engineer, town hall, Gateshead. Tenders by 2 p.m. on March 30, to Wm. Swinburne, town clerk,

March 31. BARNET.—Making-up private street, for the U.D.C. All information of W. F. Wilkins, surveyor to the council, 40, High Street, Barnet. Tenders by March 31, to H. W. Poole, clerk to the council, Barnet.

March 31. BURSLEM.—Making-up Parker Street, for the corporation. Plan and specification, etc., on deposit of £2 2s., with F. Bettany, borough engineer and surveyor. Tenders, to A. Ellis, town clerk, town hall, Burslem, by 5 p.m. on March 31.

March 31. NORMANTON.—Supplying stone and concrete flags, kerbs, channels, setts, granite, limestone, whinstone, and tar macadam, for the U.D.C., for 12 months commencing April 1. Tenders by 5 p.m., on March 31, to John W. Martin, clerk, council offices, Normanton, of whom particulars are to be obtained.

March 31. HUNTINGDON.—Supplying broken granite and iron slag, for the year ending March 31, 1910. Particulars on application to Herbert Leete, county surveyor, High Street, Huntingdon, to whom tenders are to be sent by 10 a.m. on March 31.

April 1. LONDON.—Supplying the following road materials, for the commissioners of H.M. Works and Public Buildings:—Guernsey or Alderney granite, flints, red pit sand, gravel, cockle shells, screened Thames sand, and ¼in. pea gravel. Forms of tenders at H.M. Office of Works, Storey's Gate, S.W. Tenders before noon on April 1, to the secretary.

April 3. STRETFORD.—Paving with setts granited rock, asphalt, etc., six streets and passages, for the U.D.C. Particulars of Ernest Worrall, the council's surveyor, on deposit of £2 2s. (cheque). Tenders to the chairman of highways, council offices, Old Trafford, by April 3.

April 3. WATH-UPON-DEARNE.—Supplying and delivering during year ending March 31, 1910, for the U.D.C.:—1, granite and Whinstone macadam; 2, machine-broken furnace slag; 3, tarred slag; 4, limestone screenings; 5, slag screenings. Particulars of H. C. Poole, surveyor, town hall, Wath-on-Dearne, to whom tenders are to be sent by April 3.

April 3. DUNMOW.—Supplying 1,025 tons broken granite, 1½in. gauge, to be delivered free, during May, June, and July, for the R.D.C. 670 tons at Dunmow and Takeley railway stations, 300 tons at Felstead railway station, 50 tons at Elsenham railway station. Tenders, with samples, by March 3, to Alfred E. Floyd, clerk, Dunmow, Essex.

April 3. MIDDLETON.—Supplying setts, flags, sanitary tubes, granite, macadam, cast-iron manholes and street grids, waste water closets, and lime, during the year ending March 31, 1910, for the Corporation. Particulars of W. Welburn, borough surveyor, town hall, Middleton. Tenders, addressed to the chairman of the surveyor's committee, by April 3, to Frederick Entwistle, town clerk, town hall, Middleton.

April 6. MALDON.—Supply and delivery of:— 1, granite; 2, slag; 3, Kentish flints; 4, picked stones; 5, gravel; for the R.D.C. Particulars of E. J. Ennals, surveyor, 6, Market Hill, Maldon, Essex, where tenders must be delivered by April 6.

April 6. CROWMARSH.—Supply of broken granite, flints, and gravel, for repair of highways for year ending March 31, 1910; also cartage and hire of steam roller, with plant, at per day, for the R.D.C. Particulars from Jos. Preston, surveyor to the council, Benson, Wallingford. Tenders by April 6, to G. F. Slade (solicitor), clerk, 7, St. Martin's Street, Wallingford, Berks.

April 10. BURY ST. EDMUNDS.—Supplying granite during year ending March 31, 1910, for the West Suffolk C.C. Tenders by April 10, to A. Ainsworth Hunt, county surveyor, Shire Hall, Bury St. Edmund's.

MISCELLANEOUS.

March 27. LANCASTER.—Replanking and providing iron standards, etc., at Keer Bridge, in Warton and Carnforth, for the R.D.C. Particulars on application to W. Dixon, surveyor, 5, Dalton Square, Lancaster. Tenders by 10 a.m. on March 27, to William D. Ball, clerk to the council, 5, Dalton Square, Lancaster.

March 29. PORTSMOUTH.—Altering doors and frames in the town hall and supplying and fixing panic bolts, for the Corporation. Particulars at the borough engineer's office at the town hall. Tenders by 10 a.m. on March 29 to Alexander Hellard, town clerk, town hall, Portsmouth; fair wages clause.

March 29. EDINBURGH.—Supplying the following material for the electricity supply department for the year from May 16:—Bitumen, lead-covered paper insulated copper cables, arc lamp carbons, arc lamp globes, house service fuse boxes, electricity meters, cast-iron pipes and pavement boxes. Particulars at the engineer's office, Dewar Place, Edinburgh, on deposit of 10s. Tenders by March 29, to the town clerk, City Chambers, Edinburgh.

THE

Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester
Telegraph: "Federated, Manche

Appointments Wanted.

The charge for Advertisements under this heading 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE architect prepares designs, perspectives, working drawings, etc., on moderate terms.—W., 6, King's Road, Kingston-on-Thames. 4918

ADVERTISER (28), seeks re-engagement, ten years' thorough practical knowledge of building, estate management, and repairs, etc.; experienced in preparing plans and estimates, including quantities, for new works; highest refs. — Y., 86, Coniston Road, Muswell Hill, N. 4805

APPOINTMENT as Improver (19), prob. R.I.B.A., just completing three years' articles with an architect and surveyor; small salary to commence; highly recommended.—H. Cullerne, "Bridge House," Lugwardine, Hereford. 4911

ARCHITECT and Surveyor's Assistant, P.A.S.I. (22), working drawings, surveying and levelling, taking off, abstracting and billing quantities, drainage and sanitation; general office routine.—George A. Taylor, Aston Road, Wem, Salop. 4892

ARCHITECT'S Assistant desires engagement, finalist R.I.B.A.; design, details, specifications, 1st class honours, quantity surveying, honours (Part 1), building construction, artistic and practical; moderate salary.—Address Architect, 24, Brunswick Street, C.-on-M., Manchester. 4871

ARCHITECTURAL Draughtsman, thoroughly experienced in designing steel and ferro-concrete work, factory chimneys, retaining walls, foundations, overhead gantries, and all constructional work is open to assist or consult architects by correspondence.—Box 4827, Builders' Journal Office

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECTS, Builders, etc., draughtsman (19), used to general work, fill up time in office; good references.—F. J. Williams, c/o F. Cundall, Architect and Surveyor, 34, Parade, Leamington Spa. 4878

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. 4888

ARCHITECT'S Assistant (27), excellent draughtsman and colourist; contract drawings, specifications, details, design, perspective, surveys, etc.; travelling studentship winner; highest refs.—Box 4902, Builders' Journal Office.

ARCHITECT'S Assistant (23) desires engagement, town or country; excellent draughtsman; good general experience; first-class references.—Box 4937, Builders' Journal Office.

ARCHITECT and Surveyor's Assistant (21), seeks re-engagement; 5 years' experience in church and domestic work in larger provincial office; good draughtsman and colourist.—Box 4823, Builders' Journal Office.

ARCHITECT and Surveyor's junior assistant (19), desires engagement; surveying, levelling, etc.; office routine; salary 15s.—Box 4930, Builders' Journal Office.

ARCHITECT'S Assistant (25), R.I.B.A. exam., nine years' thorough practical experience, design, working drawings, details, specifications, estimating, quantities, levelling, perspectives, etc.; sal. moderate.—Apply, Box 4900, Builders' Journal Office.

ARCHITECT'S fully qualified Assistant and Quantity Surveyor, energetic and experienced, desires immediate engagement, temporary or otherwise; competition expert; highest references; salary moderate.—W. B., 156, Warwick Road, Birmingham. 4935

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

ARCHITECT'S Junior Assistant, 5½ years' experience; disengaged; working and detail drawings, typewriting, knowledge of perspective; moderate salary.—W. L. Francis, 11, Middleton Road, Ilkley, Yorks. 4891

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, Builders' Journal Office.

ASSISTANT Surveyor seeks re-engagement; 9 years with City firm; highest testimonials; surveys, levels, estate management, etc.; shorthand if required; moderate salary.—K., 21, First Avenue, Manor Park. 4917

ASSISTANT, provincial experience, good planner and designer, domestic Renaissance, working drawings, details, surveying, competitions; excellent draughtsman, A.R.I.B.A. at one sitting; age 27.—Box No. 4928, Builders' Journal Office.

BUILDERS' Assistant desires situation; thorough knowledge plans, specifications, quantities, measuring; not afraid of work; salary not so much an object as permanent situation; 21; 5 years' experience.—Box 4839, Builders' Journal Office.

BUILDER and contractor's estimating and managing clerk seeks berth, exceptionally good all-round qualifications, acquired by sound London and provincial experience, and a reliable and successful estimator, including sewerage and kindred works; good references.—T. C., 3, Hampton Terrace, Brighton. 4933

BUILDER'S or Architect's Junior Assistant (18), good tracer, well up in prime cost, and general office work; excellent references; three years' experience. — J. W., 164, Wellesley Road, Ilford, Essex. 4833

BUILDER'S Clerk and Assistant (20) requires situation; good draughtsman and colourist, certificates advanced construction, bookkeeping, typewriting and general routine; excellent references. —C. E., 59, Rosebery Gardens, Harringay, N. 4904

BUILDER'S clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N. 4883

BUILDING Exhibition.—Young architect is prepared to assist exhibitors at the above; can reach same daily; terms low.—Box 4925, Builders' Journal Office.

BUILDING Trades' Exhibition, 1909.—Gentleman, with wide architectural experience, offers services to provincial or other exhibitors as representative at their stand; for terms apply Box 4931, Builders' Journal Office.

CARPENTER and Joiner desires sit.; bench, building or estate, or other suitable capacity; experienced; good refs.; age 30.—R. H. W., 24, Thorncroft Road, Fratton, Portsmouth. 4908

CLERK of Works, desires re-engagement, possessing first-class testimonials for ferro-concrete construction, also from Metropolitan Borough Councils, eminent architects and engineers; age 45.—Box 4922, Builders' Journal Office.

DRAUGHTSMAN (junior), 5 years' experience in structural engineers, good knowledge of constructional and ornamental work, details, quantities and estimating; shop experience.—M.D., 74, Bartholomew Road, London, N.W. 4884

DRAUGHTSMAN, neat, quick tracer, working drawings from rough sketches, good colourist; shorthand, typing, etc.; about 12 years' varied experience; terms moderate.—Box No. 4889, Builders' Journal Office.

ESTATE Owners.—Bricklayer, all-round, stonewaller, and general repairs; abstainer; good references; moderate wage for permanency.—Quinton, 12, Holland Road, Aston, Birmingham. 4802

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, Builders' Journal Office.

FOREMAN Painter (working) seeks re-engagement); experienced in all class work in building trade, as for general alterations, etc.; good supervisor, and reliable; either town or country; abstainer.—X. Y. Z., 8, Barton Street, Westminster. 4807

GENTLEMAN, with office in Glasgow, splendid connection among architects, builders, etc., is open to represent one or two good firms; first-class references given.—Box 4893, Builders' Journal Office.

GENERAL Foreman seeks re-engagement; alterations or new, practical experience in all branches; carpenter and joiner; good references; age 36; moderate wages.—Caplen, 3, Victoria Mansion, Edgware Road, Paddington, W. 4779

GENERAL Foreman seeks re-engagement, thoroughly practical and reliable; new or alterations; carpenter and joiner; life abstainer; first-class references.—Foreman, 3, Hawbridge Road, Leytonstone. 4787

GENERAL or builder's foreman, energetic, reliable, good timekeeper, trade bricklayer; age 32. Good refs.—G. C., 44, Richmond Park Road, Kingston-on-Thames. 4863

JUNIOR Assistant desires situation, home or abroad; good practical knowledge of construction and details; competent draughtsman and colourist, working drawings, measuring and supervising, surveying and levelling; moderate salary.—Box 4613, Builders' Journal Office.

MACHINIST seeks situation; spindle fourcutter, etc.; married, age 32; total abstainer and good timekeeper.—Machinist, 46, Priory Street, Tonbridge, Kent. 4874

PAINTING, paperhanging, distempering, graining wanted, piecework, new work at greatly reduced prices; specimen showing architects' and surveyors' testimonials for quality and cheapness.—Galton, 6, Parolles Road, Upper Holloway, N. 4861

PLASTERER, good jobbing bricklayer, roofs, fire work, stoves, tiling, etc., etc., generally useful, good reference, moderate wages, non-union.—A. Trigg, 117, St. John's Hill, Clapham Junction, S.W. 4856

REINFORCED CONCRETE.—Details, drawings, calculations, and assistance generally, rendered to architects, builders, etc., by a specialist of large experience; terms moderate.—Box 4887, Builders' Journal Office.

SURVEYOR'S Assistant seeks re-engagement, 9 years with City firm; highest references; surveys; levels, estate management, etc.; shorthand and typewriting, if necessary. — J. P. K., 21, First Avenue, Manor Park, Essex. 4873

TO Estate Owners, builder, experience, in all trades, desires position as manager (working or otherwise); plans prepared, quantities, setting out, accounts and supervision; abstainer; country preferred.—Box 4806, Builders' Journal Office.

WORKING shop foreman seeks re-engagement, thoroughly practical and reliable carpenter and joiner; abstainer; 7 years' ref.; age 38; wages moderate.—C. M., 16, Margett's Road, Kempston, Bedford. 4932

WORKING Foreman wants job, capable, energetic, thoroughly understands plans and setting out of buildings, etc., and taking full control of all branches; twenty years' experience; age 35; just finished job; trade, carpenter and joiner; not afraid of work; wages required, £3 per week. —Apply Box 4906, Builders' Journal Office.

YOUNG Architect is prepared to assist others, at his own office or otherwise; mod. terms.—Box 4926, Builders' Journal Office.

Appointments Vacant.

ARCHITECTURAL Editor, with wide experience in general building construction and literary style, required to take up editing of architectural textbooks before same are sent to press.—Apply by letter, giving full particulars of qualifications and salary required, to "R." c/o Paul E. Derrick, 34, Norfolk Street, Strand. 4929

ARTICLED Pupil—Reinforced Concrete. Required a young gentleman as articled pupil in reinforced concrete specialist's office, one with a knowledge of elementary applied mechanics, and mathematics and a taste for theory of construction and design preferred; an excellent opportunity for one willing to learn and understudy chief engineer.—Write, R. C., c/o Hastings Bros., Ltd., King's Chambers, Portugal Street, Kingsway, W.C. 4907

ARTICLED PUPIL.—Vacancy for same in old established West End firm of architects and surveyors; moderate premium; small progressive salary to suitable youth.—Box No. 4890, Builders' Journal Office.

ESTATE clerk of works wanted, used to building and general estate work; highest references required; state wages.—Apply, Clare, Estate Office, Rothley, Leicestershire. 4924

MESSRS. Oliver and Dodgshun beg to thank the various applicants in response to their advertisement of 10th inst., and to say that the vacancy has been filled.

WANTED, Joiners' Foreman, for London shop of 20 men; able to estimate and work accurately to cost; used to machinery.—Box 4936, Builders' Journal Office.

March 31, 1909. Volume 29. No. 738.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: The Beauties of Bath; An English Chair of Civic Design; Lovely in their Lives, 265; The Brutal Truth about Art - 266
The A.A. Play - - - - - - - - - 266
A Lesson from the Past. By J. A. Marshall - 266
London County Council General Powers Bill - 266
House at Berkhamsted - - - - - 269
Notes on Competitions - - - - - - - 270
Ideals in Building: False and True - - - 270
Correspondence: The Fair Wages Resolution - 270
Law Case: Ferro-Concrete Piles, Patent Rights Appeal - - - - - - - - - 270
The Liverpool Chair of Civic Design: Mr. S. D. Adshead Appointed - - - - - - - 271
In Parliament. By our Gallery Representative 271
New Municipal Works - - - - - - 272
Our Plate - - - - - - - - - - 272

CONCRETE AND STEEL SECTION.

The Concrete Institute - - - - - - - 273
Contractor and Sub-contractor - - - - 275
Concrete and Steel Construction at the Selfridge Stores. By S. Bylander - - - 276
A Huge Testing Machine - - - - - 281
A Theatre in Reinforced Concrete - - - 281
Standard Specification for Ferro-Concrete - 282
Reinforced Concrete Systems: The Considère System - - - - - - - - - 283
A New Test for Concrete. By J. S. Owen, B.A., M.D., A.M.Inst.C.E. - - - - 284
Earthquake-proof Buildings - - - - - 284
Imported Granite and Joinery - - - - 284
Federation News - - - - - - - - 285
Coming Events - - - - - - - - 286
Insurance - - - - - - - - - - 286
Tenders - - - - - - - - - vi., viii.
Complete List of Contracts Open - xxvii.-xxix.

ILLUSTRATIONS.

The Architectural Association at Work: Sketches by our Special Artist at the Reading of Mr. J. A. Marshall's Paper - 267
House at Berkhamsted. Ernest G. Theakston, Architect - - - - - - - - - 269
Mr. Stanley D. Adshead, F.R.I.B.A., Associate Professor of Civic Design at the University of Liverpool - - - - - - - 271
Y.M.C.A. Building, Merthyr Tydfil. Ivor Jones and Percy Thomas, Architects (see also Centre Plate) - - - - - - - 272
The Selfridge Stores - - 276, 277, 278, 279, 280
A Giant Testing Machine - - - - - 281
The Majestic Theatre Building, Los Angeles - - - - - - - - 281, 282
The Considère System of Reinforced Concrete 283

The Beauties of Bath. Mr. Ernest George, Mr. T. G. Jackson, and Mr. Mervyn Macartney, have joined in the protest against the proposal to demolish a portion of Bath Street, Bath, in order to make room for a modern hotel. These gentlemen are anxious to preserve a spot which, as Mr. George says, "has historic associations and is pleasant of aspect. . . Bath Street is part of a scheme laid out with design and dignity in Georgian days, including the Baths and the Pump-room, with their colonnaded spaces and approaches. We have few such examples of studied architectural treatment in our cities." He adds that, "It is sad if, in this twentieth century, our ideals do not lead us to anything higher than the destruction of that which was thoughtfully and admirably done by our forefathers." Prebendary Boyd, the Rector of Bath, is energetically opposing the scheme, as he too is anxious to prevent the unnecessary destruction of a characteristic example of the Georgian architecture of Bath; and he supports his case with the very just claim that, besides Bath, there are but few places that can show one prevailing architecture of merit, and that therefore "it would be a thousand pities for a portion of it to be destroyed." On the other hand, a local architect protests against the protesters, and deprecates their efforts to "preserve in its present dilapidated and jerry-built entirety the so-called antiquarian, historical, and architectural gem." One of the curiosities of the controversy is a letter from a correspondent who opposes the demolition on purely utilitarian grounds. "Scientists have proved beyond a doubt," he writes, "that the bacilli of virulent diseases remain practically for ever in the masonry of buildings, and that it is very injurious to the community at large to disturb such. It is with no alarmist motives that I urge the advisability of letting sleeping dogs lie, especially when they are bacilli, but—." This gentleman's argument need not be pressed to its remorseless conclusion. A general recognition of "the advisability of letting sleeping dogs lie, especially when they are bacilli," would rob the Society for the Preservation of Ancient Buildings of its right of being, and the "housebreaker" of his devastating occupation. But, seriously, much as we are inclined to distrust the outcry of "Vandalism" that is certain to arise upon the slightest pretext, we are in this instance disposed to sympathise — not with the canine bacilli non-alarmist, nor with the sentimentalists who attach great weight to the detail that Jane Austen made one of her characters buy ribbons in Bath Street, but—with the architectonic point of view adopted by the President of the R.I.B.A. The work destined to destruction may possibly in itself be invested with but little of interest or of beauty; but it happens to form an integral part of a general scheme, which, we gather, would be rendered lamentably imperfect by the obliteration of one of its characteristic features. This seems to us to be a reasonable ground for protest.

An English Chair of Civic Design. Town-planning may very conceivably become the most important movement in the history of architecture, and Liverpool is to be congratulated on its good fortune in being placed in a pioneer position. As we stated in our issue of December 9th, 1908, Mr. W. H. Lever, M.P., made to the University of Liverpool a characteristically generous offer. He undertook to provide annually, for three years, a sum of not less than £500, and, subject to the needs of the case, of not more than £1,000, to be expended on instruction and research as to methods in town planning and architectural landscape, as well as a capital sum of £500 to be devoted to research. The offer was, of course, gladly accepted. The administration of this trust will be watched with keen interest. It was suggested that, at the outset, a large proportion of the available income might be judiciously spent in organising a commission of investigation, which would visit and examine those places at home and abroad whose essays in town-planning are worth studying, and would afterwards issue reports embodying the experience thus obtained. This part of the scheme is yet to mature. In the meantime, the University of Liverpool, thanks to Mr. Lever's beneficence and enthusiasm, has established the first English Chair of Civic Design and Landscape Architecture, and it is announced that the Council of the University, at a meeting held on March 23rd, appointed Mr. Stanley Davenport Adshead, F.R.I.B.A., as Associate Professor of Civic Design. The School of Architecture was founded in 1881 by the citizens of Liverpool to commemorate the name of William Roscoe, and the Roscoe Professor of Architecture, Mr. Charles H. Reilly, M.A., A.R.I.B.A., will have in Mr. Adshead a coadjutor who, besides being a close student of town planning, is an extremely accomplished draughtsman. Altogether, Liverpool may well be envied its extraordinary opportunities of taking and keeping the lead in the orderly and systematic study of the principles and practice relating to what is likely to be the most momentous practical development that the profession has yet seen. This is a tangible beginning to great issues; and like the immortal dreamer of Elstow, we "wonder whereto this thing may grow."

Lovely in Their Lives. By a rather remarkable coincidence, three recent lectures before architectural societies have been mainly biographical. Mr. James Williams, in his lecture to the Architectural Association—an abstract was printed in last week's issue—gave a sympathetic account of the life and work of George Devey, whose sterling character and rare personal charm were perhaps of more striking interest than his work executed at a time that was unpropitious for the artistic side of architecture, but nevertheless better than that of the average "Early Victorian." Mr. A. Herbert has offered to the Leicester and Leicestershire Society of Architects an appreciation of the drawings and executed works of F. W. Ordish (born 1821, died 1885), who was president of that Society from 1876 to 1878, was associated with Pugin, had an unusual diversity of gifts, and was a particularly brilliant draughtsman. Then, thirdly, Mr. Butler Wilson described to students of the Leeds School of Art the career of Cuthbert Brodrick, the architect of the Leeds Town Hall, which he designed at the age of twenty-nine, and which was destined to be his most notable achievement. Mr. Butler Wilson claims that this building—Roman Renaissance of the Corinthian Order—remains almost unsurpassed, both in size and treatment, as a provincial hall; it has an area of 869,000 cubic feet, as compared with the 504,000 cubic feet in the Guildhall of London. Brodrick's fame spread to London, and he was one of the six British architects selected by the Government to submit designs in competition for the enlargement or entire re-building of the National Gallery. He designed also several public buildings in Leeds, including the Corn Exchange. Another of his works is the Hull Town Hall. He was commissioned to design a new Custom-house for Bombay, which was to cost £270,000, but the project was abandoned, Brodrick receiving, however, £3,000 for his drawings. Brodrick lived and practised for a time in Paris, and was within the French lines during the stirring times of the siege and Commune. He died at St. Martin's, Jersey, on March 2nd, 1905 —not in poverty, as was declared in a mendacious rumour, which saw his grey hairs brought down in sorrow to the position of a shoeblack!—but in such comfort as a balance of £11,000 at one's bankers may be held to imply. We must confess to a liking for these occasional excursions into the delightful domain of biography; for, while they must necessarily be "mainly about people," they imply a good deal of professional interest, conveyed in a particularly agreeable manner; and matter in this palatable form is perhaps more certain of assimilation than that which is administered with more didactic method and intention.

The Brutal Truth about Art.

The painter of pictures must reconsider his position. It is some considerable time since he made the painful discovery of a growing indisposition to purchase his products. He is now being told that if he had been less unworldly he would have discovered for himself the reasons for the decline. He has been informed, in the leading columns of the "Times," that the facile representation of the beauties of Nature which can be more satisfactorily realised "by looking out of windows" has become superfluous in consequence of the growth of modern taste, and that the easel picture is at best but dubiously decorative. The painter was therefore advised to adapt his skill to the changed conditions—to become a decorator. "Truth" states the case still more bluntly: "The painter of to-day must come off his perch. It is mere folly to sit in a corner sulking or bewailing his fate because people no longer live in rooms with hideous wallpapers which require covering with worse paintings. Let him fall into the general scheme of things and regard himself humbly as a house decorator." It is doubtless the fact that, as our contemporary contends, "The revival of domestic architecture, which includes interior decoration after the fashion of the seventeenth or eighteenth centuries, when no one dreamed of using pictures as the sole means of adorning the walls of a room," is responsible for the change. Architecture, having resumed her position as "the Mistress Art," is re-asserting herself, and is becoming as imperative as she was wont to be in the days when the decoration of churches, palaces, and public buildings produced some of the finest paintings that the world has seen. Nor is there any lack of modern examples. The decorations at the Royal Exchange, and still more strikingly, Mr. Abbey's panels for the Boston (U.S.A.) Public Library, show how the painter may dignify rather than degrade his art by making it decorative and subordinate.

THE A.A. PLAY.

The A.A. play on "The Rise and Fall of Architecture" was presented, with all possible success, on Wednesday (ladies' night), and Friday (smoker) of last week, at The King's Theatre, Covent Garden. In our next issue we hope to give further particulars and some sketches. Meanwhile, we desire to congratulate all concerned upon their excellent work. The A.A. Musical Society provided the orchestra, under the bâton of the composer, Mr. C. A. Kelly.

A LESSON FROM THE PAST.

Abstract of part of a paper read by Mr. J. A. Marshall before the Architectural Association on March 19th.

The first part of Mr. Marshall's paper consisted of a somewhat satirical retrospective review, after the method of "Looking Backward," of the architectural (and engineering) practice of the period described as "The beginning of the Twentieth Century of our era," when "Science, that most progressive department of man's activity, was in direct conflict with art, as that term had long been understood; like the canker in the rose, its insidious encroachments could not be suppressed; new systems of construction—not amenable to any style of the past—had arisen almost without warning, and the older methods were becoming as obsolete as the sedan chair of Queen Anne or the 'Fighting Téméraire' of Trafalgar." In the second part of his paper, Mr. Marshall said:—

Phases of Historical Architecture.

It is well stated in your curriculum that "the growth and development of the various phases of historical architecture have arisen mainly through constructional and actual necessities, modified by varying social conditions and the material available."

In following this development you will find that, though historical architecture has its phases of incipiency, maturity, and decadence, yet throughout the ages there was a distinct and uninterrupted advance in the science of building, an advance that was as little affected or impeded by ornamental art as is the tidal ocean by the undulations on its surface; and your attention cannot fail to be arrested by those brilliant achievements in constructive skill that stand conspicuous and unapproachable amid the ever-widening stream of architectural activity.

A Sudden Expansion.

Thus, in the fifth century, when the religious zeal of the Emperor Justinian urged him to build the finest church in the world, the result was a sudden expansion—almost to the bursting point—of the crude principles of pendentive vaulting. In the twelfth century the constructive expedients resorted to by our own Wren were dimly yet surely foreshadowed in the Baptistry at Pisa. In the fifteenth century the citizens of Florence, in their religious pride, surmounted their cathedral and the whole city with the largest dome in the world, built on a principle for which there was absolutely no precedent beyond the obscure crudity of the Roman Pantheon. A century later the Roman pontiffs aimed at something still more daring, and at St. Peter's the massiveness of the Florentime dome is sustained by the buoyancy of the Byzantine. And finally, in the seventeenth century, Sir Christopher Wren, for the citizens of London, produced the greatest artistic effects by a novel and skilful disposition of the slenderest materials.

If you turn to

The Gothic Period

you will find the continuity of the advance perhaps still more marked. During the early stages the statical conditions are abundantly maintained in the sturdy proportions of the design. Later, this timidity gives place to a more economic adjustment of the various parts on a grander scale, until all redundant material is eliminated, and the structure may be said to present a diagrammatic illustration in stone of the strains and stresses. Finally, this open sincerity is succeeded by an artificial display of the mason's craft, as ingenious as it is splendid.

Instances of these phases are well known to you. The historian and the archæologist have very kindly traced for us their evolution. Due chiefly to varying social conditions, the mutation was generally a matter of slow time, and there was nothing startling about it; but when a great calamity occurred —like the plague of the fourteenth century, which swept away more than one-half of the four millions who then formed the population of England—the thread of tradition was somewhat weakened, and the succeeding outburst of the mason's skill at Gloucester may, we are told, be regarded as something remarkable. The gossamer-like veiling that was then spread over the venerable features of the Norman choir, and projected right through the apse, compels our admiration, and the audacious interference is condoned in view of the independent expression it ultimately assumed in the Lady Chapel beyond, and later in the chapels at Windsor, Cambridge, and Westminster.

The Decline of Organic Architecture.

The decline of what has been termed "organic" architecture was attended by the development of a style of which a great deal is seen and heard at the present time. Precise and scholarly, with a close affinity to the articulation of antique art, it is devoid of virility, and rises superior to "constructional and actual necessities." With such attributes, and with details that can readily be expressed on paper, when they are not tortured into some wild freak, it is well within the capabilities of the modern practitioner and the modern workman; therefore it is not surprising that the beguiling influence of its later phases should now be almost universal.

Between Truth and Falsehood.

The German poet Goethe, whose mind, as you know, was pre-eminently receptive and discriminative, visited Vicenza 120 years ago. He there saw the finest buildings by the last great master of the Italian Renaissance. Of these he says:—"When once one stands in the presence of these works one immediately perceives their great value, for they are calculated to fill the eye with their actual greatness and massiveness, and to satisfy the mind by the beautiful harmony of their dimensions. Therefore I say of Palladio, he was a man really and intrinsically great, whose greatness was outwardly manifested. The chief difficulty with which this man—like all modern architects—had to struggle was the suitable application of the orders of columns to buildings for domestic or public use, for there is always a contradiction in the combination of columns and walls." (An old-fashioned objection that we hear nothing of nowadays.) "But with what success," Goethe proceeds, "has he not worked them up together! What an imposing effect has the aspect of his edifices; at the sight of them one almost forgets that he is attempting to reconcile us to a violation of the rules of his art. There is, indeed, something divine about his designs, which may be exactly compared to the creations of the great poet, who, out of truth and falsehood, elaborates something between both, and charms us with its borrowed existence." Again he says:—"The noble buildings which Palladio has erected are disfigured by the mean necessities of the people. The plans of most of them exceeded the means of those who undertook them, and these precious monuments of one lofty mind are but little adapted to all else around." At once a eulogy and condemnation.

The architect, you see, has now become a great personality. He builds for fame. The structure is his monument, the necessities of the people are ignored, and the Gothic town hall at Vicenza is henceforth buried in Palladio's "imposing" arcades.

"A Mathematician Named Wren."

About 100 years later a mathematician and astronomer named Christopher Wren was entrusted with the important task of rebuilding a great part of the City of London, after the fire that succeeded a calamity like that I have referred to of the fourteenth century.

It is not my purpose this evening to enlarge on the career of this great man, whose works are so well known to you, but merely to remind you of the fact that throughout his extensive practice he accepted the prevailing fashion of his day, and by a scientific adjustment of slender materials produced artistic

The Secretary reads the minutes
The President follows the reading of the paper
Mr Markham criticises
Mr Home defends the Engineers
Mr Marshall has some fears about our modern Architecture
Mr Horsley seconds the vote of thanks
The Fair Sex is well represented
Mr Edwin Gunn makes one or two points

THE ARCHITECTURAL ASSOCIATION AT WORK. SKETCHES BY OUR SPECIAL ARTIST AT THE READING OF MR. JOHN A. MARSHALL'S PAPER.

effects, stamped with individuality, yet charmingly varied to suit the exigencies of the site and the purposes of the building.

Wren's work presents a happy combination of that "truth and falsehood" so much appreciated by the German poet; but, partly owing to the fact that the English architect had seldom the leisure or the means to elaborate his designs beyond their natural development, it is the "truth" that is predominant. The germs of decadence—inseparable from a renascent style—are present, but the high-water mark of constructive skill had been reached, in combination with a definite and artistic expression.

Karnak to Westminster.

Thus, throughout the ages, say from the hall at Karnak to that at Westminster, and onwards to the eighteenth century, capacity to produce really interesting work, and an absence of that aptitude—so prevalent in the present day—to produce anything uninteresting seem to have been universal.

In this connexion it should be remembered that not only were the social conditions simpler than they are to-day, but the amount of architectural building was comparatively small; the materials used were the natural products of the country; the style of building was universal, and so was the system of workmanship.

The world has turned round many times since then, and to-day constructive skill has o'erreached the legitimate capabilities of honest material. We are invited to leave the path of architectural rectitude for the labyrinthic deceits of the persuasive engineer, and the intimacy between the two professions is now so cordial that one is apt to identify the Royal Institute of British Architects in Conduit Street with the Institute of Civil Engineers in Great George Street; indeed, the amalgamation is becoming more firmly consolidated, or cemented, every day, and we must, I suppose, regard it as the inevitable sequence to that steady advance in scientific construction that I have ventured to draw your attention to this evening. Is it not, I would ask, the result of those "actual necessities" that have arisen from ultra-commercialism and over-crowding? And so long as these remain the dominant features of our social conditions, the investigation of the engineer's anatomy will be retained as a subject on the pages of your curriculum.

No doubt this is very

Flattering to the Engineer.

He has nothing to lose by the interest you take in his work. His susceptibilities and instincts of form and beauty are not likely to be weakened or destroyed by the coalition. But what of yours? A gasometer may be more expansive, but is it more impressive than the Roman Pantheon? The Tower Bridge may be "a joy for ever," but is it really more beautiful than Waterloo Bridge?

Can any combination of engineering and pseudo-architecture rival the transparent candour of the Crystal Palace?

The works of Palladio and his compeers are indeed "divine," when compared with those parodic efforts, exalted to the skies, at the corners of our streets.

Utilitarian Rome.

You have been reminded of the utilitarian principles adopted by the builders of ancient Rome; how they threw aside the stone lintel and the wooden beam, to make use of their natural cement for concrete vaults, that covered the space, without thrust, like a metallic lid. Well, we have improved on the Romans in the manufacture of metallic lids and iron grids, but whether these are destined to survive the decay of our civilisation is a question that need not concern us; it is of greater importance to know that utilitarian architecture is not necessarily opposed to art.

The evidence of Roman greatness, as reflected in its architecture, is not to be sought for in the borrowed styles of Etruria or Greece, but in the native style of Imperial days, "when beauty was in a great measure incidental, and not specially aimed at by the designer." This spirit led naturally and easily to the development of a style which, at least, had that beauty which fitness is supposed to bring with it. The motto of the Roman architect was merely, "Build in truth."

No question arose in his mind as to whether "agreement in the principles of architectural design was possible," or whether "the system of architectural education was ideal." These were settled for him by the principles of authority and continuity. By the principle of authority we mean that recognised standard which enabled the profession as a whole to agree about the truth; and by the principle of continuity we mean the tradition by which this standard was carried on, and modified or expanded to suit the wants of the time.

Modern Complexity.

It is evident, after the lapse of hundreds of years, and after many attempts, we cannot successfully resume the thread of tradition; and even the principle of authority—according to our definition—seems beyond reach, in view of the complexities of modern requirements, and the duplicity that permeates our methods. What the future has in store it is impossible to say, and it is well we do not know. But if growth is the law of art, as of every kind of life, then undoubtedly there will come a time when architecture will be entirely free from those archæological entanglements that now retard its progress. As the Romans threw aside the lintel, so are we throwing aside the arch and time alone can show whether, like our great progenitors, we shall be able to evolve an unaffected yet expressive style of architecture. But if ever again there is to be a prevailing style—assuming this to be desirable—there must, of course, be a general compliance to established methods and rules. In the meantime the efforts of those whose ideal is a universal system of training for the architect in this country should be acknowledged with gratitude by all who desire the advancement of architecture. What that system should include and what it should reject are questions that could not have arisen a century or two ago; now they are both wide and deep, and cannot properly be discussed here. May I, therefore, hasten to remind you that your first duty as students of this association is unquestionable submission to the course of study laid down for you by your advisers?

You need not fear that

Obedience to Rules

and methods will check the artistic impulse or the latent genius, any more than it did in the past. Salutary restraint in art is not opposed to originality. As Ruskin has said, "A man who has the gift will take up any style going, that is the style of his day, and will work in that, and be great in that, and make everything that he does in it look as fresh as if every thought of it had just come down from heaven." When Ruskin wrote modern architecture was—to him—in a hopeless condition, and he was oppressed by the futility of preaching a doctrine of celestial excellence, in view of the want of that obedience, unity, and order without which the architecture of the past would have been impossible.

Your hope to-day, then, should be that these conditions will be re-established in your profession, on a basis favourable to that art with which sublimity and beauty are peculiarly associated. These it was that ensured the transcendency of Hellenic art, the majesty of Imperial Rome, the glowing wonders of Byzantium.

Discussion.

Mr. H. Home, in proposing a vote of thanks to Mr. Marshall, observed that, as a constructional engineer and an associate member of the Institution of Great George Street, he felt like Daniel stepping into the lions' den. He had had the opportunity of examining many of the world's most famous buildings, and it had struck him that the designers of early times had seized upon almost any material from which to construct their buildings. It was worth noting that at San Vitale, at Ravenna, the upper arches were constructed entirely of wine jars; and he believed all would admit that this was a most admirable building. If the builders of bygone times had known of reinforced concrete, they would have used it for dome construction, for which purpose it was well suited. In judging works of an engineering character, it should be borne in mind that they were constructed to last probably for centuries. In defence of the engineer, he felt it was only fair to say that he (the engineer) was not intended to construct palaces. Judge the engineer by his great monolithic works, and then they would be able to gauge his correct value. The paper, to him, was one of great interest, and he had much pleasure in proposing the vote of thanks.

Mr. Gerald C. Horsley seconded the vote of thanks, and, having gracefully alluded to Mr. Marshall's admirable work at Westminster Cathedral, said that in spite of the excellence of the paper, he found himself unable to agree with every opinion it expressed. Consultation with, and assistance from, the engineer should be, he believed, of the utmost value to the architect; and he did not see why the architect should not be able to design a fine building in reinforced concrete. Reinforced concrete, however, was a fearful material if any alterations were required to be made; and he believed that it could never be used in private houses or in buildings where there was any probability of future alteration. Mr. Marshall appeared to think that organic building came to an end about the fourteenth or fifteenth century, and that it was not till the time of Wren that they found a building based on scientific knowledge. They would gain a shrewd opinion of the mediæval constructors if they read the reports on old St. Paul's, Salisbury Cathedral, and Westminster Abbey.

Mr. J. H. Markham observed that it was of questionable profit to the architect to bemoan the fact that present conditions compelled him to design reinforced concrete. He had got to do it. And why the sombre prophesy that these buildings would not be standing fifty years hence? They had no opportunity of seeing how reinforced concrete buildings would stand the test of time. They were told, however, that they would improve with age, but he advised them not to rely greatly upon this statement.

Mr. Edwin Gunn observed that in some respects the functions of the architect and the engineer were almost identical. The aqueducts of Rome testified to this. The architect displayed a great fondness for hanging small pieces of stone on an engineering structure which, perhaps, was a thing of beauty considered by itself.

Mr. J. H. Elder-Duncan observed that the earliest application of the principles of reinforced concrete could be claimed by the Romans, who reinforced some of their vaults with bronze rods. The history of reinforced concrete in the modern sense might be said to date from 1823, when the first actual system was designed. In 1856 Wilkinson designed a floor in this material, and since then many patents had been registered in England and in France, in which latter country reinforced concrete was being widely used. It might be interesting to note that during the term of office of Mr. Somers Clark as supervising architect of St. Paul's Cathedral, it was deemed necessary to ascertain the condition of the chain girding the base of the dome, and that when the concrete was cut away, the chain was found to be as bright as when first put in.

The President having summed up the discussion, Mr. J. A. Marshall briefly replied.

A school for building trade apprentices has been started by the associated employers of the canton of Montmorency, France, at an initial outlay of about 50,000 francs, while the expense of maintenance is expected to reach from 12,000 to 15,000 francs a year.

LONDON COUNTY COUNCIL GENERAL POWERS BILL.

Another debate took place in the House of Commons last Thursday night on the London County Council General Powers Bill, when Sir F. Banbury moved that it be an instruction to the Select Committee on the Bill to omit sub-section 32 of clause 30. The clause contains provisions with respect to buildings of iron and steel skeleton construction. The sub-section which the member for the City of London wished to omit reads: "Any person dissatisfied with any requirement or decision of the district surveyor under this section may appeal to the Council, whose determination shall be final." The arguments covered a good deal of the ground traversed a fortnight ago, when the Bill was read a second time. The mover of the instruction contended that the surveyor was the servant of the County Council, to whom the appeal would be taken. The County Council's requirements with regard to reinforced concrete would be enforced by the surveyor, and the unfortunate builder or owner could only appeal to the surveyor's employer. He condemned artificial restrictions upon the development of reinforced concrete. The Committee could establish an appeal court if it liked upon the lines of the London Building Act of 1894, viz., three members nominated by the Secretary of State, the Royal Institute of British Architects, and the Surveyors' Institute.

Sir Wm. Bull seconded the instruction.

Mr. Walter Guinness said that under this particular section the County Council only proposed that appeals should be taken to them on the interpretation of the Act. They did not wish to have any powers of upsetting the decisions of the district surveyors on the ground of the reasonableness or otherwise of those decisions. If necessary, the Council would put that beyond doubt by altering the drafting. He pointed out that very technical matter arose, for instance, on sub-section 21, dealing with stress on iron pillars, and sub-section 24 relating to the amount of foundation necessary to take the load borne by a column. These matters required technical knowledge. The tribunal of appeal under the 1894 Act was costly, and not suited for matters of petty administration. He thought the Building Act Committee, which had skilled advice, was the best body which could be suggested at the moment. The Committee and its sub-committees dealt with 200 cases a week. Besides, an advantage to the builder lay in the fact that this Committee had certain dispensing powers. He asked the House not to accept the instruction.

Mr. John Burns said he did not feel enamoured of the present position of the district surveyor. He thought the surveyor ought to be an officer of the Council, paid, appointed, and subject to dismissal by that body. He hoped the day would soon come when fees were abolished, and when district surveyors with private practice would be abolished. At present the district surveyor was a law to himself. With regard to the proposal in the Bill, he thought it might be left to the Committee to hear the views of persons affected. He thought the Committee would perhaps modify the Bill to some extent in the direction desired by Sir F. Banbury, and he hoped the instruction would be withdrawn.

This course was agreed to.

Mr. Remnant afterwards moved an instruction to the Committee to leave out sub-section I. of clause 35, which extends the time for the compulsory purchase of lands for the widenings at Southampton Row from 1909 to 1912. He complained that for the last three years no steps had been taken by the County Council towards carrying out the powers granted them, and the reason given by the Council was that if they waited long enough they would be able to acquire the short leaseholders' interest without paying compensation. If such intention had been admitted when the powers were applied for in the first instance, he believed the House would not have given them. He thought this was a new way of carrying out an improvement which was urgently required.

Mr. Walter Guinness remarked that the practice was not new, and that three years was the usual period of extensions, although a longer period might have been originally necessary. By the extensions they were seeking, and would seek, the cost of the improvement would be reduced by one-quarter.

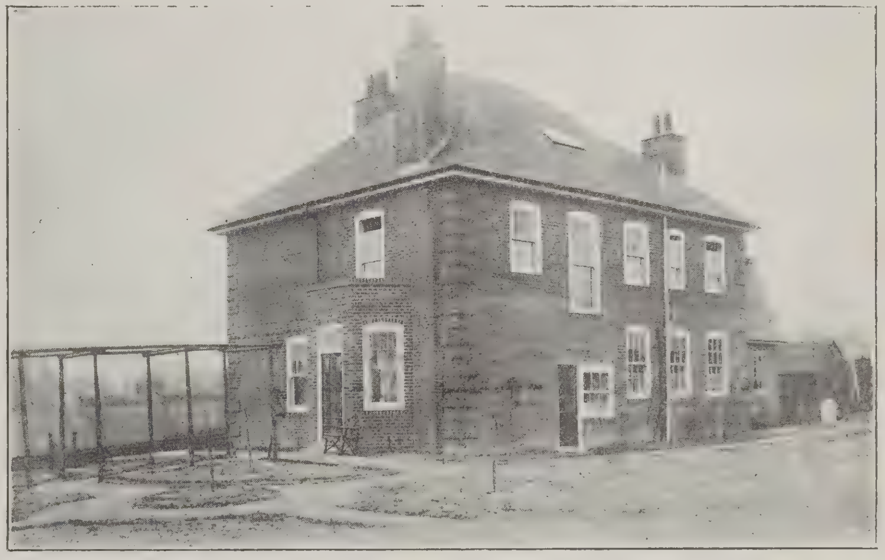
Mr. John Burns appealed to Mr. Remnant not to press his motion. If it were agreed to, the improvement would not be carried out for many years to come. He himself wished to see this improvement expeditiously carried out, as well as the one almost within the precincts of the House of Commons, namely, from Lambeth Bridge to the corner close by.

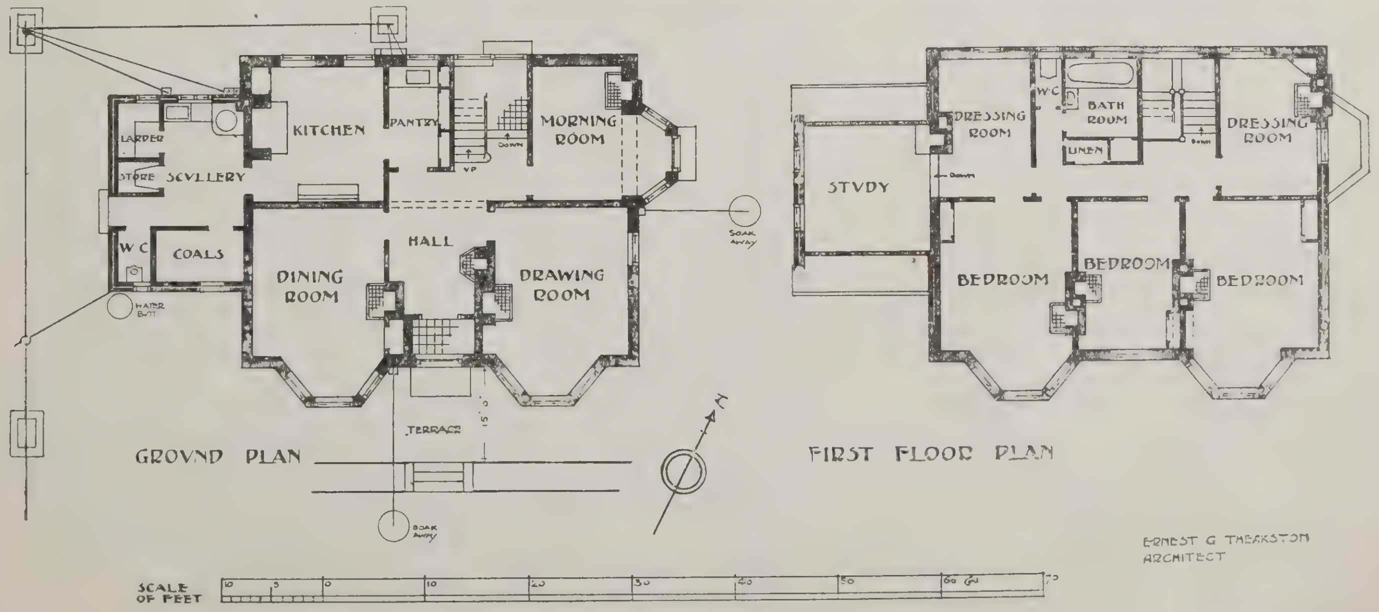
Mr. Remnant, while agreeing to the course suggested by Mr. Burns, declared that the County Council was trifling with the privileges of the House of Commons.

The instruction was then withdrawn.

HOUSE AT BERKHAMSTED.

This house is built on a high open site of about an acre, with local red bricks and tiles. The house is set back from the road some 80ft., in order to obtain uninterrupted views of the surrounding country, and to take advantage of the natural rise in the ground, which forms a terrace. The upper floor shows the study, bedroom, and dressing-room, planned *en suite* in accordance with the client's wishes. The architect was Mr. Ernest G. Theakston, of London, and the builders Messrs. J. Honour and Son, of Tring.





HOUSE AT BERKHAMSTED. ERNEST G. THEAKSTON, ARCHITECT.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
April 10.	BOLTON BRANCH PUBLIC LIBRARIES. The Libraries Committee of the Corporation invite competitive plans from architects who have been principals in the County Borough of Bolton six months prior to the present date for Branch Public Libraries to be erected in the districts of Astley Bridge, Halliwell, and Gt. Lever. The plans and particulars may be obtained from Samuel Parker, Town Clerk, Town Hall, Bolton. Deposit, two guineas.
April 12.	ELLAND NEW SECONDARY SCHOOL. Architects having offices and practising in the West Riding of Yorkshire are invited to compete for the work in connection with the new Secondary School at Elland, and should apply for particulars to Mr. Leonard Clegg, Holiwell Green, near Halifax.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading, Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second and third respectively. Assessor: Mervyn E. Macartney, F.R.I.B.A., F.S.A.
July 31.	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	BOURNEMOUTH BRANCH PUBLIC LIBRARY. Architects practising in the County Borough of Bournemouth are invited to submit designs for a new Branch Library at Boscombe. Particulars from Charles Riddle, Borough Librarian, Central Library, Bournemouth.
No date.	WALLASEY U. D. COUNCIL CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W: H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

Grimsby Town Hall Extension.

The Grimsby Town Council have decided to spend £30,000 on the above work, and are about to invite competitive designs. Premiums of £250, £150, and £75, are to be offered for the designs placed first, second, and third respectively.

Middlesbrough New Library.

The Free Library Committee have decided to ask the Royal Institute of British Architects to nominate an assessor for the above competition.

The proposal of Wimbledon Town Council to erect a new town hall and municipal buildings, at a cost of £30,000, is exciting strong opposition, and public meetings of protest are being arranged.

* * *

An "Everything for the Home" Exhibition is to be held in Bingley Hall, Birmingham, October 6th to 23rd of the present year. The organisers are the International Trade Exhibitions, Ltd., Broad Street House, London, E.C.

IDEALS IN BUILDING—FALSE AND TRUE.

Mr. M. H. Baillie-Scott, lecturing at the Carpenters' Hall on March 10th, explained that by the term "ideal" he meant an aim or aspiration of the mind, a dream which we hope to realise. We do not all, however, understand quite so well what is meant by building. Building nowadays has become a science, not an art, and it is of the art of building that he wished to speak. Art can be roughly defined as an occupation in which man seeks to satisfy, not only the needs of the body, but the aspirations of his heart.

All architecture is building which has flowered into beauty; but before we can obtain the flower, we must grow the tree. We must have an art of building first, and our builders and craftsmen must be artists, as in times past To attain to this, it will first be necessary to set them free from certain malignant ideals now generally followed.

The first of these may be called "the mechanical ideal." One aim only is followed by the modern architect and builder, and that is, to make all surfaces smooth, and all lines mathematically straight. If building is to be considered as a science, we might approve of this mechanical regularity; but art has other aims. Instead of the crude methods of the modern factory, art makes the workshop a school where materials may be educated. As an example, take oak for the material for the floor and doors and panelling of a building. It is obvious that a certain degree of smoothness and straightness is desirable. The finish to be obtained by the old hand tools, the drawknife, adze, etc., will be good enough, while at the same time expressing the toughness and woodenness of the oak, and the work will be full of character and charm. In the treatment of other materials, opportunity will be found for expressing the character of each. In the treatment of wrought iron, for instance, the best forms to be used will be those which suggest that this cold and hard substance was once in the furnace, ductile and soft. With other metals we may find a means of expressing the brassiness of brass, and the leadiness of lead. We shall find again and again, in the work of the past, that a certain degree of mechanical imperfection inevitably produced beauty. Take an old Tudor house for example. If we try to analyse the exterior, we shall find that the charm largely depends on the character of its outlines and surfaces. The ridge line is not straight, the tile courses are uneven, the walls are not vertical, nor the courses of brickwork horizontal, nor are the bricks and tiles equal in colour and shape. Inside we shall find the same absence of regularity. It must not be supposed that the lecturer wishes to advocate crookedness and the tumbledown picturesque. Expression of character must be the ideal, instead of mechanical perfection, and in striving to express character, our work will suggest the infinite rather than the finite, and that is the difference between art and science.

In looking at the creations of nature, one thing is evident, that the forms of things are always the outcome of functions. Our buildings, if they are to be true as the creations of nature, must consist of forms which are the outcome of functions. We must not, in designing a building, take a column and entablature, and then try to work them into the structure. Let us try to remember that forms and features have no reason for their existence apart from their uses, and when they arise naturally from the requirements of the building they assume an almost vital beauty.

The lecturer next dealt briefly with the ideal of novelty. Let us hold fast old things that are good, and not be deterred from accepting new things which are good, while rooting out all things that are bad. Do not accept old things because they are old, or new things because they are new. Although much of the "new art" is sorry stuff, sometimes we find the right note struck.

The commercial ideal in building is the outcome of a mind which thinks in pounds, shillings, and pence. Most of our modern buildings are entirely commercial in their functions. They are places for getting and spending money in. It is necessary that they should reek of wealth. Also they have to impress those droves of people who go about the world gaping at fine buildings.

The utilitarian ideal is the next false ideal to consider, the more insidiously dangerous because it is half true. No one can deny that our houses should be conveniently planned and fitted for our comfort. When a man is most truly himself, he can only be satisfied with Divine things; and it is the mission of man to supply this demand. We must rise above modern materialism, and believe that there are Divine things in nature and in art.

Correspondence.

The Fair Wages Resolution.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Mr. Hodge's resolution having been rejected, it would apparently be waste of time to discuss it, but for the fact that the principle of that resolution is being forced on town and district councils. There is one aspect of the Labour proposition that has been overlooked. It demands that "the contractor shall under penalty pay to all the workmen in his employ," etc. No distinctive reference is made to the apprentice or improver. If the compulsion is to pay to "all" a uniform rate of wage, surely the employer can demand a certificate of competency for "all"; for it would be manifestly unjust to expect the employer to train and educate the apprentice or improver, and at the same time be compelled under penalty to pay him the uniform rate.

Yours truly,
WM. MIDDLETON.

Law Case.

Ferro-Concrete Piles: Patent Rights Appeal.

The action which was commenced by Messrs. Hennebique and Mouchel against Mr. Edmond Coignet, Messrs. William Cowlin and Son, and Mr. G. C. Workman, in 1905, for alleged infringement of a Hennebique's patent, dated 1897, for ferro-concrete piles, was finally disposed of by the House of Lords last month.—Mr. Justice Warrington, who tried the action in June and July, 1906, held that the patent in question was valid, and that one of the defendants, viz., Messrs. Cowlin and Son, had infringed claim 1, by using certain piles at Bristol constructed under the "Coignet" system. On Messrs. Cowlin and Son appealing, however, the Court of Appeal unanimously decided that the patent in question had been anticipated. Mr. Hennebique—one of the respondents—then appealed from this decision, but on February 23rd last the House of Lords dismissed the appeal with costs.—Mr. Coignet (whose English business is managed by Mr. Workman) is thus free to continue the construction of piles under his system, either direct or through licensees.

It is not often that a contractor finds a free coal mine as an additional recompense for a contract job, but such a happy fate has befallen Mr. John Thomson, of Alloa. Mr. Thomson, in excavating the foundations for an extension to the works of Messrs. John Paton, Son and Co., of Alloa, came across what appeared to be a seam of coal, 18 inches thick, and it has been ascertained that this is the extreme westward position of the Whinhall Pit Cherry seam. About 40 tons of household coal has been taken out, and of this Mr. Thomson has generously given away 30 tons to the poor of the district.

THE LIVERPOOL CHAIR OF CIVIC DESIGN.

Mr. S. D. Adshead Appointed.

Mr. Stanley D. Adshead, F.R.I.B.A., who has been appointed to the Associate-Professorship in Civic Design in the University of Liverpool, of whom a portrait is here shown, was born in 1868, and was elected a Fellow of the Royal Institute of British Architects in 1905. Besides being a close student of town planning, he is an exceptionally skilful draughtsman, and his beautiful drawings are familiar to all frequenters of the Royal Academy, where he has exhibited as many as a dozen works at a time.

Mr. Charles H. Reilly, the Roscoe Professor of Architecture in Liverpool University, is doing splendid work in the School of Architecture; and when the University availed itself of the munificent offer of Mr. W. H. Lever, M.P., to contribute about £1,000 a year for three years for the establishment of what is virtually a school of town planning, the council determined to secure the services of the best man obtainable as Associate Professor of Civic Design.

It was considered to be essential that the candidate chosen should be able to furnish satisfactory evidence of his power to conceive original schemes for the grouping of buildings and the fitting disposition of their masses, and that he should possess the ability to express clearly and convincingly his ideas, particularly in such pictorial form as the public could appreciate. To these qualities it was desirable that there should be added the power to apply general ideas to the detailed consideration of practical and immediate problems in town planning. With these considerations before them, the committee, after a survey of the possible field, unanimously decided that Mr. Adshead most completely met the requirements.

In day and evening courses in the University, covering each a period of about six months, and systematically arranged to include lectures and studio work, special attention will be given to the lay-out of areas and the architectural problems connected with them; whilst the engineering and surveying aspects of the question will not be overlooked, but, for the first time, will be approached from the principles which should determine the architectural treatment of sites and areas of various types. In connection with the courses, a diploma and certificate in civic design will be established by the University.

In the proper equipment of the school, thanks again to the generosity of Mr. Lever, provision has been made for the formation of an adequate library and collection of maps, drawings, and designs, and for the appointment of commissioners to obtain information as to the experiments in civic design already made in France, Germany, and in America, for which purpose Professor Reilly, to whose energy the University is much indebted, has already sailed to America.

The duties of the chair (to which is attached a lecturership and a research travelling fellowship) include, beside the provision and supervision of instruction, the conduct and direction of research into the problems connected with the design and development of modern towns, including the production of drawings of schemes for the treatment of specific problems, as well as initial and historical surveys of existing work and the publication of the results of this research.

The school will open in October, 1909, and a complete prospectus of its work will shortly be issued. It will be scanned with eager interest; for the importance of considering separate pieces of architecture in their relationship to each other and to a general scheme is thus for the first time specifically insisted upon. Mr. Adshead will doubtless give special consideration to architectural composition in the fullest sense of the term; and upon the manner in which the whole problem is attacked at Liverpool University it will depend whether or not in the immediate future a special course at a School of Town Planning is to be considered to be a necessary complement to the education of every architect.

MR. STANLEY D. ADSHEAD, F.R.I.B.A.,

who has just been appointed Associate-Professor of Civic Design at the University of Liverpool.

In Parliament.

By our Gallery Representative.

Imported Joinery and Home Employment.

From information supplied by the Board of Trade, it appears that the value of imported manufactured house joinery has rapidly and steadily decreased during the past five years. The figures for the years from 1903 to 1908 were:—1903, £469,227; 1904, £332,627; 1905, £317,288; 1906, £272,949; 1907, £224,596; 1908, £209,632. The mean monthly percentage of carpenters and joiners reported as unemployed in trade unions in each of the last ten years was:—1899, 1.2 per cent.; 1900, 2.6; 1901, 3.9; 1902, 4; 1903, 4.4; 1904, 7.3; 1905, 8; 1906, 6.9; 1907, 7.3; 1908, 11.6.

Queen Victoria Memorial.

Mr. Harcourt has informed Sir Wm. Collins, who addressed to him a question regarding the progress of the Queen Victoria Memorial, that a large portion of the sculpture is completed, and that arrangements have been made to begin fixing it as soon as possible. The fountains and marble work around the base have been finished, and it is intended to remove the hoarding during April, when they will be visible to the public. Mr. Harcourt finds it impossible to name an actual date for completion of the memorial.

More Government Buildings.

Mr. Harcourt, in reply to Mr. Lane-Fox, stated that progress had been made towards a scheme for the better housing of the Board of Agriculture. A scheme was proposed for building on the site, Nos. 9, 10, and 11, Whitehall Place, and a provision of £1,500 was included in the estimates of this year.

New Wing of the British Museum.

Mr. Harcourt stated, in reply to Sir Wm Bull, on Wednesday last, that 35 men were employed at the building of the new wing of the British Museum, and 36 at the stoneyard. He understood that on March 29th an additional 25 would be employed. The contract date for the completion of the work was January 31st, 1911, and no delay was anticipated, except on account of possible bad weather.

Foreign Material in Government Contracts.

The Home Secretary having decided that contractors for his department shall be invited to send in alternative tenders, specifying separately the price for foreign and home manufactured goods in respect of the contracts, Mr. Claude Hay asked the Prime Minister whether the same principle would be applied to all Government Departments. Mr. Hobhouse, Financial Secretary to the Treasury, replied that in view of the great variety of goods which were the subject of Government contracts, the question was one which must be left to the discretion of the departments concerned. He had no objection to calling the attention of the other departments to the action of the Home Secretary.

The Old Arches of Hampton Court.

Dr. Rutherford asked the First Commissioner of Works if he would state whether the excavations now in progress at Hampton Court Palace were being undertaken by his direction; and, if so, whether he was able to give any description of them; and whether it was intended to proceed further with them.

Mr. Harcourt in reply said:—The excavations at Hampton Court Palace have been instituted in consequence of enquiries made by the late Mr. Fitzgerald, Acting Inspector of Ancient Monuments to the Office of Works. They are being carried out with the approval of His Majesty, and by my authority. The work is entirely in the hands of my Department. The remains of the ancient bridge, which is believed to have spanned the moat at the great entrance, have been unearthed. It is hoped that it may be possible to remove the soil from it and to expose the original moat.

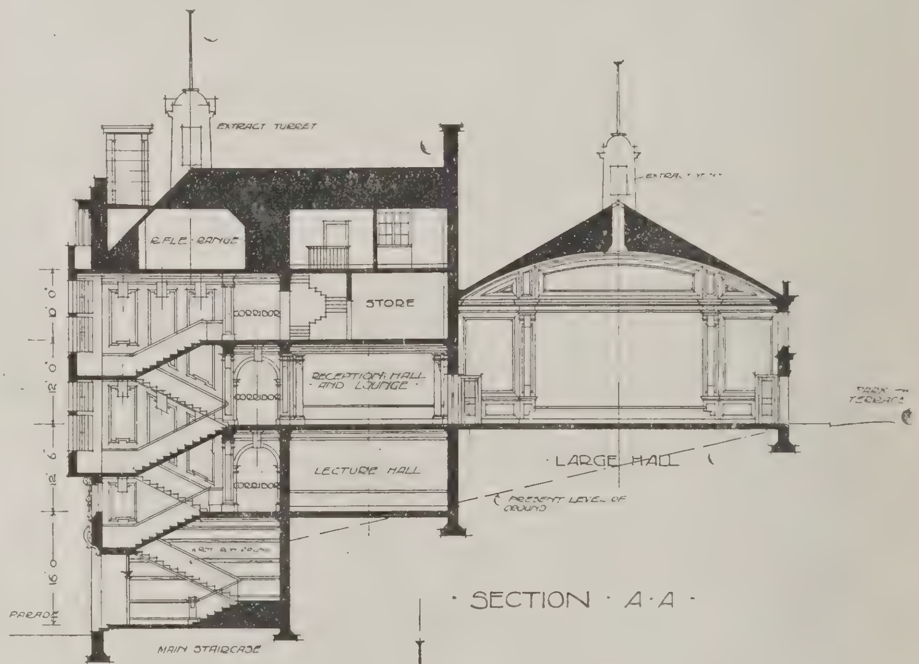
NEW MUNICIPAL WORKS.

The Local Government Board has decided to hold, or has recently held, as indicated by the respective dates, inquiries into proposed expenditure by public bodies as follows:—Water Supply Works and Plant: Driffield R.D.C., £3,650 for Nafferton (March 25); Kingsbridge U.D.C., £800 (March 25). Electric Light Power Supply Works and Plant: Lowestoft U.D.C., £2,000 (March 23); Hastings B.C., £5,000 (March 23). Sewerage, drainage, and sewage disposal works and plant: Tewkesbury R.D.C., £20 for Ashchurch (March 23); Wetherby R.D.C., £2,3000 for East Keswick (March 24); Rotherham R.D.C., £9,875 for Laughton-en-le-Morthen (March 24); Hemsworth R.D.C., £937 for South Hiendley (March 23); ditto, £320 for Ashton-cum-Aughton (March 25); Uckfield U.D.C., n.a.s. (March 24); Limehurst R.D.C., £1,480 and £2,890 for Bardsley and Waterloo (March 25); Sheffield C.C., £6,130 (March 25); Hastings B.C., £105 (March 23); Newquay U.D.C., £11,000 (March 24). Street improvements, widenings, new roads, public walks, and pleasure grounds: Hanley B.C., no amount stated (March 18); Padiham U.D.C., £12,064 (March 24); Liversedge U.D.C., £980 and £690 (March 23); Odbury U.D.C., £2,600 (March 26); Lowestoft B.C., £434 (March 23); Willesden U.D.C., £16,708 (March 24); East Ham B.C., £3,515 (March 18); Kingston-upon-Hull C.C., £5,434 (March 26); Sheffield C.C., £2,650 (March 26); Atherton U.D.C., £11,739 (March 25); Hastings B.C., £2,272 (March 23); Newquay U.D.C., £2,000 and £1,860 (March 24). Various: Norwich C.C., £2,300 for underground conveniences (March 22); Atherton U.D.C., £400 for gasworks (March 25); Penistone U.D.C. £1,000 for cattle market (March 23); Uttoxeter, £3,000 for cattle market. Water supply works and plant: Basford R.D.C., £4,000 for Ruddington (March 31); Neath R.D.C., £697 for Michaelstone-super-Afon Lower (March 30); Godalming B.C., £9,535 (April 2); Hexham R.D.C., £400, for wall (March 31); Uttoxeter U.D.C., £5,000 (March 24); Belper R.D.C., £12,000 for Denby, Horseley, Horseley Woodhouse, Kilburn, and Smalley (March 30). Electric light and power supply works and plant: Leyton U.D.C., £1,650 (March 31). Sewerage, drainage, and sewage disposal works and plant: Dunstable B.C., no amount stated (April 2); Weetslade U.D.C., £3,000 (April 1); Aberavon B.C., £114 (March 31). Street improvements, widenings, new roads, public walks, and pleasure grounds: Congleton B.C., £1,200 (April 1); Chester-le-Street R.D.C., £1,174 for Birtley (March 31); Woodford U.D.C., £830 (April 2); Higher Babington, £1,660 (March 30); Merton U.D.C., £1,821 (March 29); Wood Green U.D.C., £3,900 (March 30); Great Crosby U.D.C., £1,200 (March 31); Aberavon B.C., £600 (March 31); Richmond (Surrey) B.C., amount not stated (April 2). Various: West Bromwich B.C., £11,000 and £756 for refuse destructor (March 30); Acton U.D.C., £250 for footbridge (April 1); Dudley B.C., £2,250 for refuse destructor (March 31); Willenhall U.D.C., £107 for urinal (April 1); Newton and Llanllwchairan U.D.C., £600 for refuse destructor (April 1); Neath R.D.C., £203 for gas mains at Michaelstone-super-Afon Lower (March 30); Penarth U.D.C., £300 for fire station (April 1); Aberayron U.D.C., £1,000 for public slaughterhouse (March 29); Morpeth R.D.C., £300 for bridge at Low Angerton (April 2); Aberavon B.C., £7,450 for gas undertaking (March 31).

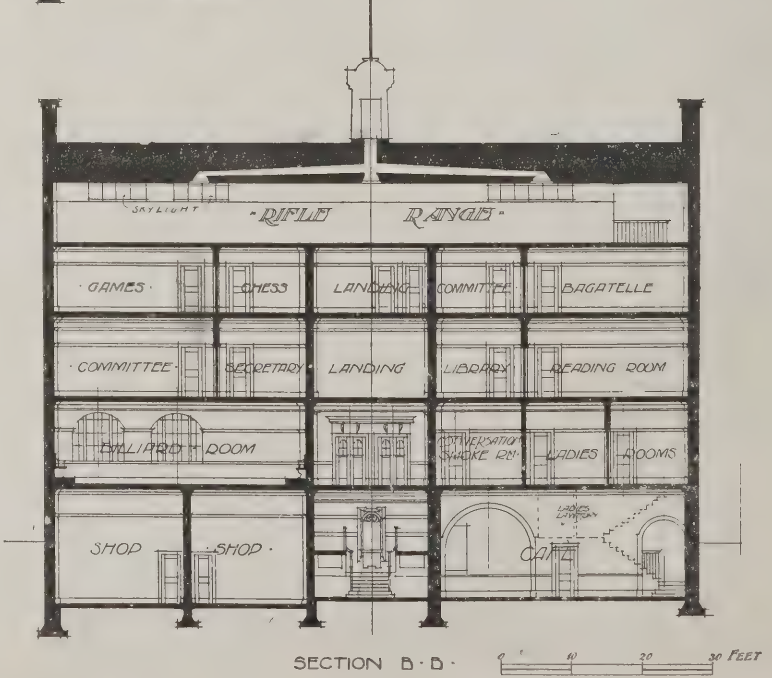
Our Plate.

The design illustrated in our centre plate is that awarded the first place in an open competition for the new Y.M.C.A. building at Merthyr Tydfil. The structure is planned in three blocks suitable for erection one at a time, and we understand that the front and middle blocks are to be proceeded with at once, at a cost of about £5,000; leaving the rear block, containing the large hall, etc., to be erected later. The site is a very sharply sloping one, there being a difference of no less than 30ft. between the front and back roadways. The front block will contain on the ground floor:—Two shops on one side, and a large café, with kitchen behind; on the other side of main entrance: on the mezzanine floor, a billiard room for two tables, smoke room, and two ladies' rooms: on the first floor, which is level with the back road, a committee room, secretary's room, library, and reading rooms; on the second floor, games rooms, and a committee room; and, in the roof, a rifle range. In the middle block there is (mezzanine floor level) a lecture hall for 105, divisible into two parts; on the first floor, a reception hall and lounge; on the second floor, games rooms, stores, slipper and shower baths; and in the roof, accommodation for the caretaker. The facings are to be of face brick with terra-cotta dressings. The architects are Messrs. Ivor Jones and Percy Thomas, of 18, St. Mary Street, Cardiff, whose design in a competition for a similar building at Pontypridd last year was placed second.

A party of delegates from the Garden City Association will leave London on April 8th for a tour of inspection of the great cities of Belgium and Germany, including Brussels, Cologne, Dusseldorf, and Frankfort.



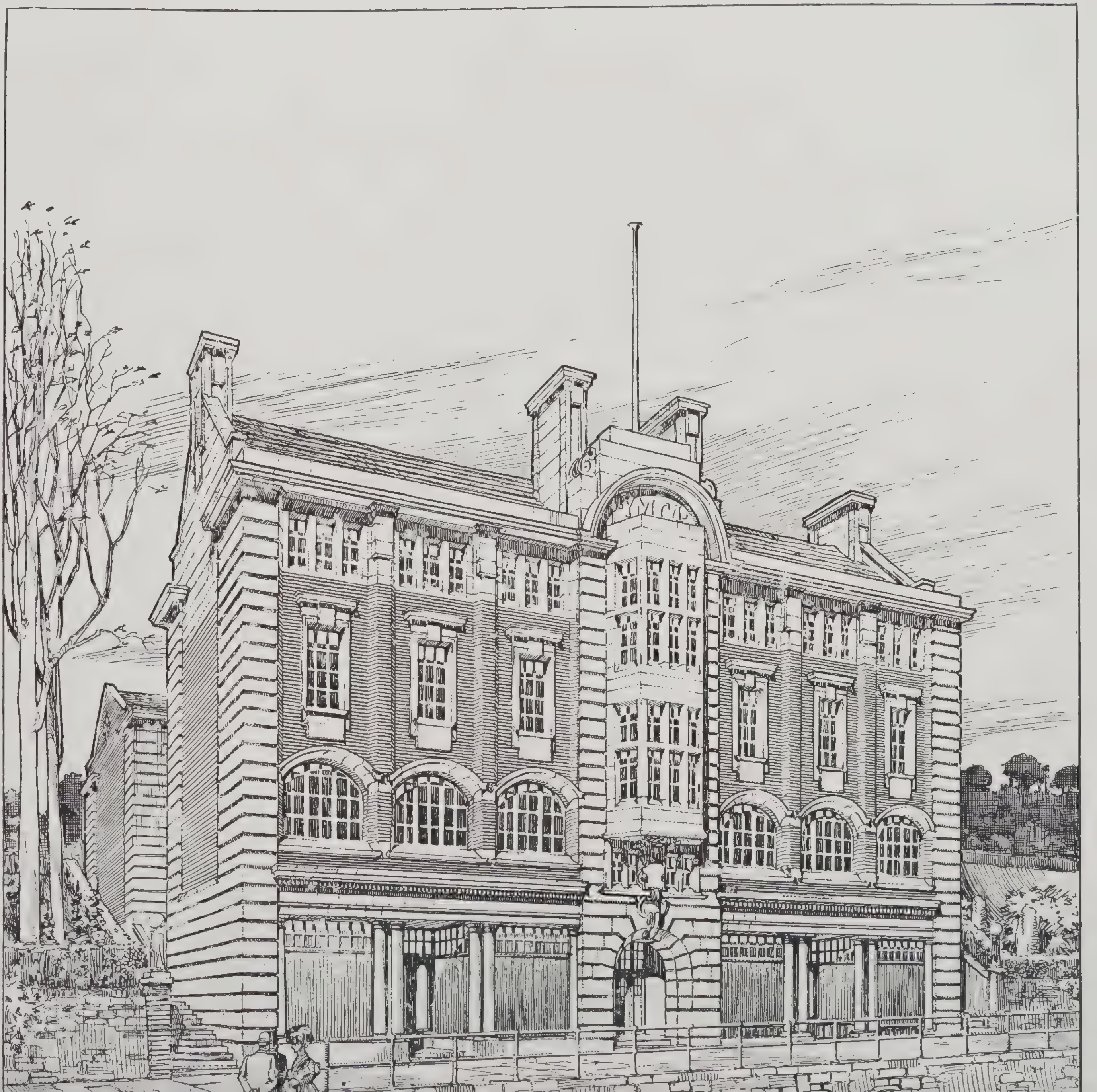
· SECTION · A·A ·

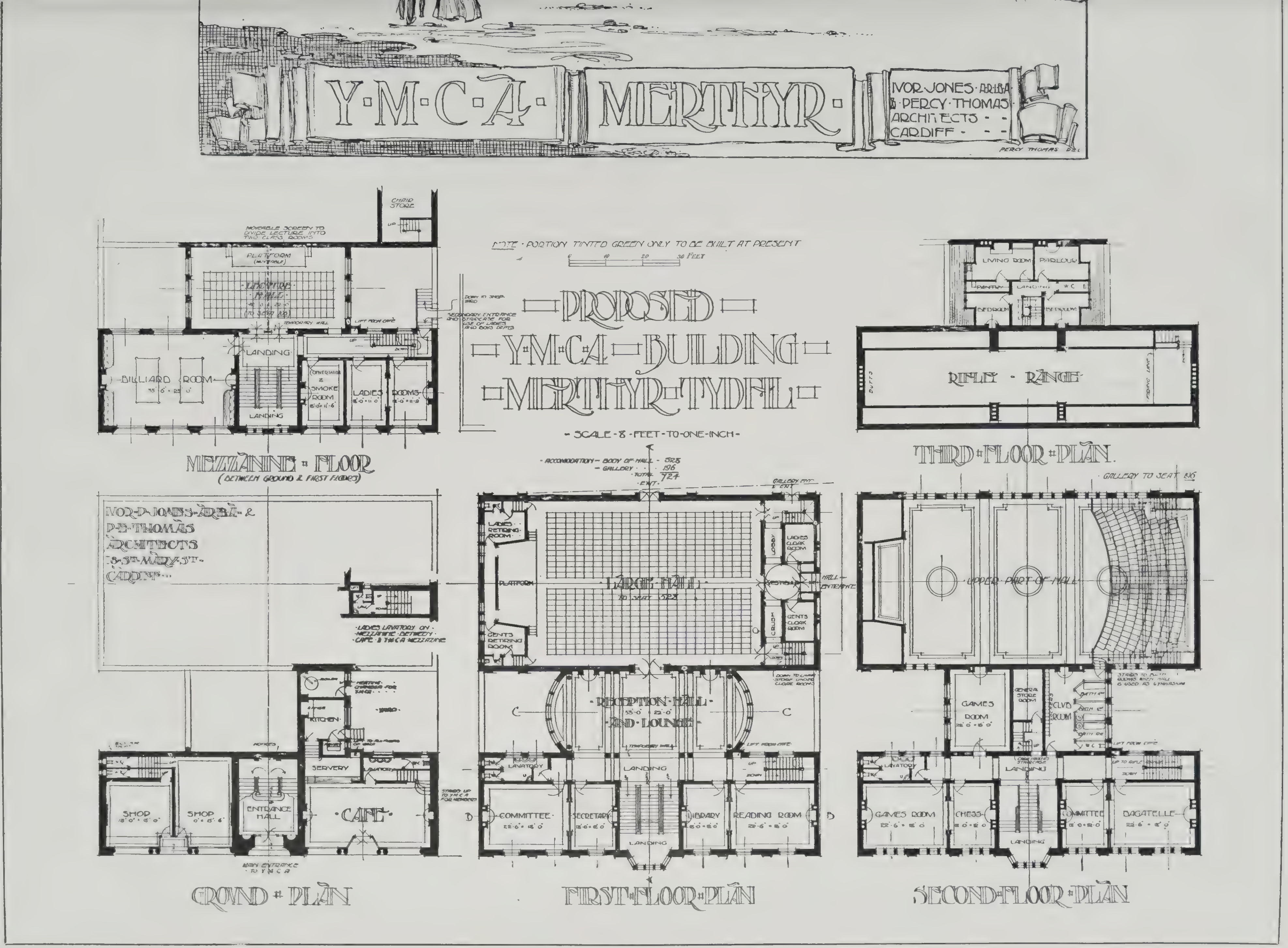


SECTION B·B ·

Y.M.C.A. BUILDING, MERTHYR TYDVIL: SECTIONS. IVOR JONES AND PERCY THOMAS, ARCHITECTS. (See Centre Plate.)

Supplement to THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER. *Wednesday, March 31st, 1909.*




Y·M·C·A· MERTHYR·
IVOR JONES · A.R.I.B.A
& PERCY THOMAS
ARCHITECTS - -
CARDIFF - - -
PERCY THOMAS DEL
NOTE · PORTION TINTED GREEN ONLY TO BE BUILT AT PRESENT
0 10 20 30 FEET
PROPOSED
Y·M·C·A· BUILDING
MERTHYR TYDFIL
- SCALE - 8 - FEET - TO - ONE - INCH -
- ACCOMMODATION - BODY OF HALL - 528
- GALLERY - - 196
TOTAL 724
· ENT ·
CHAIR STORE
UP
MOVEABLE SCREEN TO DIVIDE LECTURE INTO TWO CLASS ROOMS
PLATFORM (MOVEABLE)
· LECTURE · HALL ·
(TO SEAT 100)
TEMPORARY WALL
LIFT FROM CAFE
DOWN TO SHOP YARD
SECONDARY ENTRANCE AND STAIRCASE FOR USE OF LADIES AND BOYS DEPTS
BILLIARD ROOM 35' 6" × 25' 0"
LANDING
LANDING
CONVERSATION & SMOKE ROOM 15'-0" × 11'-6"
LADIES ROOMS 15'-0" × 11'-0" 15'-0" × 11'-9"
UP
DOWN
MEZZANINE FLOOR
(BETWEEN GROUND & FIRST FLOORS)
IVOR-P-JONES-A.R.I.B.A.- &
P-E-THOMAS
ARCHITECTS
18-ST-MARY-ST-
CARDIFF
LIFT
·LADIES LAVATORY ON · MEZZANINE BETWEEN · CAFE & Y.M.C.A MEZZANINE
BOILER
HEATING CHAMBER FOR BAGS
RANGE
KITCHEN
YARD
SERVERY
LAVATORY
NOTICES
STAIRS UP TO Y.M.C.A FOR MEMBERS
SHOP 18' 0" × 15' 0"
SHOP 0' × 15' 6"
ENTRANCE HALL
· CAFE ·
MAIN ENTRANCE · TO Y.M.C.A
GROUND PLAN
GALLERY ENT & EXIT
LADIES RETIRING ROOM
PLATFORM
GENTS RETIRING ROOM
LARGE HALL
TO SEAT 528
LOBBY
LADIES CLOAK ROOM
VESTIBULE
HALL ENTRANCE
CRUSH
GENTS CLOAK ROOM
DOWN TO LARGE STORE UNDER CLOAK ROOM
· RECEPTION · HALL ·
55'-0" × 22'-0"
· AND · LOUNGE ·
TEMPORARY WALL
LIFT FROM CAFE
C
C
D
D
LAVATORY
LANDING
LANDING
UP
DOWN
COMMITTEE 22'-6" × 15'-0"
SECRETARY 15'-0" × 12'-0"
LIBRARY 15'-0" × 12'-0"
READING ROOM 22'-6" × 15'-0"
FIRST FLOOR PLAN
LIVING ROOM
PARLOUR
PANTRY
LANDING
W C
BEDROOM
BEDROOM
BUTTS
FIRING LINE
RIFLE · RANGE
THIRD FLOOR PLAN.
· GALLERY TO SEAT 196
UPPER PART OF HALL
STAIRS TO BATH ROOMS WHEN HALL IS USED AS GYMNASIUM
GAMES ROOM 22' 0" × 15' 0"
GENERAL STORE ROOM
CLUB ROOM
BATH RM
BATH RM
BATH RM
W C
LIFT FROM CAFE
UP
UP TO RIFLE RANGE
DOWN
LAVATORY
CONTINUOUS STAIRCASE
LANDING
LANDING
GAMES ROOM 22'-6" × 15' 0"
CHESS 15' 0" × 12' 0"
COMMITTEE 15' 0" × 12' 0"
BAGATELLE 22'-6" × 15' 0"
SECOND FLOOR PLAN

CONCRETE AND STEEL SECTION.

(MONTHLY.)

THE CONCRETE INSTITUTE.

The monthly meeting of the Concrete Institute was held on Thursday, March 18th, at the Royal United Service Institution, Whitehall, S.W. There was an excellent attendance, over which Mr. A. Ross, M.Inst.C.E., the Chief Engineer of the Great Northern Railway Company, presided. Among those also present were Mr. E. O. Sachs, Mr. E. P. Wells (hon. treasurer), Mr. H. Kempton Dyson (secretary), Mr. Herbert Brooks, Professor Hy. Adams, Mr. Chas. Reid, Mr. Percy Tomey, Mr. Lucien Serraillier, etc.

Mr. Sachs at the outset stated that the membership of the Concrete Institute, at their last meeting, was 551, and now it was 585, which made one new member per day since the last meeting.

Mr. E. P. Wells then read a paper on "Concrete in Arched Bridge Construction," which was illustrated with limelight views and diagrams.

The lecturer explained that he intended to confine himself principally to pivoted arches, which were theoretically and practically the only form of plain concrete arches that ought to be constructed, and he would show how pivoting at both the springings and centres came to be adopted.

Curve of Equilibrium.

Previous to the adoption of the pivot at both the springing and centre of the arch, it was felt by German engineers that some method should be adopted whereby the curve of equilibrium could be absolutely confined with the centre third. It was well known that in a stone arch it was almost impossible to ascertain where the curve of equilibrium would run, as everything depended on perfect construction, especially in the grouting of the joints, etc.; any defects in grouting up would cause an alteration in the curve of equilibrium, and in all probability might endanger the safety of the structure. It was this difficulty in bedding stones of large area that had compelled engineers to put such a large amount of material in stone arches so as to be on the safe side.

Pivoted Bridges.

The first pivoted concrete bridge from the design of the late President von Liebbrand that was constructed in Wuttemburg was a large one, viz., 164ft. span, and was the pattern in respect to facilitating erection, reducing the dimensions in the arch, and the use for the first time of the pivot at the springings and centre, which since then had been invariably adopted for concrete arch construction on the Continent, excepting those cases where the concrete had been reinforced with steel, and the arches made with fixed springings and practically continuous from abutment to abutment.

Constructien of Concrete Bridges.

The lecturer then proceeded to describe the construction of a concrete bridge having a span of 150ft. with a rise of 19ft.; this bridge, the dimensions of which he gave, was strong enough to carry the heaviest possible vehicular traffic, as also the heaviest railway traffic, and to carry a load of over 3cwts. per foot super, on one-half, with the other half unloaded, and all this without the use of steel in its construction; but if steel were used then the loads could be very materially increased.

The principal reason why these concrete bridges were so safe under unequal loading was due almost entirely to the pivots at the springings and centre, which compelled the curve of pressures to pass through the same, the only sensible variation in the curve being at the haunches; even the loading given would not in any case alter the curve so that it passed above or below the middle third. Such being the case, it would be observed that no part of the arch could be in tension; but should such a thing happen theoretically, the spandril walls, by their great rigidity, would prevent any distortion of the arch; and, if the spandril walls and tables were reinforced, it would be possible to put a tension of 10 to 15 tons in either the extrados or intrados without the structure collapsing or changing its form.

Another advantage that a concrete arch possessed over a brick or stone arch was its homogeneity, there being an absolute lack of joints which were an element of weakness, as was the mortar in the joints; *e.g.*, in the case of a granite arch, 1-20 the crushing strength of the stone itself if made of lime and ¼ the strength if cement grout were used—then why use a material that was stronger than the weakest part?

The Arch.

In designing a concrete arch, it would be found necessary to start on the assumption that the thinnest part of the arch, viz., at the centre, is approximately one-fiftieth of the span; this you must increase at the springing by about 7 per cent., and at the haunches by about 27½ per cent., to allow at this point for varying loads tending to make the curve of pressures rise or fall either below or above the neutral axis, and so to always keep the said curves within the middle third.

Having then apportioned the sizes of the spandril walls, or spandril pillars, to the loads that the bridge is intended to carry, also the intermediate tables and tables to carry the vehicular and foot traffic, proceed to ascertain the weight of the structure and find the curve of equilibrium for the dead load only; having ascertained that make it the neutral axis of the arch, and alter the shape of the extrados and intrados by compounding the curves so as to make both equi-distant from the netral axis. The normal condition of a concrete bridge was its dead load, and the greatest stresses were set up by the dead load; so the lecturer considered that, unless extraordinary loads were to be passed over the bridge, it was not necessary to take into account the live load, especially if it were only ordinary or vehicular traffic. If the curves for equally distributed loads and also for one half of the arch loaded were worked out, it would be found that the curve of equilibrium at the haunches did not vary more than 3in. either above or below the neutral axis; in the case of a heavy rolling load, it was only when the load was at the centre of the span, or a few feet on either side of it, that the increased stresses at that point in the arch could be accurately calculated; because nearly the whole width of the arch, from the point under the load to the springing, took up the stresses induced, and the same were reduced to a minimum by the enormous area of arch that they were spread over; the reason why concrete arches were so strong was that the stresses induced by the weights were so well distributed; otherwise there would, no doubt, be distortion of the arch and great deflection at the centre, whereas in no case, where exhaustive tests had been carried out, had this been proved.

Under this circumstances it was perfectly permissible to reduce the thickness of the arch until the stresses amount to 36 tons per sq. ft.; but it would then be required to ascertain the positions of the curves of equilibrium for dead load, equally distributed live load, and also for one-half of the arch loaded, and likewise for the maximum rolling load placed in the centre of the span; the neutral axis could then be made the mean of all the curves.

The effect of this would be that at the haunches, for dead load only, the compression at the intrados would be slightly increased, and correspondingly reduced at the extrados; the curve of the intrados would not require so much compounding, but would be more segmental in form, unless they were placing excessive dead loads on the haunches, when the curves of pressure would rise, and so enable the curves of the intrados to be compounded and the appearance of the arch very materially improved.

If it were possible in concrete arch construction to make the arch so that the dead load were equally distributed, then the curve of equilibrium would be a parabola; but the appearance of the arch would suffer, though theoretically correct.

Spandril Walls.

In all cases the spandril walls, and also the concrete filling over the arch beyond the spandril walls at the centre, should be bonded to the arch by means of stone figs, or old iron rods, in the shape of bolts, etc., etc., as by this means any separation taking place between the extrados of the arch and the spandril walls could be absolutely prevented, and the cementitious nature of the concrete had not to be depended upon, which was not always desirable unless very great care be taken in roughing the concrete and making the same absolutely clean.

Centerings.

The centres needed for the erection of a concrete arch were similar in every way to those required for a stone or brick arch, with this exception, that less strength was wanted, owing to the fact that a concrete arch weighed less. Where it was required to construct the whole arch of concrete, and make imitation stone voussoirs, special shuttering must be made.

Order of Fixing Voussoirs.

It was advisable, when forming the concrete voussoirs, always to place the first voussoir between the points of support of the centres, not over the supports; thus, if any deflection was caused by the weight, it was put into the beam before the remaining voussoirs were made. In closing in with the voussoirs, Nos. 3, 5, 7, 9, and 11, care should be taken that the faces of the existing concrete voussoirs were thoroughly clean and well roughened; and, as the concrete was brought up, neat cement grout or 1 to 1 cement mortar put on the faces of the existing concrete, so that a perfect bond was obtained between the new and the old. When ramming the concrete, care should be taken that the existing faces of the voussoirs were not in any way damaged. To prevent this it was advisable to use special hardwood rammers. Lest, by any chance, the faces of the voussoirs previously put in should be honeycombed, some 1 to 1 mortar should be used to fill up all interstices previous to the concrete being filled in. After the completion of the voussoirs Nos. 2 to 12, it became necessary to adjust the granite blocks.

Pivots.

The pivots should be made of the best annealed cast steel, carefully machined all over to uniform thicknesses; the rolling curves should be machined and finished to a dead smooth surface, the pivots being forced into the bearing plates by hydraulic pressure; if it be found that the faces of the pivots were not parallel with the bedplate, then the back of the same must be re-machined. The granite bearing stones must be recessed for about 1 to 1½in., and the bearing surface bush axed or (which is preferable) sand rubbed, as it was advisable that there should be no inequalities in the stone to prevent a perfect bearing being obtained. The stones should be made in about 2ft. 6in. lengths, and the pivots should be about 1in. less in length. The joints for these stones should be about ¾in., and were not to be made until after the final concrete voussoirs were filled in.

Before fixing the pivots in the stones, sheet lead, about ⅛in. thick, should be put in the recess in the stones, and the pivots laid in and well hammered with a heavy wooden mall; after which the stones should be fixed in position, and very great care exercised in gauging the distances between the rails, so as to ascertain whether the bearing of the two rails is true; any inequality in the position of the stones could be obviated by packings laid on top of the laggings.

Use of Screw Jacks for Fixing Pivots.

After all the stones were in their correct positions, it would be necessary to obtain four screw jacks so as to force the pivots as close together as possible, and at the same time put a certain amount of compression on the lead seatings; when this was done, 2in. square iron or steel bars shall be forced between the back of the stones and the concrete voussoirs Nos. 2 to 12, so as to prevent any movement when the screw jacks are taken away. After all the stones were placed in position the concrete voussoirs Nos. 1 and 13 should be filled in; the voussoirs in the centre ought to be filled in simultaneously.

Roadway.

After the centres were finally struck, the concrete over the arch, forming the roadway and footway, might be filled in, care being taken to make an expansion joint over the pivots in the centre of the span, and also at the swinging pivots. In this country a joint ⅛in. was sufficient at the centre, and the same could be made with soft felt; but at the springings, if the concrete be put in in cold weather, fully ½in. must be allowed. In forming the roadway, whether of wood paving, granite pitching, asphalt, or macadam, the expansion joint might be ignored, though one must be put in on the footways, especially if the same were made of York paving or concrete. In order to allow the arch to expand, the outer spandril faces must not be bonded to the abutments or piers, but be recessed into the same so as to allow perfect freedom of action; this also applied to the parapet and cornice, because, if securely fixed, an accident was bound to happen in winter if the bridge were completed in summer, and vice versa.

The lecturer then described some tests on a model bridge of 150ft. span to a scale of ½in. to the foot, and then described a few of the principal concrete bridges that have been erected abroad, commencing with the Coulouvrenière Bridge across the Rhone at Geneva. These were illustrated by means of lantern slides. Finally, the lecturer made extended remarks on the making of concrete and the proper proportions that ought to be used for different kinds of work. The results of many tests and experiments on concrete carried out by the lecturer formed addenda to the paper.

Discussion.

At the conclusion of the paper, the Chairman said they had had a very excellent paper, full of practical results and practical advice. His only regret was that Mr. Wells had been obliged to pass over a lot of most useful things, including the making of concrete, the proportion of materials, tests of concrete, materials to be weighed and not measured, concrete made of Thames ballast, and mixing by machine and by hand.

PROFESSOR HENRY ADAMS said he thought the Concrete Institute was much indebted to the author for his paper, which he thought might be described as almost of monumental size, representing the cream of a ripened experience. It contained a large amount of practical information, so much, in fact, that it was difficult to grasp all of it in one sitting. The chief value of some papers lay in the discussion upon them, but this paper had great merits of its own. In the commencement of the paper, the author said that engineers in the past had only considered concrete good enough for retaining walls and foundations, and that some engineers did not place much faith in it, even for the latter work. That was rather in the nature of news to him. He had thought that if engineers had any faith in anything at all it was in concrete foundations. Mr. Wells spoke of from 2 to 2½ tons per sq. ft., the concrete being made in the proportion of 4 to 1 for foundations. If that was a fact, he thought it was the exception that proves the rule.

Mr. Wells said that that was the fact with the Prince of Wales Pier at Dover.

Professor Adams, continuing, said that engineers could not, as a rule, afford to put in concrete of such value as 4 to 1, except in certain cases where the foundations were very thin and spread out, and reinforced with metal, and then naturally the stronger concrete was used. With regard to concrete being able to carry with perfect safety 100 tons per sq. ft. two months after being made, although it only had to carry 2 to 2½ tons, it should be remembered that the intensity of the load was on the top, and that the spread must suit the soil below, which must be always very much less. Mr. Wells spoke of pivoted arches as theoretically and practically the only form of concrete arches that ought to be constructed. That applied where rolling loads were carried, which gave a lopsided curve of thrust when the load was over one of the haunches, and pivoting practically eliminated that difficulty. Mr. Wells mentioned the centre third of the arch as the part where the curve of equilibrium should be contained. He did not mention a very common fallacy with regard to the middle third. It was commonly supposed that when any line of thrust passed within the middle third of a bearing surface, the joint was safe. The middle third only gave them this result, that they knew then that there was no tension on either side of the joint, but that might still be so, and yet the construction might fail from intensity of pressure, with which the middle third, of course, had nothing to do. It was almost impossible to ascertain where the curve of equilibrium would run, the author said. That was so, but there was a natural curve of equilibrium without any conditions of loading, and the shape of the arch should, as far as possible, conform to that curve. It was the inability to conform to it with a rolling load that necessitated the pivot arches. With regard to the settlement of arches, it was most important to have rigid abutments and thin joints, otherwise settlement must take place, and alteration in the distribution of pressure would follow. Mr. Wells described a bridge where lead was used in the springing in the centre. It had, he had thought, been practically decided by architects, who had tried it frequently in the case of stone columns made in pieces and heavily loaded, that the lead was subject to a pressure that might be described as like a hydraulic pressure, which caused a spreading or spalling of the stone at the joint. In the case mentioned by the author, the lead was kept well within the outline joint, no doubt for that reason, and with probably no danger to the joint. He thought Mr. Wells was a little out in his figures with regard to the mortar in the joints in the case of a granite arch being one -twentieth of the crushing strength of the stone itself if made of lime, and quarter the strength if cement grout were used. According to his information, the figures for the crushing strength of granite were from 1,500 to 2,00 tons per sq. ft., while grey lime mortar was only from 5 to 15 tons. The greatest stress in an arch often occurred when only half the span was loaded, unless it was pivoted. The author said that if the span were loaded with 2cwt. per sq. ft., the maximum stress would not exceed 24 tons per sq. ft. He seemed to speak of a load over the whole bridge as giving a maximum stress, but probably half the load over half the bridge would give a greater maximum stress, owing to the distortion of the curve of equilibrium when there was no pivoting at the ends. The settlement when the centres were struck was mentioned, and he would like to enquire from the author whether he had found any difficulty from the settlement of the arch breaking the connection with the spandril walls. He thought that would be likely to happen. With regard to the testing of models, that was a very interesting thing to do, but personally he did not put much faith in the testing of models; they were, as a rule, stronger than the structure they represented, for various reasons, the principal of which was that the linear dimensions varied directly as the scale, but the sectional area of the members varied as the cube of the scale, so that they did not get the same proportion in strength and size between the model and the real structure unless allowance was made for those points. As to the advantages of Portland stone, they were very well put by Mr. Wells, and he thought that was generally admitted to be, because it was just sufficiently porous to get a good key with the cement mortar. Flint, gravel, and granite were too unabsorptive to be able to get a proper key with the cement.

Mr. CHAS. REID said the interest of the paper which they had heard read seemed to be in the question of constructing bridges of concrete with pivoted joints, but he thought when he came there that he would hear more of reinforced concrete arches. He took it that nearly all the arches which Mr. Wells had spoken about were not reinforced concrete arches at all, but pure concrete arches, made without reinforcement, and pivoted in the way described. That pivoting, as the lecturer had said, had been very highly developed by the German engineer. It allowed of very great economy in the material, and of very flat arches being built, which otherwise could not be done; but those same conditions, he took it, would apply to arches of stone as well as of cement, and the action would be just the same. From many of the designs of reinforced concrete arches which they saw, it seemed to him that the principle there generally was to combine the arch with the abutments, and there were many designs he had in his mind in which the iron reinforcement was carried right down into the abutments and piers, and there made one with the arch, so that it gave a monolithic structure. There were many points of interest in the paper. He had had several structures of ferro-concrete under his charge, and it was very useful to make experiments one's self with the concrete as it went on. He quite agreed with what Mr. Wells pointed out, that the concrete as made now was of such a high quality that there might be much higher stresses put upon it than was usually done. He thought that generally the stresses mentioned by Mr. Wells ranged from 30 to 35 tons in the highest. With regard to putting higher stresses than that on the work, they must remember that, although they might have a test piece that would stand much higher stresses than that, still, in a large structure, they were not at the present moment quite certain that the whole of the material in the structure was of exactly the same character as any one particular block. It was the thing they were all trying for—to get that absolute uniformity in the manufacture of the concrete which was desirable—but he knew very well from his experience that they might have some very good concrete work done one day, and yet on some other day, owing to the weather, or perhaps to the conditions of labour, or what not, the concrete would not be so good. He thought it was much more reliable to test blocks of one foot cube than of four inches, which was often done. He had one interesting experience in testing some blocks or columns. They were about 10 inches sq. and 4ft. 6in. long, and tested as columns. Several of them were made with different kinds of reinforcement, and one or two without any reinforcement at all. They were tested at the School of Technology in Manchester. The reinforced concrete columns broke, as far as he remembered now, from about 230 up to 270, or nearly 300 tons per sq. ft., and, strange to say, the column that was not reinforced at all stood 316 tons per sq. ft., and showed in that respect very much better results than the reinforced columns. There were a good many suggestions as to the reason for that. He was not at the making himself, but the resident engineer he had there explained to him exactly what had taken place, and he thought the reason why the one stood so much more than the other was clear. When they were making a reinforced concrete column or girder of any kind, they had their mould to make, and they had to fix their iron rods with it, and often, as they knew in ferro-concrete structure, the iron became very complicated, and it was very difficult to get the concrete in properly between it. The men rammed all the columns, but those that had the iron in them were not so easy to ram as the one that was without any iron. They had a good plain box, and they could ram as much as they liked, and the result he had mentioned was due simply, he thought, to the fact that the concrete was better rammed in the one case than in the other. He just gave that as an instance of what little things affected the strength of concrete and samples in that way.

Mr. PERCY TOMEY said there was one point that had struck him, and that was that the question of reinforced concrete arches had not had quite as much attention as ordinary plain concrete arches. He had, however, expected from the title of the paper that the plain concrete would have the more attention. If reinforced concrete was an elastic material, as they were supposed to believe, why should they go and put in plain concrete with the pivot? If they were going to have an elastic material in reinforced concrete, it seemed to him they could reduce the thickness of the arch very much, and the question of the extra amount of steel required would not make very much difference.

Mr. HERBERT BROOKS said he wished to ask Mr. Wells whether he had any knowledge of the results of the experiment made a short time ago in Germany with the Dusseldorf Bridge. It was probably known to Mr. Wells that a few years ago—he thought in 1902—the Union of German Portland Cement Manufacturers built an exhibit at the Dusseldorf Exhibition, which included a bridge of a very substantial kind. The bridge was left standing until last year, when it became necessary to clear it away. Having the desire to obtain a practical test on a scale which had never hitherto been obtainable, the Union of German Portland Cement Manufacturers asked the German Government to join with them in providing a substantial sum of money for the purpose of loading up the bridge to breaking point. He was the guest of the Union in Berlin last week, and at a meeting there was thrown on the screen before the close of the proceedings a number of views of the operations in connection with the breaking down of that Dusseldorf Bridge. Unfortunately the time was so short that the details could not be given, and the only statement practically that was made was to the effect that the factor of safety was exceeded 23⅛ times. That was, he believed, the largest practical test which had been made with a concrete bridge, and it would be exceedingly desirable if they could have the actual facts in connection with that test submitted to them. Did Mr. Wells know them? He would like to say how much indebted he felt personally to Mr. Wells for the exceeding pains he had taken in giving them that most interesting and useful lecture. Before leaving Berlin he met several members of the Executive Committee of the German Concrete Union, one of whom, knowing he was an Englishman and was connected with these matters over here, alluded to what he had heard of the recent formation of the Concrete Institute here, and said how exceedingly glad the German Concrete Union would be to exchange information and to report upon tests, and exchange results of all practical tests which they were making in various branches in ferro-concrete work in Germany with this new body that had arisen over here, and how glad they would be to welcome the members of the Concrete Institute to their annual meetings, and to exchange information and visits with them. He (Mr. Brooks) took that first opportunity of conveying to the Concrete Institute that message, which was exceedingly friendly, and he was sure it was given, not merely out of professional friendliness, but also out of a desire to manifest the spirit which had certainly become much more noticeable in Germany to Englishmen who went over there since the King's recent visit, which had done so much to improve the relations between the two countries.

Replying on the discussion, Mr. E. P. WELLS said that as to the question of engineers not liking concrete for retaining walls, he had known of cases where they would not use it for retaining walls at all. There were a great many retaining walls put up even now, with nothing but brickwork, the only concrete in them being simply the foundations, where it was a question of going down to depth. He was not surprised at that when he remembered some of the concrete he had seen put in. In reference to a remark made by Prof. Adams about the lead spalling, in the case of the Kirchheim Bridge, it was put in in short lengths, with a space of 3 to 4 inches between each piece of lead, so that it was perfectly free to move in every direction until it came to its true bearings, but the pressure per sq. inch on the lead was not sufficient to cause any spreading. If they got a good hard lead it was safe to do it, but if they got a soft lead and put 1,500 to 1,600 lbs. pr sq. inch pressure, they would find that it would squeeze slightly. With reference to the settlement of an arch made in connection with spandril walls, he had never known such an instance; it was the pivoting that prevented it. With regard to Portland stone cement, he experimented with that 10 or 11 years ago very largely indeed, but if they wanted to get an excellent concrete they must soak their stone in water first, then mix their sand and cement, dry it, dump the wet stone in that, mix together, and add water as required. They would then get an absolutely perfect concrete. In reference to reinforced concrete arches, that was a matter for future treatment, but that evening he was speaking especially of plain concrete arches, for which he had a greater liking, particularly for large-span arches, where there was heavy traffic, as there was an absolute absence of vibration, they carried enormous loads, and architecturally they were very much to be preferred. They could make a handsome bridge with plain concrete, whereas it was most difficult with an ordinary reinforced arch to make it look well. If they put ornamentation, they were condemned, and if they left it absolutely plain people said: "What a beastly ugly thing," but with a plain concrete arch they could put very little ornament, and yet it looked a fine structure. With regard to testing pieces only, the builder of the Vermier dam cut down right into the heart of the dam, and found that the concrete crushed at 360 tons per sq. ft., which was a greater strength than he would have got with the ordinary test cubes. With reference to the plain concrete column mentioned by Mr. Reid, he was not at all surprised that the non-reinforced carried more than the reinforced. It, however, was a matter for further discussion. He was a great believer in pivoting an arch, and they could put it in a reinforced arch. With reference to Mr. Brooks's query, he knew nothing about the experiment with the Dusseldorf Bridge. He was not surprised that the factor of safety was exceeded 23½ times. The proportion that the Germans used in concrete bridges—the test they got—was generally about 450 tons per ft. at two months old. If they waited for a number of years, taking the working stress they put on at about 20 tons per ft., it was easy to see how they got a 23½ factor of safety. No one knew very much about concrete at present, because the experiments had not been carried over a sufficiently long period, and when they were made they were very often made with different kinds and makes of cement, with different men doing it, instead of all being made simultaneously by the same men with the same makes, in which case they could arrive at some definite result.

The CHAIRMAN said the paper had been most interesting and valuable. He thought Mr. Wells had been rather hard on the railway engineer. He happened to belong to that much-abused class, and for his own part he had used concrete for foundations and piers of bridges and abutments for many years back. From the outward appearance, he had a feeling against the face of a concrete abutment, however. It was invariably streaky—some vertical and some horizontal—and he covered up his concrete by facing it with brindled or blue blocks. In the Great Northern, on the heavy clay lines, where retaining walls were required to be of the best, they were always of concrete, but he must confess that they were hidden up in the way he had described. There was one thing he must say about arches, were they of brick, stone, concrete, or reinforced concrete, to the railway engineer and the man who had to maintain things afterwards, they were always preferable to steel, where there was a constant maintenance expenditure going on, probably equal to a fair interest on the capital expenditure, and were it for no other reason than that, he for one should always encourage and support any means by which they could get structures other than metallic structures for purposes of that sort. In conclusion, he moved a hearty vote of thanks to Mr. Wells for his extremely valuable paper.

CONTRACTOR AND SUB-CONTRACTOR.

The position of the sub-contractor has been considerably strengthened in consequence of the action that has been taken by the Tees-side and District Master Builders' Association, who have persuaded the Hartlepool Corporation, and other bodies as well as many architects, to approve of the terms of a new form of agreement between the principal contractor and the sub-contractor. The main provision in this form is said to be as follows:—"The contractor will pay for the work hereby agreed to be done in the manner following. The contractor will, on receiving payment of any certificate in which a sum is allocated to the said work, forthwith pay the sub-contractor the sum so allocated and received by him. On receiving payment of any interim certificate in which no sum is allocated to the said work, the contractor will forthwith pay to the sub-contractor such a sum as will with any previous sum or sums paid on account, make up (a percentage to be agreed upon) of the value of the said work executed at the date of the giving of such certificate, and on receiving payment of the final certificate the contractor will pay to the sub-contractor the balance due in respect of the work. Whenever the contractor is entitled to receive a certificate on account of work done under the said contract he shall, before applying for or immediately on receiving the same, if such certificate has not been applied for, give notice to the sub-contractor in writing that he is about to apply for or that he has received a certificate, as the case may be." The agreement, it will be seen, if generally accepted, will place the sub-contractor pretty much on an equality with the principal contractor, and will make his position more secure.

CONCRETE AND STEEL CONSTRUCTION AT THE SELFRIDGE STORES.

By S. Bylander.

(In previous issues we have described the most interesting methods used in the construction of the Selfridge Store. We dealt extensively with the fireproofing in the fire-resisting construction section of March 17th. We continue the description of the foundation work and steel work. The description of the ferro-concrete flooring, ventilation, heating, artesian well machinery, etc., will be resumed in the next concrete and steel section. As the steel construction work is a principal feature of this building, we are glad to be able to reproduce here several drawings and photographs which the contractors, Messrs. Waring and White, have courteously placed at our disposal. We are also much indebted to the contractors' engineer, Mr. S. Bylander, for his courtesy in affording the architectural and engineering profession a detailed description of the interesting work that has been carried out on this remarkable building.—Editor.)

Reinforced Retaining Wall.

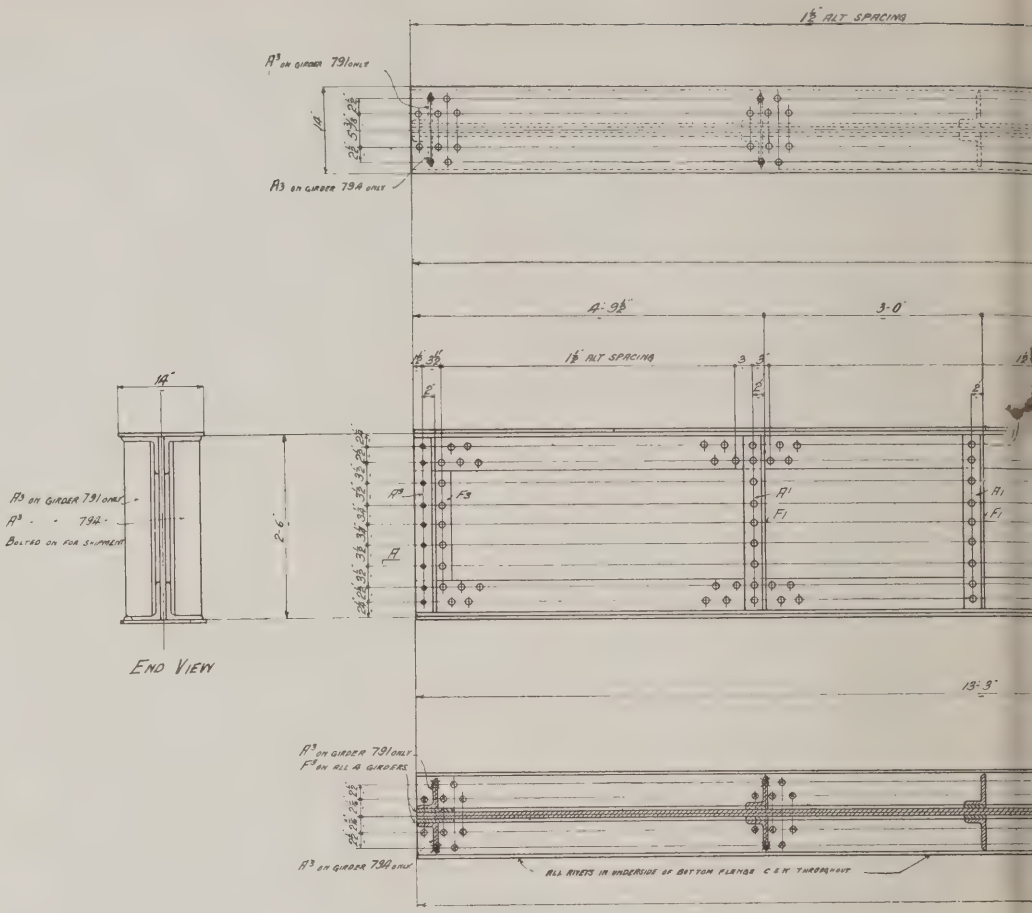
A reinforced wall, 60ft. deep, was built to retain the earth and street, opposite that portion of the building which has three basements. The magnitude and difficulty of the work of construction may be realised when it is considered that a trench next to the street, with four-storey buildings opposite, 40ft. away, had to be excavated 25ft. wide, 100ft. long, and 60ft. deep. The timber work for the strutting was in itself a complicated part of the work. Arrangement had to be made for placing in position 6-in. channel-iron and 1¼in. bars, 40ft. long, for the reinforcement of the wall. The difficulties of constructing a reinforced retaining wall increase very rapidly when the height exceeds 30ft., because reinforcing bars cannot be obtained in one length, the placing of reinforcement becomes difficult, and the thickness of the wall must be great in order to reduce the amount of reinforcement required, and also to reduce the stresses on concrete, as the "actual" stresses in concrete of great thickness and formed quickly are somewhat uncertain. If the reinforcing bars at the back of the wall are placed too close together, it is difficult to fill in the concrete, and the concrete at the back of the reinforcement is liable to chip off and destroy the bond between the concrete and the bars. However, with the use of channels and alternate spacing of bars, no difficulty was experienced, and the wall was rapidly built and has retained the earth perfectly, without showing any sign of weakness. The wall is of uniform thickness, and no buttresses or counterforts are used.

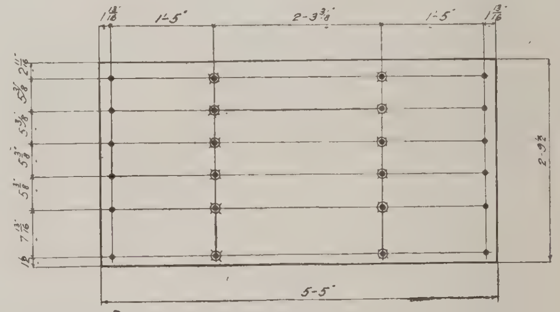
In order to provide for the stability of the retaining wall, and also to form a foundation for the piers of the exterior wall, the base or toe of the wall was made 25ft., and so proportioned that the load on the ground is about the same under the toe of the wall as for the other foundations.

On account of the great height of the wall bars could not be obtained in one length for the main reinforcement, and it was not thought advisable to entirely thrust the overlap of two bars placed on the tension side of the wall. For this purpose light channels were used, which were bent and spliced with fishplates, thus forming a continuous and reliable main reinforcement where the greatest stresses occurred. The load from the piers was spread with one layer of grillage beams and the base of the wall, which is a continuous slab, is reinforced with 1¼in. Indented steel bars top and bottom. The back and front of wall is reinforced with ¾in. Indented steel bars placed horizontally to prevent shrinkage cracks.

All the other retaining walls were built in ordinary concrete. The formula for all retaining walls was one cement, two sand, and four gravel, mixed in a batch mixer.

A ¾-in. thick asphalte damp-course was placed at the back of retaining walls and





MAKE 2 PLATES 1" THICK AS SHOWN MARKED F791ᵃ F791ᵇ

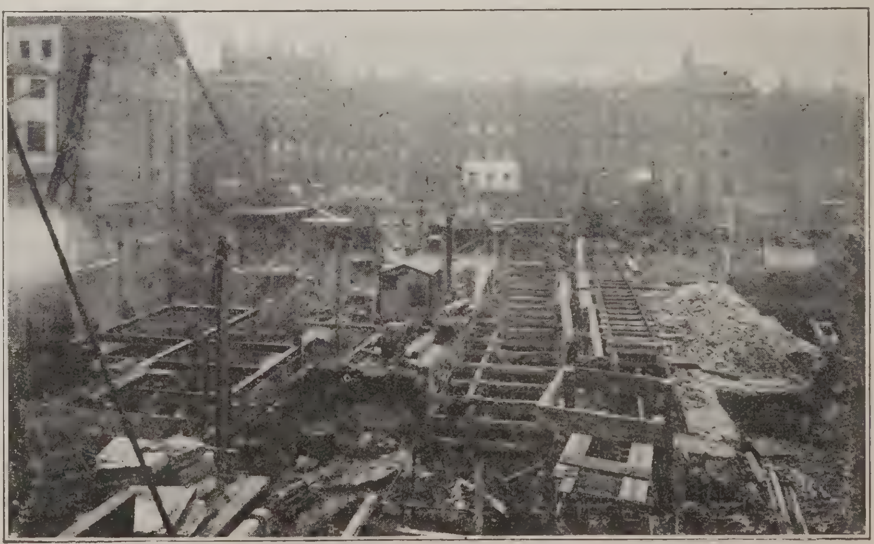
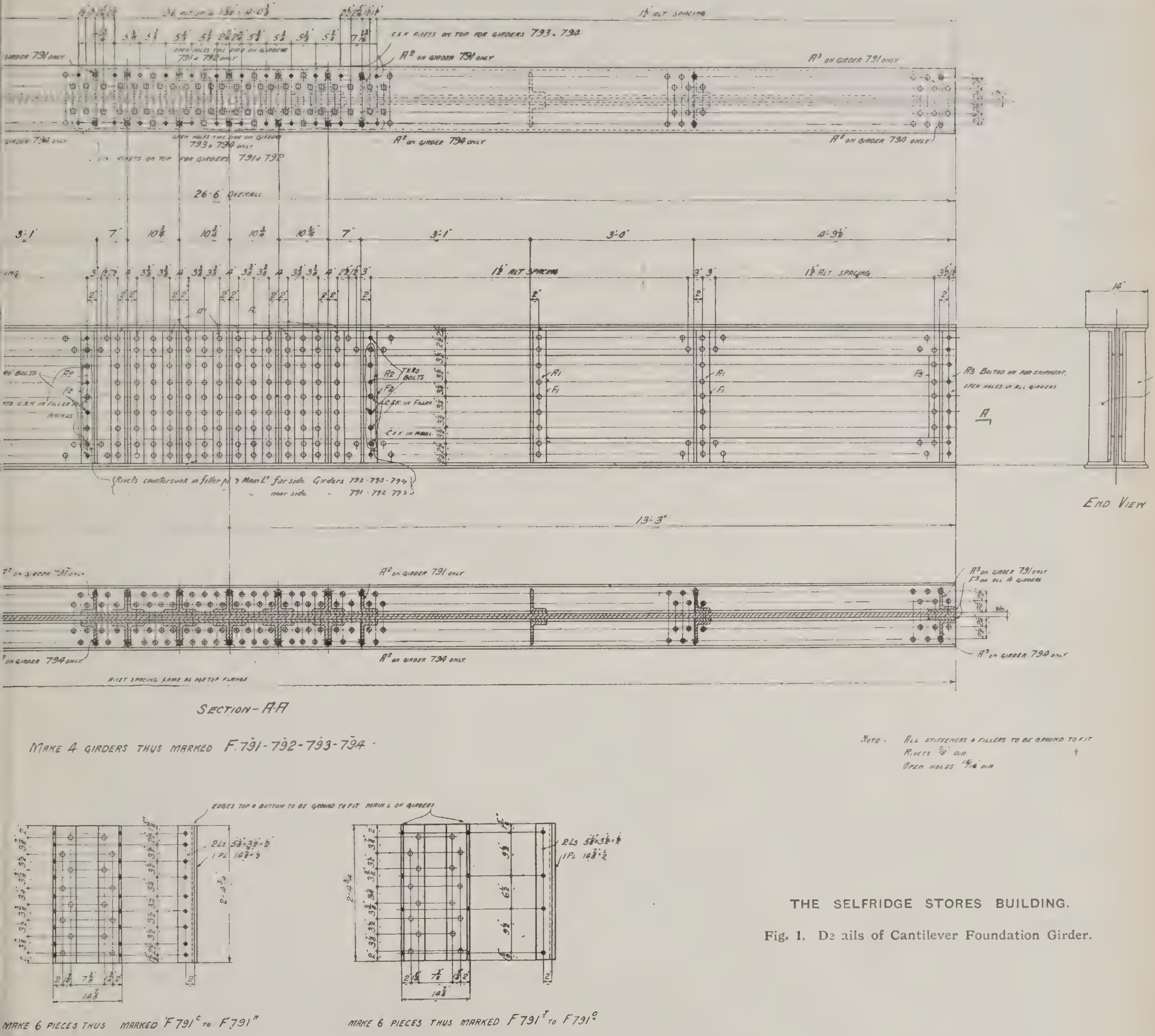


Fig. 2. Trench for centre party wall and track for travelling crane.


C.S.K. rivets on top for girders 793 - 794
A² on girder 791 only
A³ on girder 791 only
A² on girder 794 only
A³ on girder 794 only
Open holes this side on girders 791 & 792 only
Open holes this side on girders 793 & 794 only
Rivets on top for girders 791 & 792
1½" alt spacing
26-6" overall
13-3"
Thro bolts
C.S.K. in filler
C.S.K. in angle
A3 Bolted on for shipment.
Open holes in all girders
Rivets countersunk in filler pl & main L for side girders 792 - 793 - 794
near side 791 - 792 793
End View
A³ on girder 791 only
F³ on all 4 girders
A² on girder 791 only
A² on girder 794 only
A³ on girder 794 only
Rivet spacing same as for top flange
Section-A-A
Make 4 girders thus marked F.791-792-793-794.
Note. All stiffeners & fillers to be ground to fit
Rivets ⅞" dia.
Open holes 15/16" dia
Edges top & bottom to be ground to fit main L of girders
2 Ls 5½ × 3½ × ½
1 PL 14⅞ × ½
Make 6 pieces thus marked F791c to F791h
Make 6 pieces thus marked F791j to F791o

THE SELFRIDGE STORES BUILDING.

Fig. 1. Details of Cantilever Foundation Girder.

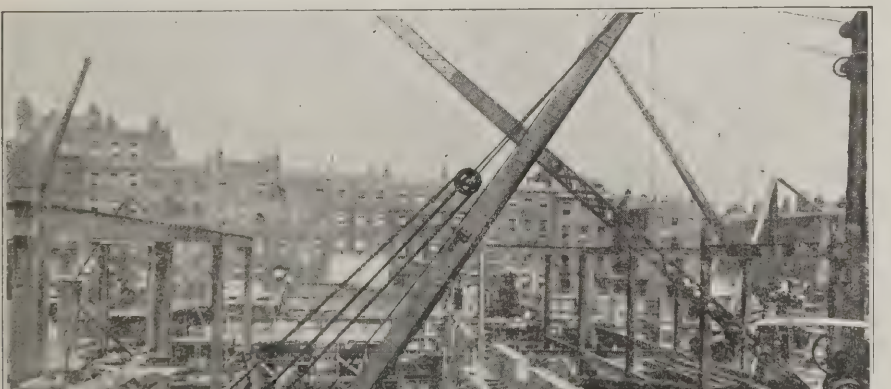


Fig. 3. Showing rise of centre party wall.

under all foundations, and what is practically a watertight concrete tank was formed for the basements.

The excavation for the retaining walls was made before the dumpling was taken out. A view of the strutting for one of the trenches is shown in Fig. 2. This illustration also shows the track for the travelling crane, as well as part of the steelwork erected in the third basement. In Fig. 3 is shown the same part of the building at a more advanced stage of construction.

Underpinning.

The contractors proceeded with the underpinning of the walls of the adjoining buildings quickly and systematically. Pits were excavated in lengths of 6ft., and in width from 10ft. to 14ft., to suit the foundations. The new wall was built in piers, and was finally completed before the excavation of the site was carried out.

The underpinning of the walls, erection of retaining walls, excavation, and putting in of grillages and foundations, were executed very quickly and efficiently in spite of great difficulties. For instance, in one case it was necessary to prepare a scheme for the underpinning of a five-storey building above

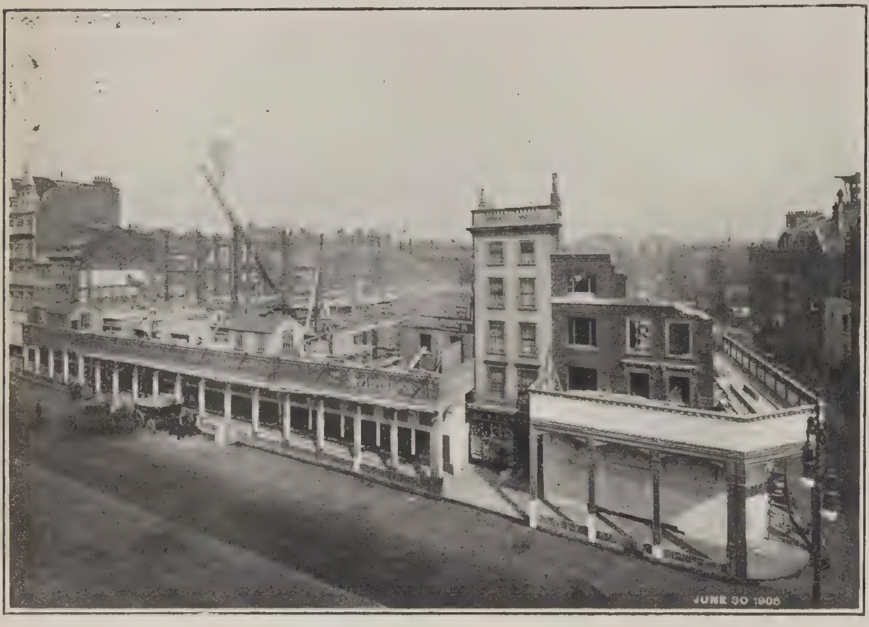


Fig. 4. View from Oxford Street.

the ground (in addition to the basement), and having about 20ft. frontage to Oxford Street. Fig. 4 shows a view of this building. The procedure was as follows:—

Temporary foundations were put in clear of the foundations for the new building, and were prepared for carrying large girders about 30ft. long, one on each side of the old walls, which girders would carry the needle beams through the walls of the old building; the needle beams being placed in the basement of the old building sufficiently high to permit the new foundations to be put in while the upper part of the old building remained perfectly undisturbed. As Mr. Selfridge got permission to pull down the old building before the foundations were completed, the scheme was not carried out.

The remarkable rapidity with which the building was erected may be observed from the successive photographic reproductions shown by figures 4 and 9, which were taken respectively on August 17th, 1908; and September 17th, 1908.

Steelwork.

The method of setting out the building and the placing of the columns has been dealt with in a former issue. It is further illustrated by Figs. 5, 6, and 7, which show part of the framing plans of the various floors.

One particular feature of this building is the regular and economic setting out. Practically all panels are alike, permitting a great deal of repetition work. The columns are spaced 22ft. to 24ft. centres. The floor girders are spaced 12ft. centres. There are no columns in the exterior walls; the loads are carried on blue-brick piers. An exception is made on the first floor plan (Fig. 5), where column 71 and 72 have been introduced for the purpose of underpinning the old building previously described. Beams 20in. deep have been extensively used. The method of showing the framing and working of the different parts is shown on the plans.

Every piece has a separate identification number, so that there should be no confusion during erection. The works of the columns are shown in a circle, and the work of beams and girders is shown in a bracket, thus: (122). In addition to this number, the piece is marked in the shop before leaving for shipment, while an additional work indicates for which floor the piece is required. For instance, Beam 122, in the 1st floor framing, is marked: I F L 122.

The levels of beams below floor level is given thus: [10ins.].

The design of the steelwork foundations and retaining walls has been made by the engeering department of Waring and White, Ltd. This firm has also carried out the erection of the steelwork, as well as the general contract. They have made their own shop drawings for the mill. Their supervision of the work from start to finish, and the adoption of a uniform method of working throughout, resulted in quick and good work at low cost. Every detail of the work has been standardised, and all work has been carried out systematically, in such a manner that responsibility could always be traced to the right person, and the progress of the work carefully watched.

In all, about 3,000 tons of steel has been erected, in addition to about 350 tons of bars for reinforced concrete work. The steelwork was erected at a rate of about 125 tons per week, and was completed in less than six months.

The number of drawings for the steelwork foundations and mechanical equipment was very large. These were prepared by Messrs. Waring and White. In all about 12,000 prints were made, of which about 2,500 were 40ins. by 27ins. Only by making complete drawings and preparing complete instructions could the work be carried out satisfactorily.

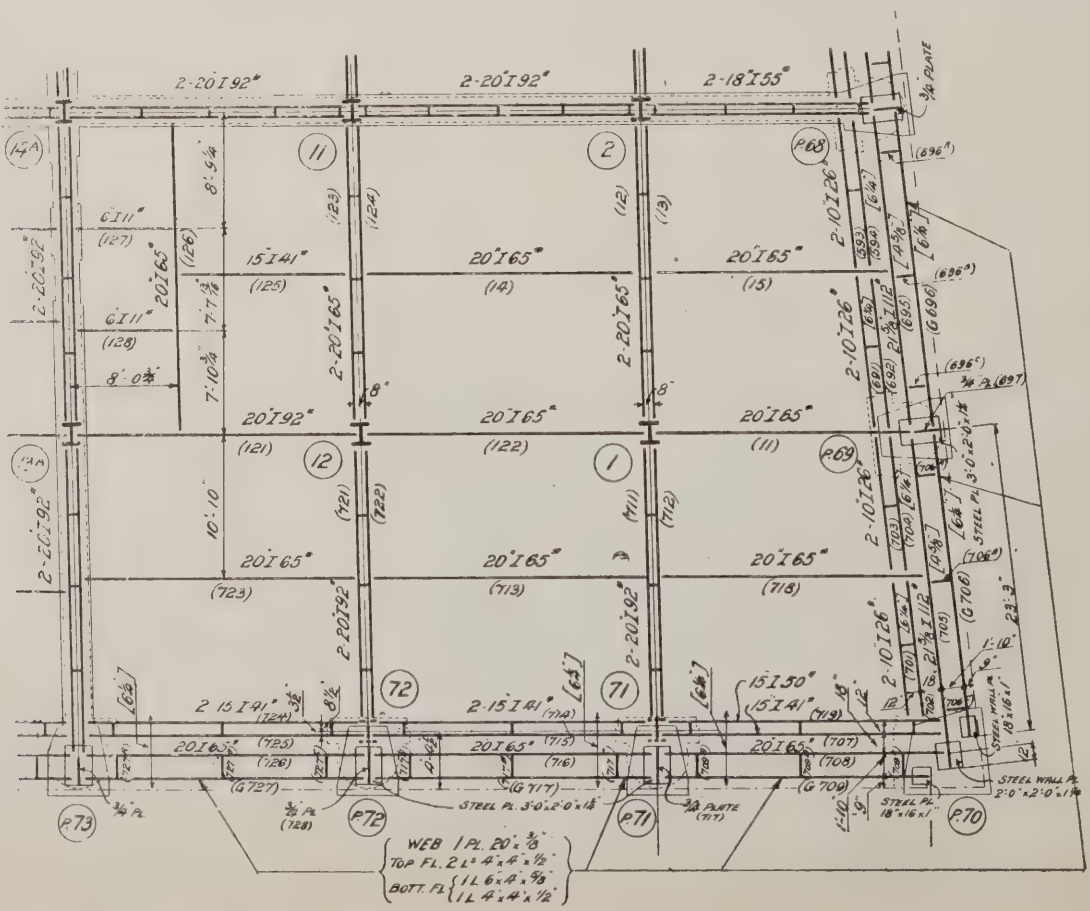


Fig. 5. Part of first floor framing plan

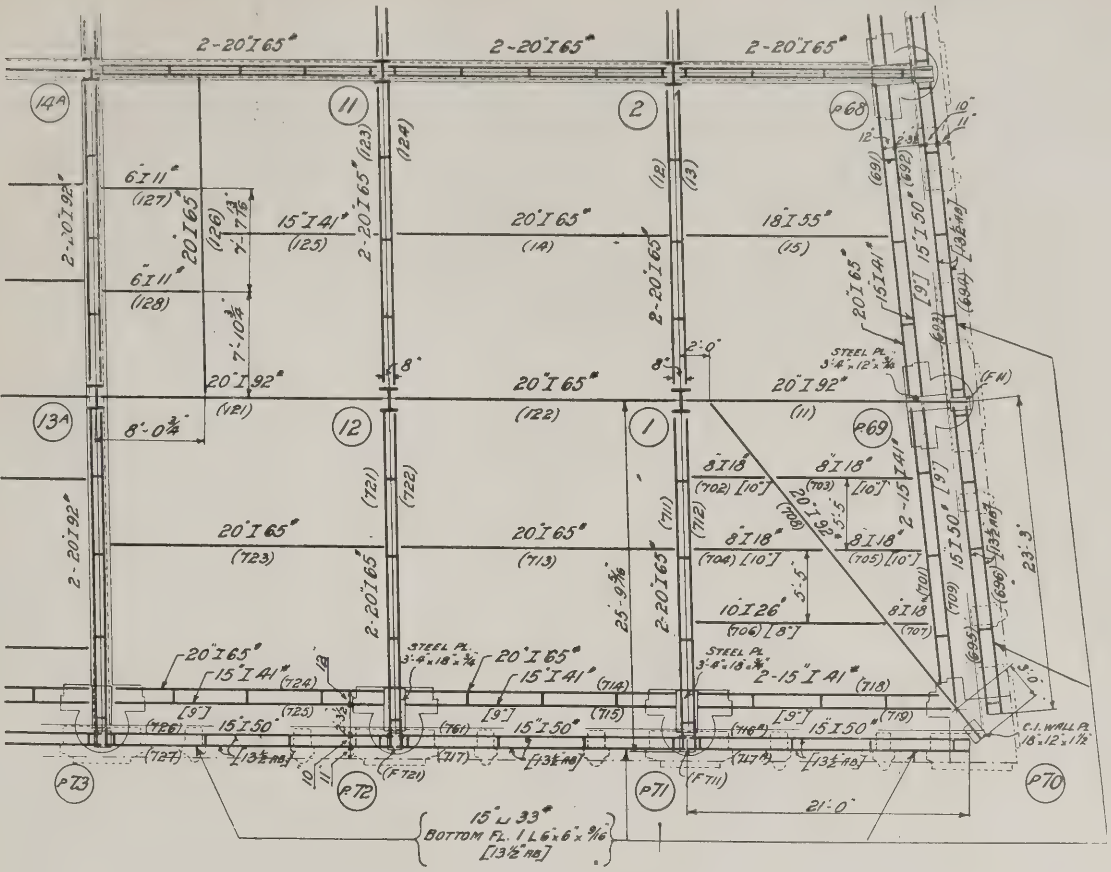


Fig. 6. Part of Fourth Floor Framing Plan.

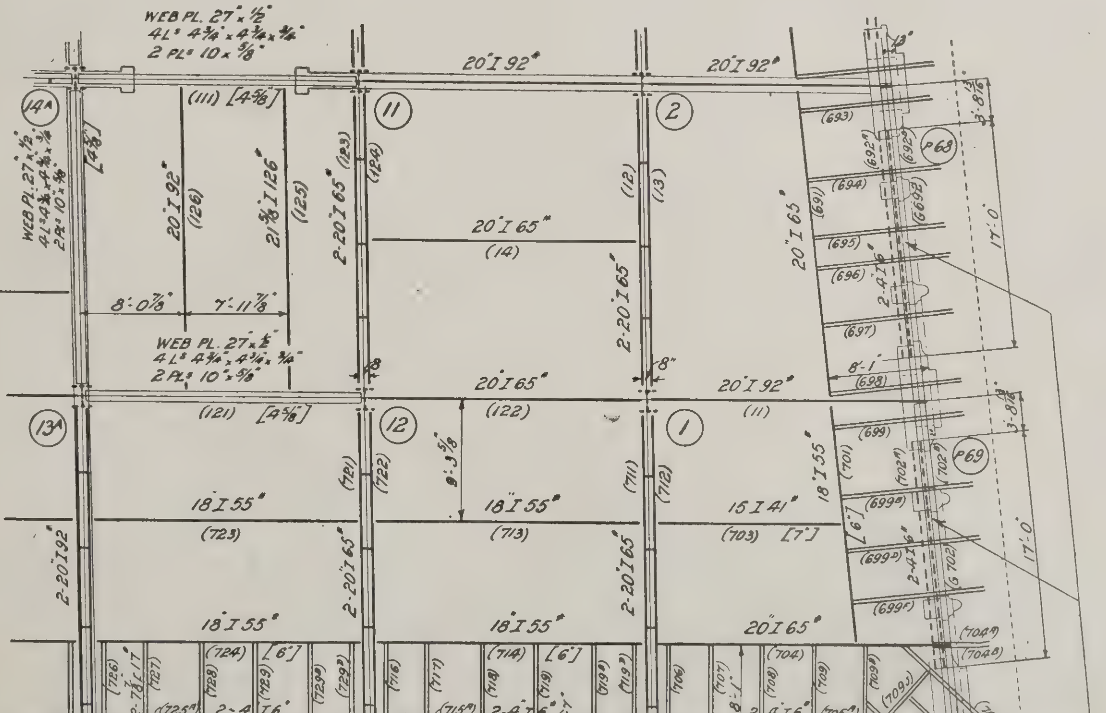


Fig. 7. Part of Roof Framing Plan.

THE SELFRIDGE STORES BUILDING, OXFORD STREET, LONDON.

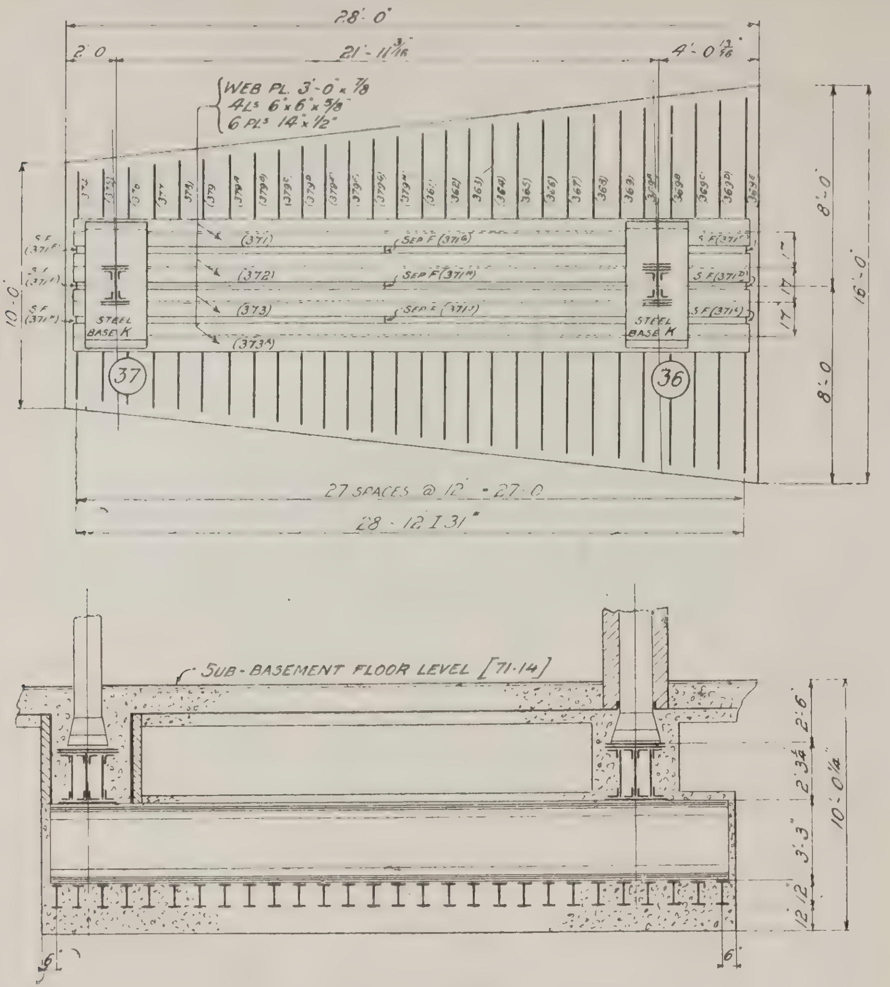


Fig. 8. Grillage for Cantilever Foundations.

Every steel piece was inspected in the shop, and compared with the detail shop drawings. The quality of all material was carefully tested, and the loading and transport were supervised. The finished material was marked as follows:—1, sign of approved material; 2, sign of approved workmanship; 3, identification numbers; 4, blow or melt number. Steelwork for different floors or different parts of the building was painted with distinguishing colours. The inspector was resident at the place of manufacture, and acted as the representative of the engineer.

The position of holes and lines of cutting, etc., was set out on the steel from the detail drawings, without the assistance of templates; and the different steel pieces were not fitted together in the shop, but were simply made to drawings, and were found to fit perfectly when erected.

The erection cranes for the steelwork on the site were supported on the steel frame, and raised from floor to floor as the erection proceeded. The tower gantry was not used.

Grillages.

The size of the foundations was so proportioned that the load was uniformly 5,000 lbs. per sq. ft. In some cases, on account of adjoining property, cantilever construction was adopted, as shown in Fig. 8. The shop detail for the plate-girder is shown in Fig. 1. These figures also show the method of dimensioning general drawings and details. Cast-iron bases were generally used under the columns.

Finishing Works.

It may be of interest to mention that the ceilings and walls are finished in plaster throughout, with the exception of the National, the Reading, the Rest, and the Writing Rooms, the last three being panelled in dark oak. The walls, generally, at present are tinted white. It affords some idea of the size of the building, when it is stated that Veronese, Ltd., of Fulham, S.W., supplied no less than 7 miles of 30-in. girt cornice to the building, and this large order was actually executed in 12 weeks, in order to assist Messrs. Waring and White, Ltd., to "break the record" in the erection of the building. The shop fixtures, counters, etc., are almost entirely in mahogany; but what will attract the attention of most visitors is the comparative low height of the fixtures. It is possible to see from end to end of the building, and needless to say the absence of high fixtures, combined with the white plaster walls and ceilings, gives an impression of lightness and brightness to the various floors in the building.

(*To be continued.*)

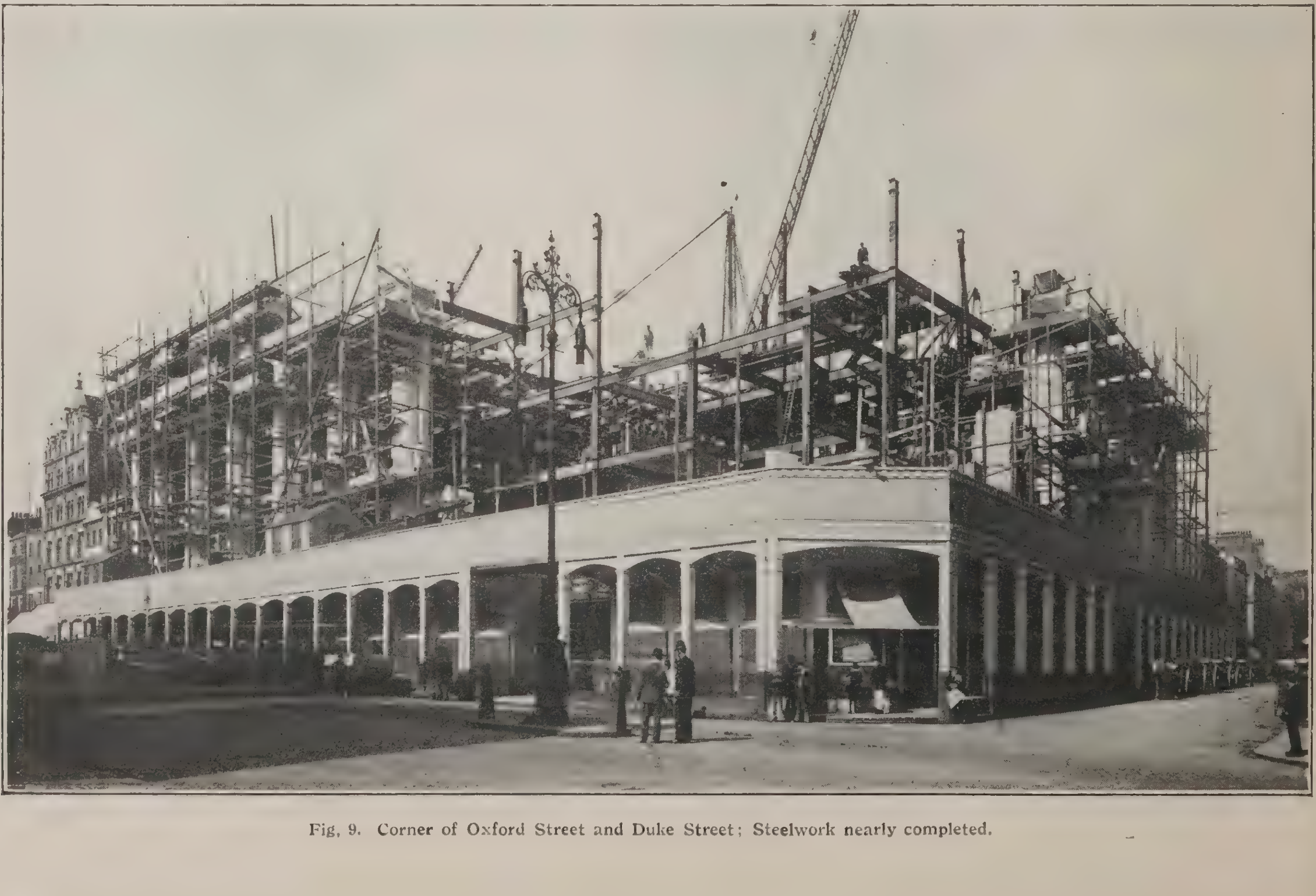


Fig. 9. Corner of Oxford Street and Duke Street; Steelwork nearly completed.

A HUGE TESTING MACHINE.

The recent collapse of the Quebec Bridge, and the serious weaknesses that have been discovered in the design of the Blackwell's Island Bridge, have not only made engineers in the United States fearful of the sufficiency of their practice, but have called attention to the want of data regarding the strength of structural members of large size. Engineers generally wish to have data from actual tests on full-sized members in order either to prove or to modify the current theory on the subject, as also to show what factors of safety are advisable in such large structures. In consequence of this demand for large-sized tests, the United States Government are constructing a testing machine of quite phenomenal size, capable of testing the largest units employed in steel structures that have been built in the United States. The machine is admirably designed as far as we can judge from the information available, and we would specially call attention to the fact that it is arranged vertically, as all machines for compression tests should be. The older type of horizontal testing machine is more economical and easier to work, but it has a great disadvantage in respect to the bending moment that is induced in the material by its own weight. Tests always should be conducted in the exact manner in which the members are intended to be used in practice, and horizontal compression tests do not conform to this requirement except in a few cases of bridge design. This American testing machine will provide the most valuable data, and we look forward with great interest to the tests it is proposed to conduct on it. The following is a short description of the machine.

The testing machine will be of 10,000,000lbs. capacity, and is now under construction by Jinius Olsen and Co., of Philadelphia, for the Structural Materials Testing Laboratories of the U.S. Geological Survey, under the direction of Mr. Richard L. Humphrey, engineer in charge of the laboratories. The machine was primarily acquired for the purpose of studying the effects of flaws and defects of various kinds in large blocks of natural stone, data on which were requested by the supervising architect of the U.S. Treasury Department. In order to meet a further request from the Supervising Architect for data relative to the strength of columns of brick, concrete, and structural steel, the original clearance between heads was increased from 25ft. to 65ft. Some idea of the great size of the machine may be gained from the accompanying illustration, in which has been sketched one of the chords of the Quebec Bridge, and also a larger chord which was used in the Blackwell's Island Bridge. The machine will be capable of testing built-up structures of even greater size than those shown.

The machine is a large hydraulic press, with one adjustable head, and a weighing system for recording the loads developed in it by means of a triple-plunger pump. It has a maximum clearance between heads of 65ft.; the clearance between screws is a trifle over 6ft., and the heads are 6ft. square. The extreme height above foundation is 80ft., and the gross weight over 200 tons.

The machine consists of a base containing the main cylinder with a sectional area of 2,000 sq. in., upon which rests the lower platform or head, which is provided with a ball and socket bearing. The upper head is adjustable through four vertical screws, 13½ins. in diameter, and 72ft. 2ins. long, by means of gearing operating four nuts with ball bearings. The shafting operating this mechanism is connected with a 15-h.p. 200-volt variable-speed motor, which operates the triple-plunger pump that supplies the pressure to the main cylinder.

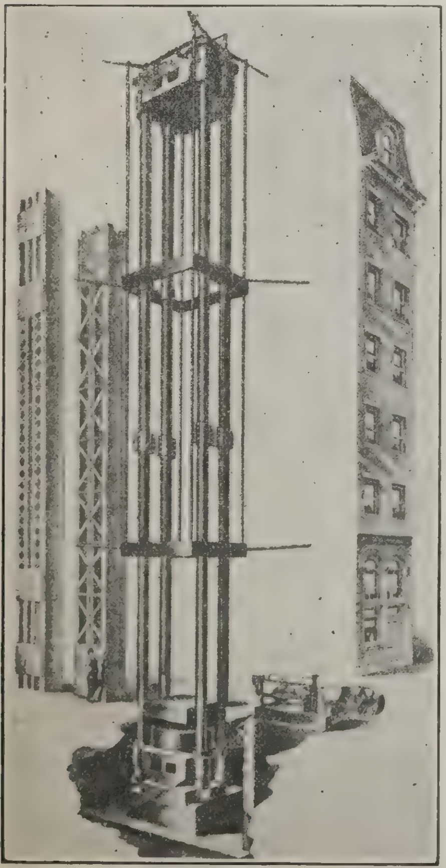
The weighing device consists of a set of standard Olsen levers, upon which is weighed 1-80 of the total load on the main cylinder. This reduction is effected through the medium of a piston and diaphragm. The main cylinder has a diameter of 50ins., and the smaller a diameter of 5 9-16ins. The weighing beam is balanced by an automatically operated poise weight, and is provided with a device for applying successive counter weights of 1,000,000lbs. each. Every division on the dial is equivalent to 100-lb. loads; smaller divisions are possible by means of an additional needle beam.

The extreme length of the main screws necessitates splicing, which is accomplished as follows: In the centre of the screws at the splice is a 3-in. threaded pin for the purpose of centering the upper and lower screws; this splice is strengthened by means of split sleeve nuts, which will facilitate the removal of the sleeve nuts whenever it becomes necessary to lower the upper head; after the head has passed the splice the sleeve nuts are replaced.

In order to maintain a constant load a needle valve has been provided, which will allow, when the pump is operated at its lowest speed, a sufficient quantity of oil to flow into the main cylinder to equalise whatever leakage there may be. The main cylinder will have a vertical movement of 24ins.

The speed of the machine for purposes of adjustment, using the gearing attached to the upper head, is 10ins. per minute. The speed for applying loads, controlled by the variable-speed motor driving the pump, will vary from the minimum of at least 1-60in. per minute, to a maximum of at least ½in. per minute. The contract provides that the machine shall have an accuracy of at least one-third of 1 per cent. for any load over 100,000lbs. up to the capacity of the machine.

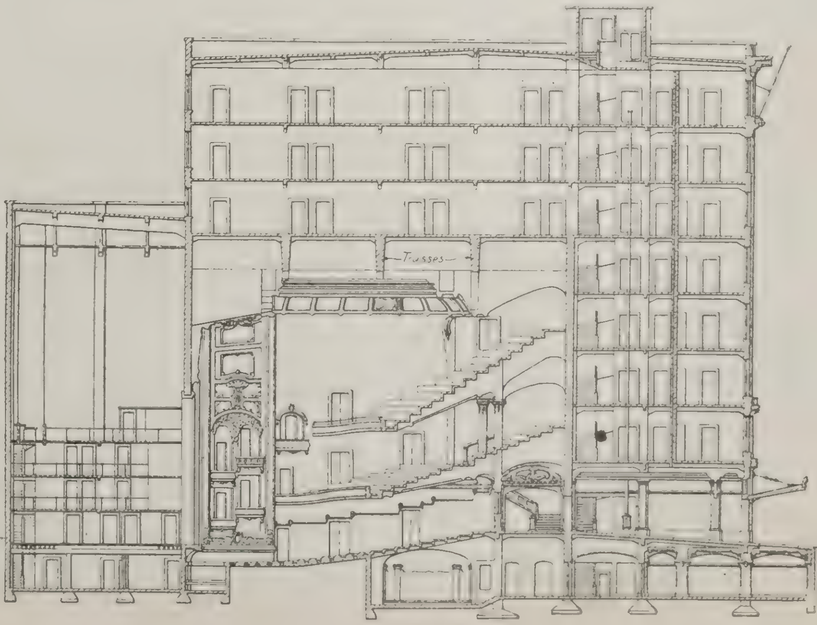
The size of the machine may be judged from the weight of its principal parts. The castings for the base and the top head weigh approximately 50,000lbs. each, each main screw over 40,000lbs., the lower platform about 25,000lbs., and the main cylinder 16,000lbs. The top of the machine will be about 70ft. above the floor.



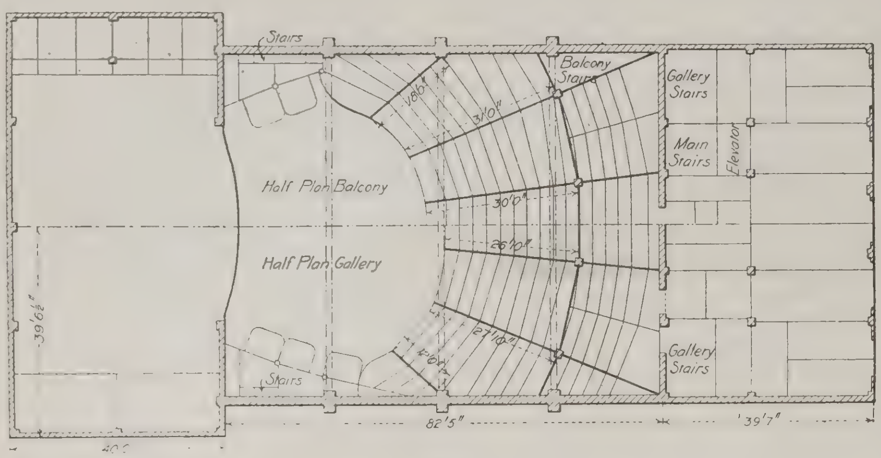
A GIANT TESTING MACHINE.

A THEATRE IN REINFORCED CONCRETE.

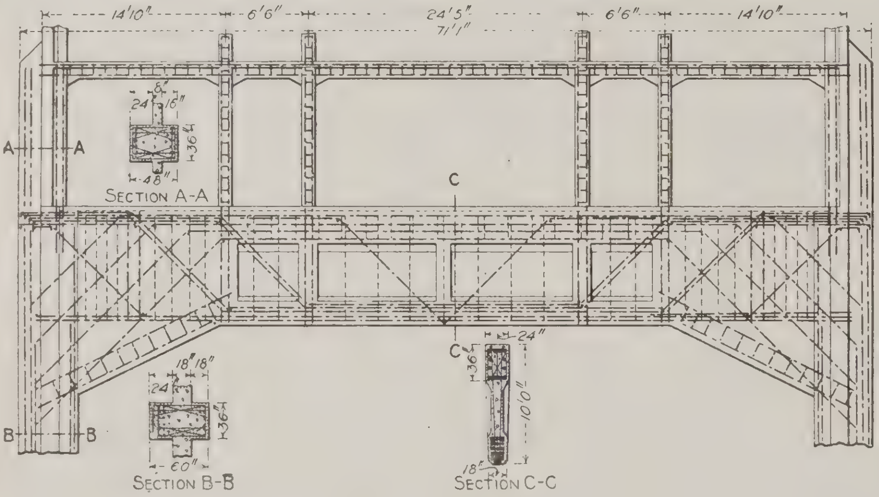
Details are given in the "Engineering News" (New York) of February 11th of a bold piece of construction in connection with a theatre and office building recently erected at Los Angeles, California. The most noticeable features in this edifice, which is built entirely of reinforced concrete, are the cantilever balconies in two tiers, and the three trusses across the auditorium. The roof beams have a span of 71ft. from wall to wall, and carry three floors of office buildings above them, all constructed in steel and concrete. The beams are 10ft. deep in the centre with horizontal chords. They are 24in. wide at top, 18in. wide at bottom, and are calculated to take a load of 375 tons. The steel reinforcement in the upper member consists of 12 1¾in. square twisted bars, with 15 1⅝in. square twisted bars in the bottom member. The largest cantilevers of the gallery and balcony are 27ft. and 30ft. in projection respectively; both of them have, therefore, the greatest known projection of any reinforced concrete cantilevers in existence. The balcony is supported by six of these cantilevers, giving a free overhanging of 30ft. The two side cantilevers are brackets 18ft. long coming off the truss columns on either side of the auditorium. The four great central cantilevers, two of which are 45ft. long, and two



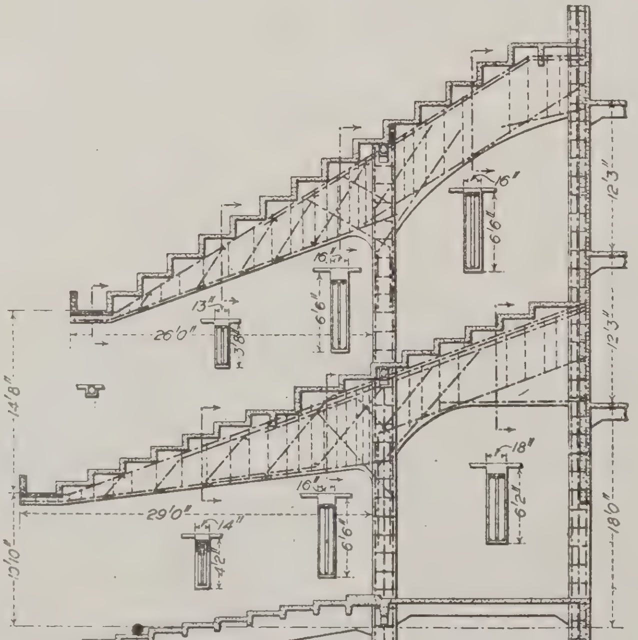
THE MAJESTIC THEATRE BUILDING, LOS ANGELES. SECTION



Plan.



Detail of a Main Truss over Auditorium.



Detail of Central Cantilevers of Balcony and Gallery.

THE MAJESTIC THEATRE BUILDING, LOS ANGELES.

51ft. long, project 29ft. and 31ft. respectively, and are supported on independent columns which are placed in the curtain wall between the main floor of the auditorium and the foyer. These cantilevers vary in section from 10in. wide to 12in. deep, at the outer end, to 18in. wide by 78in. deep at the maximum section, over the column support, and are reinforced with seven 1⅜in. square twisted steel bars on the tension side, extending through the anchor arm into the rear wall. On the compression side are three 1in. square twisted bars. Both the gallery and balcony were designed to sustain a superimposed load of 125lb. per square foot (the metal work at 20,000lb. per square inch, and the concrete at 500lb. per square inch). In the testing of the gallery a load of over 270lb. per square foot was placed directly over one cantilever, and the deflection at its end was only 3-16in. The maximum possible load with every chair occupied is estimated 50lb. per square foot, making no allowances for passages.

STANDARD SPECIFICATION FOR FERRO-CONCRETE.

A specification for works to be executed in reinforced concrete specifically intended for use as a standard for the Hennebique system, has recently been published by Messrs. L. G. Mouchel and Partners, of 38, Victoria Street, Westminster. This calls for no extended review on our part, for the specification is not of general application, though it offers many useful hints for the draughting of specifications for reinforced concrete generally. Many of the clauses are of an ordinary character required for the obtaining of good work. There are a few clauses, however, to which we may call special attention. First, the provision in the specification that the tender shall be a lump sum, is all very well if there are no extras and variations, but there are few jobs where there are no extras and variations. Then the contractor is required to obtain for himself all necessary measurements, levels, and information concerning the site of the works and the nature of the subsoil; furthermore, the contractor is to be held responsible for the accuracy and sufficiency in every respect of the working drawings, which he does not prepare. Surely the engineers responsible for the design should hold themselves responsible for its accuracy, and should supply the contractor with full information. The method of working proposed seems to us neither equitable nor politic. The proportions advocated for the concrete are approximately a 1 : 1⅘ : 3⅗ mixture for columns, beams, floors, and the like, the actual terms being 1 bag cement (224lbs.), 4½ cub. ft. sand, and 9 cub. ft. aggregate; and 1 : 1½ : 3 mixture for work in tidal waters and all piles, the actual terms being 1 bag cement (224lbs.), 3¾ cub. ft. sand, and 7½ cub. ft. aggregate. It is stated that in all cases where the weight of cement per bag is greater or less than 224lbs. the volume of sand and aggregate shall be varied proportionately; but, as the finer a cement is ground, the lighter it weighs, the contractor by such a clause is not encouraged to use a superior cement, for the superiority depends upon the fine grinding. Indeed, with a very finely ground cement a less quantity could be used, and the work would in no wise suffer. A clause is also inserted in this specification for load tests, stating that the load shall be 50 per cent. in excess of the nominal working super load, and how the load is to be applied. The test area for a secondary beam is required to be not greater in length than the distance between two main beams and not greater in width than the distance between two secondary beams, while the area for a main beam is to be not greater in one direction than the distance between any two supports of the main beam, and not greater in the other direction than the distance between two main beams. This is unsatisfactory, for by such a system of loading a considerable portion of the load is transmitted to the adjoining beams, and the actual load on the beam is much less than it appears to be.

REINFORCED CONCRETE SYSTEMS.

The Considere System.

M. Armand Considère is an authority of international repute upon reinforced concrete. When he was Inspector Général des Ponts et Chaussées, from which position he has now retired, he conducted most elaborate experimental and theoretical investigations into the principles and practice of reinforced concrete on behalf of the French Government. He had a large share in the work of the French Ministerial Commission on reinforced concrete. M. Considère has been largely responsible for the present theory which is generally adopted by designers in reforced concrete. His researches have been of the utmost importance, and had a far-reaching influence. M. Considère, after having retired from his official position, has entered the industry of reinforced concrete as a specialist designer, and it is with the Considère system, as comprising his ideas and methods of constructing in reinforced concrete, this article has to deal. We have before referred to his experimental researches, and we have published a communication from him in our columns on the subject of hooped or spirally reinforced concrete and its applications. That subject forms the most striking feature of the "Considère System," which is being worked in this country by the Considère Construction Co., Ltd., of 5, Victoria Street, Westminster, S.W.

M. Considère's discovery of the properties of spirally reinforced concrete date from 1902, when he conducted numerous experiments that showed the great efficiency of such means of reinforcing concrete members subjected to compression. He first communicated his discovery to the Académie des Sciences, in Paris, in notes on August 25th and September 6th of that year. Many experiments have been conducted to ascertain the properties of concrete hooped or spirally reinforced, in the laboratories of the Ecole des Ponts et Chaussées and the Conservatoire des Arts et Métiers at Paris, the Technical High Schools at Stuttgart, Turin and Zurich, and the Artillery Arsenal at Turin. The method of construction has received the official seal of the French Government, for in the instructions issued by the Minister of Public Works to the Engineers of the Department of Ponts et Chaussées, methods for the calculation of the dimensions of spirally reinforced members find a place. Since 1904 spiral reinforced concrete has been employed in many important works, notably in France, Switzerland, Austria, Germany, Belgium, and England.

The experiments conducted for the French Commission du Ciment Armé have shown by a comparison of exactly similar test pieces of concrete, plain, reinforced with longitudinals and ordinary bindings and spirally reinforced, that whereas with the ordinary bindings reinforced concrete gave extremely irregular results, the spirally reinforced was most regular, being unaffected apparently by considerable variations in the quality of the concrete and giving much higher resistances than the other; furthermore, they showed that eccentric loading diminished the resistance but little The formulæ for calculating the resistance were proved by experiments on large and small test pieces, and under varying conditions of execution and quality of material and workmanship, and varying dispositions of the reinforcement. Only a spiral hooping is theoretically necessary to gain maximum resistance, but longitudinal rods of small section are usually provided to convenience the work of construction. The spiral binding acts by resisting the outward bulging or bursting of the columns under load. Spirally reinforced concrete possesses great ductility and elasticity. The external shell of concrete covering the spirals begins to splinter if the pressure exceeds the crushing strength of plain concrete by 30 to 70 per cent., the resistance of the shell increasing according to the percentage of metal. Longitudinally reinforced concrete often *fails* at less than the resistance of plain concrete. The resistance furnished by longitudinal bars is proportional to the shortening they undergo before the concrete in which they are embedded begins to disintegrate; therefore their efficiency depends entirely upon the ductility of the concrete, which is small if the concrete is of poor quality. It follows that longitudinal reinforcing is of little effect in increasing the resistance where the concrete is of bad quality, and therefore most needs its assistance. Spirally reinforced concrete of the poorest quality is capable of undergoing a shortening 20 to 30 times greater than that necessary for producing in the longitudinal bars a resistance equal to their limit of elasticity. The nature of the increased resistance produced by the spirals is comparable to that of the well-known sand-boxes frequently used by contractors for supporting the centering of bridges; its cause is intermolecular friction, which is of identical value for mortar and concrete of any description as for sand; therefore its value is not materially affected by the quality of the mixture.

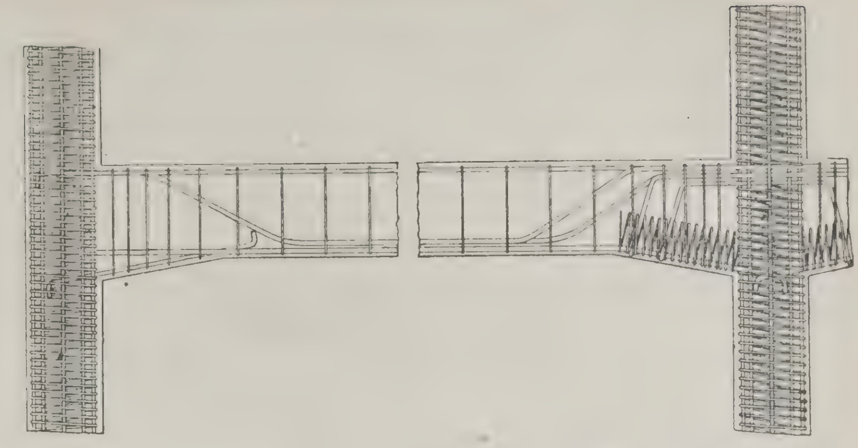


FIG I.—END BAY OF A CONTINUOUS GIRDER: CONSIDERE REINFORCEMENT.

M. Considère gives the following rule for the resistance to crushing of a spirally reinforced prism subjected to pressure at the ends:—

"The resistance exceeds the sum of the three following elements:—

"(1) The resistance to crushing of the concrete itself, increased by 50 per cent.

"(2) The resistance of the longitudinal reinforcement taken at its limit of elasticity.

"(3) The resistance of an imaginary longitudinal reinforcement, taken at its limit of elasticity, the weight of which would be 2.1 times the weight of the spiral reinforcement."

The French Ministerial regulations require in calculations the substituting of 15 volumes of concrete for one volume of longitudinal armouring, and 32 volumes of concrete for one volume of spirals. This means that the 50 per cent. increase in the constant resistance of the plain concrete is ignored. Then there is a further requirement that to avoid cracking of the envelope the pressure must not ex-

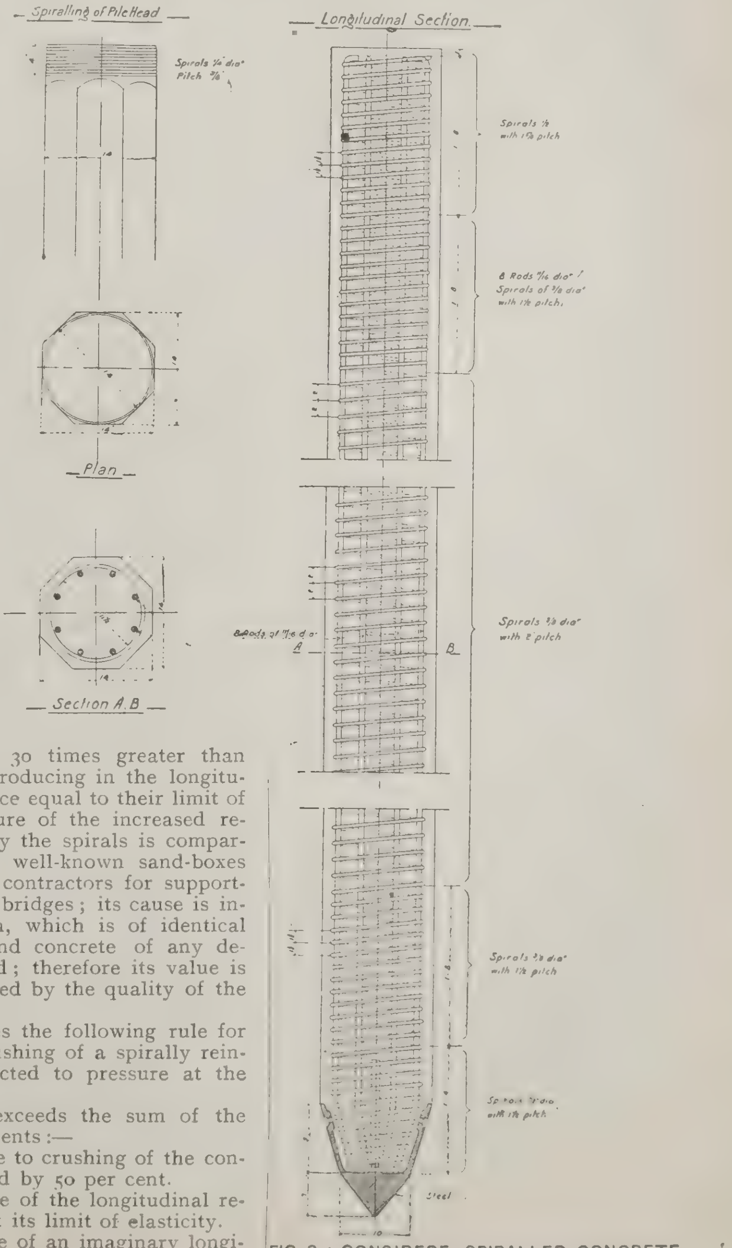

Spiralling of Pile Head
Spirals ¼" dia. Pitch ⅝"
Plan
Section A.B
Longitudinal Section
Spirals ⅜ with 1½ pitch
8 Rods 7/16 dia. / Spirals of ⅜ dia. with 1½ pitch.
8 Rods of 7/16 dia.
A
B
Spirals ⅜ dia. with 2 pitch
Spirals ⅜ dia. with 1½ pitch
Spirals ⅜ dia. with 1½ pitch
Steel

FIG 2.—CONSIDERE SPIRALLED CONCRETE PILES. DETAILS FOR A 40-FT. PILE

ceed 60 per cent. of the crushing resistance of plain concrete 90 days old. Thus the regulations provide for a greater factor of safety than is required for longitudinally reinforced pieces, which is manifestly the opposite of what should be allowed if we regard the superiority of spirally reinforced concrete in respect to its ductility and uniformity.

For further details of the theory of, and experiments on spirally reinforced concrete, the reader is referred to M. Considere's articles in former issues of this journal.

The principle has been applied by M. Considère to the reinforcement of parts subjected to compression in various structures and parts of structures. The advantages claimed for this are a saving in cost, a saving in bulk of material, and a reduction in dead-weight. If continuous girders are constructed in reinforced concrete, the negative bending moments over the supports are of great intensity, greatly exceeding the positive moments at the centres of the span. Moreover, whereas the centre of the beams can be made of T section, so providing a large area of concrete in compression over the supports, the beams are rectangular in section, and though increase of depth is obtained by making brackets overlapping the rods, even then the beams are weak. Therefore, we are accustomed to regard the beams as not truly continuous, and therefore to provide for a greater bending moment at the centre of the span and less over the supports than would be necessary with a truly continuous beam. The result is, the resistance over the supports is insufficient to prevent cracks occurring there, especially with heavily loaded floors of large spans. These are unsightly and objectionable, and, of course, if we do not take full advantage of continuity of action, we are led to increase of cost. M. Considère overcomes this difficulty by reinforcing the concrete in compression in continuous beams over supports by means of spirals, as shown in Fig. 1. It will also be noted that the top reinforcements are turned down to form shear members, and also to prevent them sliding in the concrete, which they might do when brought into tension, owing to their short length, if their ends were not anchored in this way.

M. Considère also uses spirals at the centre of the span in independent rectangular beams, to reduce their depth.

For fixed and continuous arches, spiral reinforcing is highly advantageous as resisting the great compressive stresses that may be induced without excessive size.

Fig. 1 shows the general use of spirals in beams and columns.

Fig. 2 shows their use for reinforcing piles. It is remarkable that the Considère piles can be driven without the imposition of a dolly of wood, and a cap of sand or sawdust, which is usually necessary to prevent shattering of the head of piles. Dollies and caps diminish the effect of the blows from a pile driver, and consequently increase the cost of driving, and retard the penetration. Considère piles are driven in an exactly similar manner to timber piles, and without any special appliances.

(*To be continued.*)

At a meeting of the Oldham Corporation Finance Committee, on March 18th, the town clerk read a letter from the Oldham and District Master Builders' Association protesting chiefly against the £500 penalty included in the fair contracts clause which the Finance Committee had under consideration. The letter pointed out that the amount was apparently the highest that any public body had proposed; that it was unreasonable and out of all proportion to the damage that would ensue upon any breach of the conditions; and that the amount of the penalty should be in each case determined by an independent arbitrator. The matter was held over for further consideration.

A NEW TEST FOR CONCRETE.*

By J. S. Owen, B.A., M.D., A.M.Inst.C.E. etc.

(*Concluded.*)

It appeared to the author that it would be interesting if some tests could also be made on hand-mixed concrete; as he has long been of the opinion that a perfectly uniform mixture is very seldom obtained by this method. Arrangements were therefore made to carry out a few tests of such concrete on works where mixing was done by hand. Seven such tests were made, all on works in or near London; in every case the concrete was carefully mixed, probably more carefully than usual in the first four cases, owing to the presence of the foreman or engineer for the works beside the banker; and the fact, which must have been obvious to the men, that some test was to be made. In the fifth test, however, the men were not aware that the concrete would be tested, as on the author's arrival he found a heap of concrete ready mixed for the work; it had been turned twice dry and twice wet, and from this samples were taken.

TABLE B.

Date. 1908.	No. of Test.	Proportions—Ballast, Sand, Cement.	Size of Sample. Cubic Inches.	Sand Layer in Inches.		Cement Layer in Inches.		Ratio: Sand Layer. / Cement „		Per Cent. of Variation of Cement.
				Tube 1.	Tube 2.	Tube 1.	Tube 2.	Tube 1.	Tube 2.	
Oct. 2	1	B } 5 S } C 1	6.25	1.20	1.30	2.40	2.50	0.50	0.52	4
Oct. 2	2	Ditto	6.25	1.30	1.20	2.20	1.90	0.59	0.63	7
Oct. 26	3	B 2 S 1 C ⅔	6.25	1.00	1.10	1.50	1.90	0.67	0.58	15
Oct. 26	4	Ditto	6.25	1.15	1.15	1.50	1.50	0.77	0.77	—
Oct. 28	5	B 4 S 2 C 1	4.21	1.10	1.00	1.30	0.95	0.85	1.05	24
Oct. 28	6	Ditto	4.21	0.97	1.05	0.90	1.12	1.08	0.94	15
Oct. 28	7	Ditto	4.21	0.95	1.20	1.05	1.55	0.90	0.77	17

The results are given in Table B. The glasses used for settlement were 13 inches high by 1½in. diameter.

It will be seen that uniformity of mixture was attained in only one case, although the concrete looked well mixed. This shows, not only the impossibility of determining when mixture is complete by eye alone, but also the difficulty of getting the best results with hand-mixed concrete. The effect of the human element in concrete made without close supervision, is that the variation in the amount of cement in different parts of the concrete was as much as 24 per cent. It is unnecessary to point out what this means, and the waste of material which it implies.

To summarise, the author hopes this test will be of value in enabling engineers to determine whether concrete is being properly mixed or not in any particular case; and in relation to mixing machines, to fix the time necessary for any machine to produce a proper mixture, and thus to determine its legitimate output of well mixed concrete.

The test is very simple, and can be applied, with a little practice, by any engineer. Each test occupies about 15 minutes, and the apparatus costs only a few shillings. Hence it may be regarded as a works test, which can be used wherever concrete is being mixed.

EARTHQUAKE-PROOF BUILDINGS.

The recent earthquakes in Italy have aroused vital interest in the subject in that country of erecting buildings proof against earthquake shock, and as the Messina, Kingston, and San Francisco earthquakes have aroused world-wide interest, we are preparing some instructive essays on the problem of the design of such structures by Italian engineers. We may mention also that an international competition has been arranged by the Lombard Co-operative Society of Public Works under the auspices of the College of Engineers and Architects of Milan, to determine types and methods of building to be adopted in those parts of Italy which are subject to earthquakes. Plans, reports, photographs, and models will be received by March 31st, and awards of £120, £80, and £40 are offered for the best proposals. The secretary's address is 8, Via Lupetta, Milan.

IMPORTED GRANITE AND JOINERY

The use of foreign granite at Rosyth has provoked a wordy warfare in Parliament, the Press, and among the people generally. A pile of cuttings beside us brings very forcibly to mind the fact that the question of Tariff Reform v. Free Trade is once more to the fore over this business; even the Labour representatives in Parliament have urged the view that it would be better to pay a little more for the granite, and ensure the employment of a large number of men at their proper trade, than establish costly relief works for the purpose of dealing with their want of employment. Mr. Dewar, while standing as candidate for the representation of South Edinburgh, was severely heckled over this question, and also over the question of imported joinery. He made the characteristic and logical reply that if joinery was made here—and made dearer—the house would be dearer and the rent more, and that while things were hard on the joiner, the whole community had to be considered. This reply, of course, conforms to the accepted doctrine that the consumer alone is worthy of consideration, and that the mania for cheapness is a thing to be encouraged. It is a view that operates hardly on the whole building trade, on both employers and employees; for the latter get little work, and the former little or no profit. The craze for the lowest tender, encouraged in Government offices, combined with the prevailing depression, is working havoc all round, and the whole thing moves in a vicious circle.

---

*Abstract of a paper read by J. S. Owen, B.A., M.D., A.M.Inst.C.E., etc., before the Society of Engineers, March 1st, 1909.

Federation News.

DEWSBURY ASSOCIATION.

Secretary: E. B. Warmsley.

The February meeting of the Dewsbury Association was held at the residence of Mr. Wm. Garforth, Ravens House, Dewsbury, Mr. Coop in the chair.

The report of the Yorkshire Federation January meeting was discussed.—Messrs. W. Airey and Son, contractors, Leeds, were admitted honorary members of the Association.—It was decided to invite the Yorkshire Federation to hold their monthly meeting in May at Dewsbury.—The members were afterwards entertained to supper by Mr. Garforth, to whom a hearty vote of thanks was accorded for his kind hospitality.

YORK ASSOCIATION.

Secretary: J. Hague, Solicitor.

The York Master Builders' and Contractors' Association held their annual dinner at the Windmill Hotel, York. The Lord Mayor of York (Ald. J. Birch) presided, and was supported by the Sheriff of York (Coun. E. Walker), Mr. W. S. Biscomb (vice-president), Mr. W. R. Thompson (Wednesbury, president of the Yorkshire Federation), Mr. A. W. Sinclair (Scarborough, past-president of the Yorkshire Federation), Mr. J. Davidson (Leeds), Mr. F. W. Spurr (City Surveyor), Mr. S. Needham, and Councillors Sharp (Mansfield), W. H. Birch, F. W. Birch, Hardgrave, Hopkins, Petty, Rickaby, and about 80 members and friends.

After the usual loyal toasts, Mr. Councillor G. Sharp submitted the "Yorkshire Federation." It was, in a sense, he said, the House of Lords of the building associations of the county. Under its guidance, branches had been formed in nearly every town in Yorkshire, and it was one of the largest sections linked with the National Federation. It was the pioneer of the great principle of conciliation, which was afterwards adopted and forwarded by the National Federation. The principle first saw the light in Yorkshire, and the first conference between masters and men took place in their own city of York. The Yorkshire Federation had done excellent work on the question of municipal trading, and their secretary's able pamphlet had proved that much money might have been saved by various corporations if the work undertaken had been carried out by private contractors. He was satisfied that, in the long run, they, as masters and large ratepayers, would come to the conclusion that the money they paid in rates was being used against them, and they would nip in the bud these enterprises as far as possible.

Mr. W. R. Thompson (president), in reply, drew the attention of his hearers to a recent legal decision, by which it had been held that a contractor was responsible for deficiencies in material or workmanship, if it could be proved that he knew they were unsuitable. He advised them, therefore, to draw the attention of the architect (in writing) to any case of unsuitability in materials or workmanship occurring in any future work in which they were engaged. He was glad to congratulate the local association on its strength, and he urged every member to take a deep personal interest in the work. He referred to the case in which a local member had sought the aid of the local association. The matter had been taken up by both the Yorkshire and National Federations, who would give all needful help and support.

Mr. A. W. Sinclair (past president) also replied. He knew of no association where the membership was so large in proportion to its population as that of York. He admired the way in which they bound themselves together, recognising that if they were to have an effective power behind them it would only be theirs in so far as all were united and welded themselves in a common brotherhood.

The Sheriff of York proposed "Success to the York Association," and congratulated them on having the chief magistrate as president, and on the number of members who were also on the City Council. It was such practical business men as they were who were most needed to guide the destinies of the city.

The Lord Mayor, in reply, thanked the members of the association for his election from the bottom of the ladder of membership to his present position. He expressed the pleasure he felt in the presence of the City Surveyor. It expressed the friendly relations which existed between them as contractors and the Corporation officials.

The Vice-President (Mr. W. E. Biscomb) also briefly replied, incidentally mentioning the importance of their trade, which employed more men in the City of York than any other section of trade, with the exception of the North Eastern Railway.

Mr. J. Davidson (Yorkshire Federation Secretary) proposed the "City and Trade of York." He referred to the great honour bestowed upon the association's president, not only by the citizens, but by those of his own calling. He went on to refer to the many ancient buildings to be found in the city, which bore eloquent testimony to the builders of the past, and which reminded present-day builders that they must look to their laurels if they were to emulate the performances of the old-world craftsmen. Referring to the Trades Disputes Bill and the Miners Eight Hours Bill, he said that the latter measure had been declared to be only a beginning, for the avowed aim and ambition of the Labour Party was to make the same conditions apply to every trade and industry in the Kingdom. Parliament legislated, but municipal corporations had often to adminster, with the frequent result, during late years, of further encroachment on members' time, and crushing additions to the rates. The unemployed problem was unfortunately being solved in certain quarters in such a way as to accentuate the difficulty; for in attempting to alleviate the prevalent depression many local authorities were entering into unnecessary and illegitimate competition with private traders. The result was increased cost and reduced efficiency, and also the increase of local indebtedness and reduced value of municipal loans. In the course of a few years large sums of money would have to be found for renewals and replacement of work done by unskilled labour, and in certain instances the cost of such work had been officially admitted to be from 30 to 50 per cent. in excess of what it would have been had the work been done by experienced contractors. In this way the working men were having greater burdens placed upon them, because the additional expenditure involved meant increase in the rates, as well as decrease in the efficiency of the work done. Simply on the basis of the theory "every man to his trade," was it not better in the public interest that this work should be put in the hands of skilled contractors, who were conversant with the wages and conditions under which the men should work, as well as what could reasonably be expected from each? It was notorious that workmen were prepared to carry out a greater measure of work for contractors than for public officials. Commenting upon the Right to Work Bill, the speaker said this, too, would, no doubt, place still greater work upon the shoulders of the corporations, and would take away a large amount of that personal responsibility which should rest on every man. He urged that, whilst municipalities controlled such descriptions of work as were admittedly public monopolies, they should leave trades and industries free to carry out their particular and familiar functions.

Mr. Councillor W. H. Birch replied.

Mr. Councillor Mansfield, J.P., proposed "The Architects and Surveyors," to which the City Surveyor and Mr. S. Needham replied, the latter commenting on the fact that in spite of the great depression in the building trade, no attempt had been made by the masters to reduce the wages of the operatives.

Mr. Councillor F. W. Birch shortly proposed "The Visitors," to which Mr. F. Pottage responded.

CHATHAM AND DISTRICT ASSOCIATION.

Secretary: Herbert Edmonds.

The tenth annual general meeting of the Chatham and District Association was held at the Masonic Hall, Chatham, the president (Mr. Alderman Charles Edward Skinner) in the chair.

The annual report and balance sheet having been received and unanimously adopted, the secretary reported that the membership had decreased—a state of things which should be seriously considered. No improvement in the building trades in the county can be reported, and locally the state of things is very bad, and as a consequence the association has suffered. The depression in trade has prevented the operatives making any demands, but probably it is only the lull before the storm, and when they see their opportunity they will not be slow in taking advantage of it; and it is therefore imperative that the association should be maintained in a state of efficiency.

Officers were re-elected for the ensuing year as follows: President, Mr. Alderman C. E. Skinner; vice-presidents, Mr. R. G. West (Messrs. West Bros.) and Mr. H. E. Phillips; treasurer, Mr. W. Darby (Messrs. J. Darby and Son); auditor, Mr. F. G. Luff; solicitor, Mr. A. Booth Hearn; secretary, Mr. Herbert Edmonds.

One new member was elected. The district comprises Chatham, Rochester, Stroud, Frindsbury, and Gillingham.

WAKEFIELD AND DISTRICT ASSOCIATION.

Secretary: J. Beaumont.

A meeting of the members of the Wakefield and District Association was held at the Strafford Arms Hotel, Wakefield, on March 4th, Mr. Tom Lee (president) in the chair.

A letter of sympathy was sent to Mr. Fallas, who was prevented by illness from attending.

A communication from the Yorkshire Federation asked for the views of the members of the association as to the National form of contract, and the secretary was directed to reply that the members could not suggest any alterations therein.

A similar communication dealing with the engagement of workmen, with a view to the provisions of the Workmen's Compensation Act, was also discussed, and the secretary was instructed to forward to secretary of the Federation certain suggestions.

On the proposition of Mr. Elvey, seconded by Mr. Sanderson, it was decided to hold the future meetings of the association at the Bull Hotel, Wakefield.

A cheque for £5 was signed and directed to be forwarded to the treasurer of the Yorkshire Federation on account of this year's subscriptions, on the motion of Alderman Judge, seconded by Mr. Sanderson.

Mr. Alfred Martin, joiner, Belle Vue, Wakefield, was elected a member of the association, on the proposition of Mr. Pashley, seconded by Mr. Crook.

MANCHESTER, SALFORD, AND DISTRICT ASSOCIATION.

Secretary: John Tomlison.

The number of members of the Manchester, Salford, and District Association is now 193.

The joiners' branch of this association met a deputation from the operatives' society to consider the employers' notices and operatives' counter-proposals for alterations to the working rules. Drafts of the amended rules *re* overtime, discharge notice, and grinding workmen's tools, drawn up in accordance with the Northern Centre Conciliation Board decision, were before the meeting and approved, subject to one or two slight amendments. These alterations have since been signed.

A lengthy discussion took place on the notices at present in hand for alterations to various rules, which have not yet been before the Conciliation Board, namely, the extension of the shorter working hours in winter, defining the district within which the rules are to apply, and the deletion of the walking time rule, the employers suggesting that travelling expenses be allowed in lieu of walking time.

The operatives agreed to lay the employers' views before their members, and to notify the employers of the result.

It was reported that the plasterers' and painters' branch of the association had been very active in the consideration of several important matters of trade interest. Meetings have been held with the manufacturers of patent plaster partitions, with a view to coming to some agreement as to the fixing and finishing of their plates, and a further meeting was arranged for March 16th.

The branch have also had under consideration the methods adopted by a certain firm of manufacturers in the sale of their materials, and a conference has been arranged with representatives of the firm with a view to arriving at some definite understanding thereon.

A case has been before the branch where an official of the operatives' society has lodged certain charges with an architect against one of the members with respect to a certain contract then in hand, and the matter was referred to the general committee, with a request that they deal with it as early as possible.

The monthly meeting of the general committee of the association was held at the Board-room, Blackfriars Street, in the following week, when the senior vice-president (Mr. S. Gerrard), in the absence of the president, presided over a well-attended meeting.

Eight new members were elected into the association.

Copies of the clauses contained in the Manchester Corporation Bill now before Parliament, in which they were seeking to obtain powers to control the new methods of building construction, such as iron, steel, and reinforced concrete, were considered, and after giving the same full consideration, it was decided not to oppose the clauses.

A special meeting of the committee was held a fortnight later, to consider the case of a member of the plasterers' and painters' branch, where the operatives had lodged certain charges against him with the architect regarding a contract he was then executing (referred to above). After hearing explanations from the secretary and the member concerned, and giving the same full consideration, a deputation was appointed to lay the case before counsel.

A vote of condolence and sympathy was passed with the wife and family of the late Mr. J. B. Peace, of the firm of Messrs. Peace and Norquoy, Ltd.

WORCESTER AND DISTRICT ASSOCIATION.

Secretary: W. Phelps.

The annual meeting of the Worcester and District Association was held at the Star Hotel, and was fairly well attended by the local members, though we should have welcomed the Malvern members.

The report mentioned the satisfactory working of the Conciliation Board, and included a strong recommendation to all to become subscribers to the "Builders' Journal," as well for its usefulness as a trade medium as for its standing as the official organ of the National Federation. The combined insurance scheme with the Law Car Co., with its low premiums and its promptness in meeting claims, was commended.

The balance-sheet showed a gain of £9 10s. on the year's working.

It was decided to hold meetings bi-monthly, and special meetings when necessary.

Mr. J. Stokes was re-elected president and Mr. J. J. Wood vice-president and representative to the Midland Executive Council; Mr. H. J. Probert, treasurer; and Mr. A. H. Constance and Mr. C. F. Brown auditors.

HULL ASSOCIATION.

Hon. Secretary: A. Peers.

The monthly meeting of the Hull Association was held at the Builders' Exchange, on Wednesday evening, March 10th. The president, Mr. E. Quibell, occupied the chair, and was supported by a good attendance of the members. Reference was made to the recent decease of Mr. Thomas Goates, of 39, Brunswick Avenue, Hull. Mr. Goates was one of the oldest builders in Hull, and had won general respect. The members unanimously resolved that a letter of condolence be sent to the family.

A report of the recent whist drive in connection with the association showed the satisfactory result of a profit of £2 6s.

Mr. W. Clarke, plumber, was formally initiated as a member into the association.

Suggested amendments for the National contract agreement (as requested by the Yorkshire Federation) were submitted by a sub-committee, and approved of. Mr. J. Davidson (secretary of the Yorkshire Federation) addressed the meeting on the necessity of strong trade organisations, and also on the Federation insurance scheme. The many advantages and benefits of workmen's insurance under Lloyds were dealt with, and it was shown that further advantages would accrue as a greater number of members took it up. In the discussion, a considerable number of questions were asked, and were ably replied to by Mr. Davidson. It is hoped that, as a result of the meeting, other members will decide to support the scheme when their present policies expire. A hearty vote of thanks was accorded Mr. Davidson for attending the meeting and speaking upon these interesting and important matters. Owing to the lateness of the hour, the remaining matters on the agenda were deferred until the next meeting.

Coming Events.

Thursday, April 1.

Leicester and Leicestershire Society of Architects.—Mr. W. K. Bedingfield on "The Architectural Possibilities of Reinforced Concrete."

Friday, April 2.

Institution of Civil Engineers (Great George Street, Westminster). — Students' Meeting: Mr. W. E. R. Gurney on "Reinforced Concrete on Railways," 8 p.m.

Monday, April 5.

Society of Engineers (17, Victoria Street, Westminster).—Ordinary Meeting, 7.30 p.m.

Liverpool Architectural Society (13, Harrington Street).—Annual General Meeting.

Wednesday, April 7.

Northern Polytechnic Architectural and Building Students' Association.—Lecture on "The Hennebique System of Reinforced Concrete," 8 p.m.

Edinburgh Architectural Association (117, George Street).—Associates' Business Meeting, 8 p.m.

Thursday, April 8.

Sheffield Society of Architects and Surveyors (University, Western Bank).—Annual Meeting.

Paint and Varnish Society (St. Bride's Institute, E.C.).—Mr. W. G. Aston on "Lakes," 8 p.m.

Saturday, April 10.

Edinburgh Architectural Association (117, George Street).—Visit to St. Catherine's and St. Margaret's Convents: Leader, Mr. Archibald Macpherson, F.R.I.B.A.

Wednesday, April 14.

Edinburgh Architectural Association (117, George Street).—Annual Business Meeting and President's Address, 8 p.m.

Insurance.

Free £500 Accident Insurance Coupons have been sent to the following:

T. H. P. (Plymouth), P. F. N. (Streatham Hill), R. G. S. (Balham), H. C. C. (Maida Vale), R. G. (Brighton), H. G. C. (Deptford), H. W. S. (Kingston), S. R. (Eltham), G. W. (Southport), F. W. (Newcastle), A. S. H. (Gt. Yarmouth), A. F. J. (Glasgow), J. M. L. (Harrow), J. B. (Smethwick), J. E. B. (Spilsby), H. J. W. (Epsom), C. H. K. (London, S.W.), T. F. (Barnard Castle), E. J. P. (Leicester), W. C. (Leicester), H. J. L. (Braintree), F. C. P. (East Dulwich), S. E. (Barnstaple), W. S. D. (Kensington), A. G. B. (Rotherham), H. W. A. (Hampstead), N. N. J. (Sidmouth), F. C. W. D. (Maida Vale), C. O. C. (Manchester), J. H. (Peckham), F. G. R. (London, S.E.), J. S. G. (Manchester), G. N. (Catford), J. O. P. (Swansea), H. B. (Wealdstone), C. R. (Sheffield), A. P. (Leigh), B. E. A. (Hampstead), W. C. (Bolton), J. C. (Leicester), L. H. C. (Leicester), H. G. T. (Thornton Heath), L. S. F. (Penarth), D. S. R. (Grimsby).

Church " Lined Throughout with CALMON Asbestos Slate

CALMON

ASBESTOS SLATE

Fire-Resisting Material for Partitions, Ceilings, Etc.

INEXPENSIVE and EASILY FIXED
CHEAPER THAN LATH and PLASTER

AN IDEAL LINING FOR
LIGHT BUILDINGS, BUNGALOWS, PAVILIONS, ETC.

Calmon Asbestos & Rubber Works, Ltd.,
1, 2 & 3, TRINITY PLACE, TOWER HILL, LONDON.

AGENTS:
WM. H. TURCAN, 52, St. Enoch Square, Glasgow (Sole Agent for Scotland).
R. W. DE HELSBY, Heaton Moor, Stockport (Sole Agent for Manchester District).
W. J. JOBSON, 32, Clayton Street West, Newcastle-on-Tyne (Sole Agent for Newcastle District).
IRELAND: LYTLE & POLLOCK, 20, Dunbar Street, Belfast.
SOUTH WALES: W. H. HERBERT & CO., 15 Temple Street, Swansea.

ARE YOU VISITING THE GREAT

Offices: 43, Essex Street, Strand, W.C.

H. GREVILLE MONTGOMERY, M.P. } Promoters.
H. C. MONTGOMERY. }

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Ackergill, near Wick, Scotland.—For the construction of a reinforced concrete slipway and the execution of other works at Ackergill, near Wick, in the county of Caithness, N.B., upon the foreshore and land adjoining in Ackergill Haven, for the Committee of Management of the Royal National Lifeboat Institution. Mr. W. T. Douglass, M.I.C.E., engineer and architect, 15, Victoria Street, Westminster, London, S.W. :—

R. Thorburn and Son, Edinburgh	£2,700	0	0
Davidson and Miller, Newcastle	2,552	5	0
L. P. Nott, London	2,207	1	7
G. McAdie, Wick	1,835	13	0
Exors of J. Arundel, Bradford	1,645	0	0
J. Tait, Wick	1,571	14	9
Lewis Construction Co., Stratford, E.	1,382	9	2
F. Handman and Co., London	1,323	0	0
E. R. Lester,* Plymouth ...	1,147	0	0

*Accepted.

Basingstoke.—For alterations and additions to premises, Church Street, for the Conservative and Unionist Association. Mr. W. Roland Howell, F.R.I.B.A., architect, Reading, and 18, Percy Street, W. :—

	For General Building Works.	For Painting & Decorating.	For both.
Mussellwhite and Sapp—	£1,297 0 0	£125 0 0	£1,422 0 0
W. H. Tigwell—	1,311 0 0	102 0 0	1,413 0 0
R. Tarrant—	1,281 0 0	120 0 0	1,366 10 0
Sutton and Co.—	1,245 14 0	113 12 0	1,356 0 0
A. Jennings—	1,195 10 0	153 0 0	1,348 10 0
J. Harris—	1,129 0 0	119 0 0	1,248 0 0
Goodall and Co.*—	1,118 15 0	121 10 0	1,240 0 0
C. Munford—		128 0 0	
Doman and Sons*—		92 10 0	

All of Basingstoke.

*Accepted.

Bangor, Wales.—For erecting a cottage on Gorad Road, Upper Bangor. Mr. W. G. Williams, architect, 202, High Street, Bangor :—

Roberts and Williams	£1,014
J. M. Jones	929
Jones and Williams	867
W. Parry	817
Roberts and Owen	806
Watkin, Jones, and Son,* Bangor ...	765
J. Owen	655

*Accepted.

Bangor.—For the erection of a technical school and free library, Hamilton Road, for the Urban District Council. Mr. E. L. Woods, C.E., architect, 97, Main Street, Bangor. Quantities by Mr. S. C. Hunter, Scottish Provident Buildings, Belfast :—

Hutchinson and Keith	£3,187	0	0
J. and W. Stewart	3,169	0	0
W. J. Campbell and Son ...	2,995	0	0
Courtney and Co.	2,920	0	0
J. and R. Thompson, Ltd. ...	2,898	0	0
J. Kidd	2,890	0	0
Thornbury Bros.	2,839	0	0
T. Paisley and Sons	2,835	0	0
McRoberts and Armstrong ...	2,786	19	4
I. Copeland	2,707	0	0
McIntyre Bros	2,706	0	0
W. Dowling,* Belfast	2,625	12	3

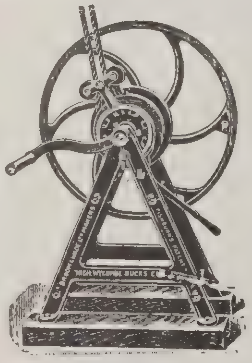
*Accepted.

Bitton, near Bristol.—For erection of a new elementary school at Bitton, near Bristol, for the Gloucestershire Education Committee. Mr. R. S. Phillips, architect, Midland Bank Chambers, The Cross, Gloucester :—

W. T. Stevenson, Plymouth ...	£3,300	0	0
Erwood and Morris, Bath ...	2,768	15	0
J. Long and Sons, Ltd., Bath...	2,765	0	0
F. J. Amery, Bath	2,750	0	0
H. W. Pollard and Son, Bridgwater	2,725	0	0
F. J. Blackmore, Bath	2,660	0	0
A. Wills and Sons, Bath ...	2,598	0	0
E. Clark and Sons	2,593	0	0
Stephens, Bastow and Co. ...	2,589	0	0
W. T. Nicholls, Gloucester ...	2,528	0	0
C. A. Hayes and Sons	2,521	0	0
E. Love	2,500	0	0
E. Pruce	2,500	0	0
E. Walters and Son	2,487	0	0
E. Chancellor and Sons, Bath...	2,475	0	0
Adams and Jefferies	2,300	0	0
R. Wilkins and Sons	2,319	0	0
A. J. Colborne, Swindon ...	2,249	15	0
Geo. Dimery and Sons,* Berkeley	2,242	10	0

*Provisionally accepted.
Rest of Bristol.

(*Tenders continued on page viii.*)



Reduce your Wages by using
BROOM & WADE'S
PATENT HOIST.

This is the most Efficient Hoist on the market for hoisting barrows of bricks, concrete, &c., without Gearing.

BROOM & WADE, LTD.,
Engineers, HIGH WYCOMBE.

LIFTS, CRANES, CRABS
REVOLVING SHUTTERS,
COLLAPSIBLE GATES,
SLIDING PARTITIONS.
DENNISON, KETT & Co., Ltd.,
11, Queen Victoria Street, LONDON, E.C.
Iron Staircases, Doors and Sashes.
CATALOGUE FREE ON APPLICATION.
Telegrams: "Hoisters, London." Telephone, Bank 8356. A B C Code.

MINTON·TILES
MINTON·HOLLINS & Co
BY·APPOINTMENT·TO·HIS·MAJESTY·
DIEU ET MON DROIT
·TILES·
FAIENCE
·MOSAIC·
12 FIRST·CLASS & GOLD MEDALS·AWARDED
HEAD OFFICE & SHOWROOMS·PATENT·TILE·WORKS STOKE UPON TRENT·LONDON HOUSE & SHOWROOMS·109 GREAT PORTLAND ST W·

REINFORCED CONCRETE. STEELWIRE LATTICE SYSTEM

BRIDGE
FOR
H.M.
OFFICE
OF
WORKS.

London
Exhibition.

STAND
NO. 258, Row R.

RD. JOHNSON, CLAPHAM & MORRIS, Ltd., Reinforcement Dept. 24, Lever St., Manchester.

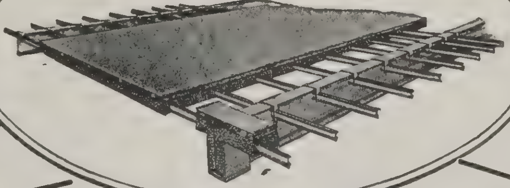
Telegrams: METALLICUS
Telephone 6473 } Manchester.

COLUMBIAN FIREPROOFING Co., Ltd.

Reinforced Concrete
Floors.

RITZ HOTEL, PICCADILLY.
WARING'S, OXFORD ST., W.
ROYAL INFIRMARY, GLASGOW.
"MORNING POST," STRAND.
LAMBETH DISTILLERY.
50 Repeat Orders for L. C. M. BANKS.

ECONOMICAL CONSTRUCTION.
RIGID AND SOUNDPROOF.
SAVING IN COST.
OWNERS & ARCHITECTS ENTIRELY SATISFIED.
SEND FOR PARTICULARS.



"COLUMBIAN"
System.

37, KING WILLIAM STREET, LONDON, E.C.

A.W.E.
TEL. No. 5080 BANK.

(Tenders continued from page vi.)

Bristol.—For the erection of a chancel, with vestries, etc., at the Church of St. Anne's, Brislington, for the Church Building Committee. Mr. H. M. Bennett, architect, 36, Corn Street, Bristol:—

F. J. Blackmore	£1,635	0	0
Stephens and Baslow, Ltd.	1,627	0	0
S. Martin and Son	1,550	0	0
D. J. Tanner and Son	1,537	0	0
J. Long and Sons, Ltd.	1,528	0	0
F. Chown	1,510	0	0
Adams and Jefferies	1,495	0	0
E. Preece	1,467	0	0
E. Chancellor and Sons	1,464	19	0
C. A. Hayes and Sons	1,443	0	0
Forse and Sons	1,429	0	0
C. Chorley and Son	1,415	6	10
R. Wilkins and Sons,* Bristol	1,364	0	0

*Accepted.

London.—For erection of divisional offices, Tredegar Road, Bow, for the London County Council:—

Holloway Bros. (London), Ltd., Belvedere Road	£5,080
F. and H. F. Higgs, Herne Hill	4,826
E. Lawrance and Sons, Wharf Road, City Road	4,696
Leslie and Co., Ltd., Kensington Square	4,648
W. Johnson and Co., Ltd., Wandsworth Common	4,634
F. and T. Thorne, Isle of Dogs	4,588
H. L. Holloway, Deptford	4,533
C. Wall, Ltd.,* 4, Lloyd's Avenue	4,371

Architect's estimate, £4,750.
*Recommended for acceptance.

Ledsham, Cheshire.—Accepted for erection of the first block of buildings for small holdings on the Ledsham Estate, for the Cheshire County Council:—

W. Gradwell, Barrow-in-Furness; about £7,000.

Maidstone.—For the erection of an elementary school in Union Street, for the Education Authority. Mr. T. F. Bunting, Borough Surveyor, Fair Meadow, Maidstone:—

G. Pearce and Sons	£15,430	0	0
R. Corben and Co.	14,813	0	0
Cox Bros.	14,499	0	0
Barden and Head	14,386	6	6
Elmore and Son	13,750	0	0
Clarke and Epps	13,400	0	0
G. E. Wallis and Sons, Ltd.	13,343	0	0
W. T. Burrows*	13,339	0	0

(All of Maidstone.)
*Accepted.

Pembury, Kent.—For alterations to and new buildings at the Infirmary and Men's Day Room, at the Workhouse, Pembury, for the Guardians of Tonbridge Union. Mr. S. Philpott, architect, 65, High Street, Tunbridge Wells:—

F. G. Elliott, Cranbrook	£627	0	0
Sykes and Sons, Tunbridge Wells	498	15	0
Roberts and Co., Tunbridge Wells	490	0	0
Soper and Jones, Tunbridge Wells	461	0	0
G. E. F. Penn, Pembury	453	0	0
Stanbridge and Son, Tunbridge Wells	452	12	0
Goodwin Bros., Tunbridge Wells	447	0	0
J. Crates, Tunbridge Wells	444	0	0
E. Smith, Tunbridge Wells	435	0	0
F. Burr, Tunbridge Wells	428	0	0
Punnett and Sons,* Tonbridge, Kent	413	0	0
K. C. Jarvis, Tonbridge, Kent	410	0	0

*Accepted.

Paignton.—For the erection of a pair of dwelling-houses, for Messrs. A. Belfield and others. Messrs. Norman G. Bridgman, A.R.I.B.A., and Walter H. Bridgman, M.S.A., architects and surveyors, Torquay and Paignton:—

E. Foxworthy	£1,115	0	0
S. Godfrey	1,070	0	0
W. Smaridge	1,059	10	0
H. Drew	1,037	0	0
G. Webber	1,029	0	0
Flood and Popplestone*	825	0	0

*Accepted.

Trefdraeth, Anglesey.—For erecting a Council school, for the Anglesey Education Committee. Mr. J. Owen, F.R.I.B.A., county architect, Menai Bridge:—

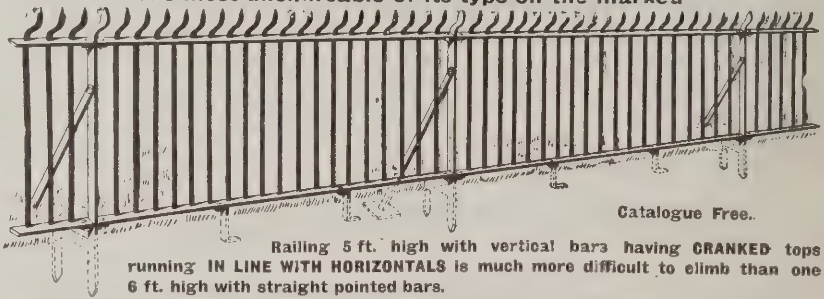
J. Roberts and Son	£2,222
J. D. Pritchard	1,996
W. and R. Jones	1,935
R. Jones	1,759
Roberts and Williams	1,754
H. Hughes	1,724
H. and J. Williams	1,561
T. G. Prytherch	1,485
O. W. and T. Rowlands,* Rhosneige	1,375

*Accepted.

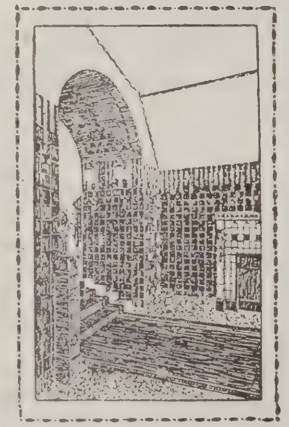
W.C. CISTERNS.
Best Cistern on Earth. Used in the Best Work
Inexpensive. Sensitive. Frost Proof.
Always Fills. Silent. Quick Filling
HOLT'S PATENTS, 3, Smithfield St., Liverpool.

LIGHTNING CONDUCTORS
Supplied, Erected and Tested. Chimney Shafts Restored, &c.
J. LEWIS, 5 & 6, Great Winchester Street LONDON, E.C.
TELEPHONE No. 3053 CENTRAL.

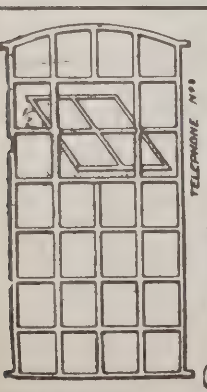
BAYLISS, JONES & BAYLISS LTD.,
THE "CRANKED BAR" RAILING.
The most unclimbable of its type on the market.



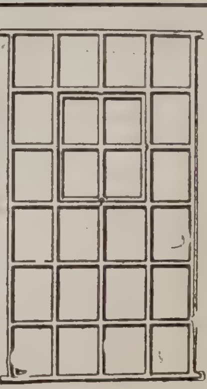
Catalogue Free.
Railing 5 ft. high with vertical bars having CRANKED tops running IN LINE WITH HORIZONTALS is much more difficult to climb than one 6 ft. high with straight pointed bars.
WOLVERHAMPTON & CANNON STREET, LONDON, E.C.



"Modernia" Patent Glass Tiles
give an artistic and novel effect.
No glassy surface. Coloured throughout. Substance about ¼ inch. Any colour supplied. Prospectus, Samples, Estimates and Designs for complete decorations, free.
The "Modernia" Patent Glass Tile Co.
Sole Concessionaires: Aug. Brennecke & Co., 68 Finsbury Pavement, London, E.C.
STAND 18B., BUILDING TRADES' EXHIBITION, OLYMPIA.



PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART
TELEPHONE No 9 · 9492 Central
MEASURES BROS LTD 53B SOUTHWARK ST. LONDON, S.E. & PITLAKE, CROYDON.
TELEPHONE No 171 CROYDON.
10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.
SECTION SHEETS, BOOKS & PRICES ON APPLICATION.
CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.



STEEL SHAFTING, from 2½ in. to 8 in. diameter an up to 36 feet long, always kept in stock.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

April 1. DUNDEE.—Alterations at No. 61, Reform Street, and fittings for town clerk's office. Particulars at the office of Jas. Thomson, city architect, 91, Commercial Street, Dundee. Tenders with Wm. H. Blyth Martin, town clerk, city chambers, Dundee, by April 1.

April 1. WINDERMERE.—Erection of new premises in Crescent Road, Windermere, for the Bank of Liverpool, Ltd. Plans and specifications, and bills of quantities, at the offices of Walker, Carter, and Walker, architects, Windermere. Tenders, endorsed "New Bank Premises," to be delivered to the architects by first post on April 1.

April 2. FORRES.—Mason, carpenter, slater, plaster, plumber, painter and glazier works for cookery room to be erected at Radford public school. Plans and specifications with Charles C. Doig and Son, architects, 75, High Street, Forres. Tenders with C. C. Mackenzie, clerk to the board, by April 2.

April 2. FORRES.—Mason, carpenter, slater, plaster, plumber, painter, and glazier, and iron work of drill hall, to be erected at Forres for the 6th Seaforth Highlanders. Plans and specifications with, and schedules of quantities obtained from, Charles C. Doig and Son, architects, 75, High Street, Forres, to whom tenders are to be sent by April 2.

April 3. ABERAVON.—Rebuilding the "Railway Tavern," Water Street, Aberavon, for E. Evans Bevan, Neath. Plans and specification, and bills of quantities, at the offices of J. Cook Rees, architect, The Parade, Neath. Tenders to be sent in by 10 a.m. on April 3, endorsed "Tenders for Railway Tavern, Aberavon."

April 3. LOCKERLEY, near ROMSEY. —Erection of two small brick bridges at Lickerley, near Romsey, for the Southampton C.C. Plan and specification, conditions of contract, and all other information, at the office of W. J. Taylor, county surveyor, The Castle, Winchester. Deposit of £1 1s. (cheque) payable to the Hants County Council, and crossed Bank of England. Tenders, endorsed "Lockerley Bridges," by 10 a.m. on April 3, to H. Barber, clerk to the C.C., The Castle, Winchester.

April 5. HULL.—Additions to the "Phœnix" printing works, Manor Street, Hull, for M. Harland and Son. Drawings and particulars on £1 deposit. Tenders by noon on April 5, to Arthur Easton, architect, 7, Land-of-Green-Ginger, Hull.

April 5. HARRINGTON (CUMBERLAND).—Slating, plumbing, plastering, glazing, and painting a house at Harrington, for J. Blacklock. Plans and bills of quantities upon application to W. G. Scott and Co., architects and surveyors, Workington, to whom tenders must be sent by April 5.

April 5. BINGLEY.—Erection of a training college, at Bingley, for the West Riding Education Committee. Plans may be seen and specifications with quantities obtained on application to the West Riding architect, County Hall, Wakefield. £1 deposit in each case by separate letter to the West Riding Treasurer, County Hall, Wakefield. Tenders by 10.30 a.m. on April 5, to Francis Alvey Darwin, clerk to the C.C., County Hall, Wakefield.

April 5. TONYREFAIL.—Erection of a new police-station at Tonyrefail, for the Glamorgan C.C. Plans and specification, and copies of the bill of quantities, at the police-station, Tonyrefail, and at the offices. Tenders, with the names and addresses of two sureties, by April 5, to T. Mansel Franklen, Glamorgan County Offices, Westgate Street, Cardiff. Fair wages clause.

April 5. CRUMLIN (MON.).—Erection of a miners' rescue brigade station, at Crumlin, Mon., for the Monmouthshire Coal Owners' Association. Plans and specifications at the offices of the architect, where bills of quantities may also be obtained upon deposit of £1 1s. Tenders by noon on April 5, to A. F. Webb, architect, High Street, Blackwood, Mon.

April 5-16. LINDSEY.—Erection of, or additions to elementary schools, as under:—Ropery Road, Gainsborough (new block); South Killingholme (new school with teacher's house); Skegness Council (additions); Crosby (additions); for the C.C. Education Committee. Bills of quantities and forms of tender on application to Scorer and Gamble, architects, Bank Street Chambers, Lincoln, by April 5, and £2 2s. deposit. Drawing and conditions of contract at the offices of the architects. Tenders before 10 a.m. on April 16, to S. Maudson Grant, secretary, 285, High Street, Lincoln.

April 6. STEVENAGE.—Erection of a dwelling-house, bakehouse, stables, meal-house, etc., at Stevenage, Herts, for F. Gray. Plans and specification may be seen with J. Shilcock, Hitchin, to whom tenders are to be sent by 10 a.m. on April 6.

April 6. TENBY.—Erection of a new bath room, etc., at Bay View, The Norton, Tenby, for Mrs. McCulloch. Plans and specifications at the office of the architect. Tenders, endorsed "Bay View," by April 6, to J. Preece James, architect, Tenby.

April 6. EBBW VALE (MON.).—Erection of 50 or more cottages at Ebbw Vale, for the Mount Pleasant "Model Cottage" Building Club. Plans and specifications, and full particulars at the office of Wm. Harris, architect and surveyor, Bank Chambers, Bargoel. Tenders by noon on April 6 to the acting secretary, A. Iorwerth Clark, Bank Chambers, Bargoed.

April 6. ABERDARE.—Erection of new farm buildings at Tyr-Rhos, Llwydcoed, Aberdare, for the trustees of Hamlen-Williams Estate. Drawings and specifications, and bill of quantities at the office of the architect, on deposit of £1 1s. Tenders, endorsed "New Farm Buildings, Tyr-Rhos," addressed to the trustees, by 5 p.m. on April 6, to J. Llewellin Smith, M.S.A., architect, Aberdare.

April 7. OVERTOWN, PLUSCARDEN.—Mason, carpenter, plumber, and slater works of additions and alterations at the farm steading of Overtown, Pluscarden. Plans and specifications, with John Wittet, architect, Elgin, to whom tenders are to be sent by April 7.

April 8. FFOSRHYDYGALED, near ABERYSTWYTH.—Alterations and additions to Ffosrhydygaled, near Aberystwyth, for Morris Davies. Plans and specifications on application to G. T. Bassett, A.R.I.B.A., architect and surveyor, Aberystwyth, to whom tenders are to be sent by April 8.

April 10. NARBERTH.—Construction of a new cattle market, sheds, boundary walls, and other appurtenant works at Narberth. Plans, specifications, and conditions of contract, at the office of J. Preece James, architect, Tenby, or at the offices of Lewis and James, solicitors, Narberth, to whom tenders are to be sent, endorsed "Cattle Market," by April 10.

April 12. NARBERTH.—Pulling down old building and erection of a new masonic lodge on the site at Narberth. Plans and specifications at the office of J. Preece James, architect, Tenby, or at the offices of Lascelles and Lewis, solicitors, Narberth, to whom tenders, endorsed "Masonic Lodge," are to be delivered by April 12.

April 13. BEVERLEY.—(a) Erection of a council school to accommodate 89 children, at Wawne; (b) erection of a cloak room, etc., at the council school at Burstwick; (c) alterations and additions to the council school at Ryhill-cum-Camerton, for the East Riding of Yorkshire C.C. Plans and specifications, and forms of tender, on application to the building surveyor, county hall, Beverley. Quantities in respect of the Wawne school only upon deposit of £1 1s. Tenders by 10 a.m. on April 13, to John Bickersteth, clerk to the East Riding Education Authority, County Hall, Beverley.

April 14. YNYSYBWL.—Erection of a church and hall at Ynysybwl, for the vicar of Llanwonno. Names, accompanied by £1 1s. deposit, by April 14, to T. E. Richards, A.R.I.B.A., architect, Pontypridd, with whom plans and specifications may be seen.

April 14. BRAMPTON.—Small alterations at the police station, for the Cumberland C.C. Names to the architect. All particulars either at the police station, Brampton, or with Geo. Dale Oliver, county architect, Carlisle, to whom tenders are to be sent by 10 a.m. on April 14.

April 14. WHITLAND.—Erection of a butter stores, dwelling house, out-offices and boundary walls at Whitland, for David Jeremy and Sons, Dowlais. Plans and specifications at the architect's office, or at the Abbey Temperance Hotel, Whitland. Tenders, endorsed "Butter Stores, Whitland," by April 14, to J. Preece James, architect, Tenby.

April 17. ST. ERME.—Reconstruction of a stable and harness-room, etc., at St. Erme Rectory. Plans and specifications for the whole of the work, or for the mason's and carpenter's work separately, will be received up to April 17, by H. Tresawna, St. Austell, or the Rev. J. O. Gunning, St. Erme Rectory.

April 19. STEVENAGE.—Erection and completion of a new county council school at Stevenage, for the Hertfordshire C.C. Drawings, specification, agreement, etc., at the county surveyor's office, Hatfield, on and after April 5. A copy of the schedule of works (quantities) and form of tender at the county surveyor's office upon deposit of £2 2s. Tenders, endorsed "Tender for New County Council School, Stevenage," by 5 p.m. on April 19, to Urban A. Smith, county surveyor, county surveyor's office, Hatfield.

April 24. RADCLIFFE, MANCHESTER. —Erection and completion of new council offices for the U.D.C. All information at the offices of the architects, W. M. Gillow, 66, Deansgate, Manchester, and R. Holt, 8, Victoria Street, Liverpool, on deposit of £2 2s. Tenders by noon on April 24 to S. Mills, clerk to the council, council offices, Radcliffe, Manchester.

April 26. SURBITON.—Erection and completion of extensions to the electricity works in Ewell Road, for the U.D.C. Forms of tender and bills of quantities of the clerk on deposit of £5 (Bank of England note). Drawings, specifications, and form of contract of the architect to the council, John Armitage, Sanctuary House, Westminster. Tenders by 10 a.m. on April 26, to F. J. Bell, deputy clerk, council offices, Ewell Road, Surbiton.

April 27. CANTERBURY.—Erection of new recreation rooms, and other works, in connection therewith, at the asylum, for the Kent County Asylums Committee. Drawing and specifications at the office of W. J. Jennings, architect, 4, St. Margaret's Street, Canterbury, where also can be obtained bills of quantities on deposit of £5. Tenders by 10 a.m. on April 29, to Francis R. Howlett, clerk to the Kent County Asylums Committee, 9a, King Street, Maidstone.

ENGINEERING.

April 3. WOTTON-UNDER-EDGE.—1, Cutting trenches and hauling, laying, and jointing about 1,731 lin. yards of 7in., 6in., and 4in. cast iron pipes, and supply and fixing of valves and other fittings; also construction of a brick conduit, with other works incidental to the contract. 2, erection and completion of a pumping station, consisting of engine-house, pump-house, and gas producer house, together with engine bed foundations, and other works incidental to the contract. 3, provision and erection of a [illegible] B.H.P. suction gas engine and plant, also a three-throw pump, with other works incidental to the contract; for the R.D.C. Plans and specifications, bill of quantities, and forms of tender, on application to the engineer, Henry J. Weaver, C.E., F.G.S., Northgate Mansions, Gloucester, and on deposit. Tenders, endorsed "Wotton Waterworks," by noon on April 3, to J. G. Wenden, clerk to the council, Dursley.

April 6. TRURO.—Construction of a retaining wall on the south side of Station Road, opposite to Truro railway station, for the City Council. Drawings, forms of tender, bills of quantities, and particulars, upon application to the engineer and surveyor, and deposit of £1. Tenders, endorsed "Tender for retaining wall," by noon on April 6, to Fredk. A. Barnes, Assoc.M.Inst.C.E., city engineer and surveyor, municipal buildings, Truro.

April 17. SANDBACK, CHESHIRE.—Supply and erection of a gas engine and suction producer gas plant, also supply and erection of a vertical three-throw ram pump and shafting, for the U.D.C. Plans and copies of specifications at the surveyor's office, Welles Street, Sandbach. Tenders, endorsed "Gas Engine, etc.," "Pump, etc.," by noon on April 17, to A. E. Stringer, clerk to the council, Sandbach, Cheshire.

April 12. PENRITH.—Supplying, laying, and jointing about 14 miles of 3in. diam. cast iron piping, and about 6 miles of 4in. diam. cast iron piping, with valves, hydrants, etc., for the R.D.C. Plans and specification prepared by Joseph Graham, civil engineer, 28, Castle Street, Carlisle. Specifications and bills of quantities, with form of tender, at the office of the engineer upon deposit of £1 (cheque). Tenders, endorsed "Hesket Water Supply (Extension)," to be delivered by April 12, to J. W. Smith, clerk, public offices, Penrith.

April 21. ELY.—Erection of a brick and Steel bridge of 100ft. span over the River Ouse at Ely, for the Isle of Ely C.C., as follows:—1, Foundations and brickwork; 2, steel superstructure. Applications to R. S. W. Perkins, county surveyor, Ely, by March 31, stating which quantities are required, accompanied by a cheque £3 3s. (payable to the Isle of Ely treasurer) as deposit. Tenders by April 21, to C. E. F. Copeman, clerk to the C.C., C.C. offices, Wisbech.

IRON AND STEEL.

April 17. BRAINTREE.—Delivery and erection of a new square stamped steel tank, in the tank yard, Braintree, Essex, for the U.D.C. Drawings, specification, and form of tender, from the engineer, Percy Griffith, M.Inst.C.E., F.G.S., 54, Parliament Street, Westminster, S.W., on deposit of £2. Tenders, endorsed "Contract No. 4," by April 17, to Herbert J. Cunnington, clerk to the council, Braintree, Essex.

PAINTING.

April 13. RAMSGATE.—Renovating and painting the whole of the interior of the scarlet fever wards at the isolation hospital, Haine, near Ramsgate. Specifications, with forms of tender, at the office of H. Bertram Langham, architect, Bank Chambers, Broadstairs. Tenders, accompanied by deposit £10 per cent. on the amount of tender, marked "Works Tender," by April 13, to Sidney Shea, clerk to the board, 19, Cecil Square, Margate.

April 6. NEASDEN.—Cleansing and painting works at the isolation hospital, Dog Lane, Neasden, for the Willesden District Council. Specification, with form of tender, and all further particulars, upon application to O. Claude Robson, M.Inst.C.E., engineer to the council, public offices, Dyne Road, Kilburn, N.W. Tenders, endorsed "Painting Hospital," to be delivered by 4 p.m. on April 6, to Stanley W. Ball, clerk to the council, public offices, Dyne Road, Kilburn, N.W. £10 deposit.

April 8. BARNSTAPLE.—Whitewashing and colouring the exterior of the union workhouse, also whitewashing and colouring the exterior and interior of the guardians' cottage homes, for the union; to include all necessary repairs to plastering, where required. Particulars on application to the master of the union workhouse. Tenders, endorsed "Tenders for Whitewashing," by 10 a.m. on April 8, to W. H. Toller, clerk, Barnstaple.

PLUMBING & SANITARY

April 8. HITCHIN.—Construction of about 300 linear yards of 9in. earthenware pipe sewer, and 80 yards of 6in. earthenware pipe sewer at Pirton, for the R.D.C. Plans and specifications may be seen at the office of the clerk. Tenders, marked "Pirton Drainage," by April 8, to A. E. Passingham, clerk to the council, old town hall, Hitchin.

April 13. ST. MELLON'S, MONMOUTHSHIRE.—Sewering the Rogerstone drainage area, for the R.D.C. Drawings and specifications at the offices of the clerk, from whom bills of quantities, schedule of prices, and forms of tender may be obtained upon deposit of £5. Tenders, endorsed "Rogerstone Sewerage," before four p.m. on April 13, to Ithel Thomas, clerk, union offices, Queen's Hill, Newport, Mon.

ROADS AND CARTAGE.

April 3. BADENOCH, INVERNESS-SHIRE.—Up-keep of roads and bridges in Laggan, extent 35½ miles, or thereby, for a period of three years from Whitsunday next, for the Inverness-shire C.C. Specification and schedule of quantities of John Mackenzie, road surveyor, County Buildings, Kingussie, on deposit of 10s. Offers with John Grant, district clerk, Grantown-on-Spey, by April 3.

April 3. BLYTHING.—Supplying 2,900 tons of road material, consisting of 500 tons of 2¼in. granite, 1,700 tons of 1¾in. granite, 200 tons of granite chips, and 500 tons of broken Norwich flints, to be delivered by July 31, at Saxmundham, Darsham, Halesworth, Leiston, Brampton, Beccles, Wenhaston, Blythburgh, Walberswick, Southwold, Cratfield, and Laxfield stations, and Lowestoft South Quay and Beccles Quay, for the R.D.C. Tenders, by April 3, to Harold A. Mullens, clerk, council offices, Bulcamp, Halesworth.

April 5. WEST ASHFORD.—Supplying about 1,780 yards of either of the following:—Best blue Guernsey, Clee Hill, Aberdeen, Penlee, Basalt, St. Keverne, or Cherbourg quartzite, to be delivered to various railway stations, for the year ending March 31, 1910, for the R.D.C. Further information and forms of tender on application to the surveyor. Tenders, endorsed "Tender for Granite," addressed to the chairman of the West Ashford R.D.C., to be delivered by April 5, to Alfred Sims, surveyor to the council, surveyor's office, Charing, Kent. Samples of material must be delivered free by parcel post only, addressed, chairman, District Council, Union House, Westwell, Ashford, Kent.

April 6. HANDSWORTH, BIRMINGHAM.—Making up Barn Lane, for the U.D.C. All particulars may be obtained on application to the surveyor. Tenders, endorsed "Barn Lane," to be delivered by April 6, to R. Richardson, Assoc.M.Inst.C.E., surveyor to the council. Fair wages clause.

April 6. MALDON.—Supply and delivery of:—1, granite; 2, slag; 3, Kentish flints; 4, picked stones; 5, gravel; for the R.D.C. Forms of tender, conditions, and all particulars of E. J. Ennals, surveyor, 6, Market Hill, Maldon, Essex, where tenders must be delivered, endorsed "Tender for ——," by April 6.

THE

Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:

8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

April 6. MALDON.—Supply and delivery of:— 1, granite; 2, slag; 3, Kentish flints; 4, picked stones; 5, gravel; for the R.D.C. Particulars of E. J. Ennals, surveyor, 6, Market Hill, Maldon, Essex, where tenders must be delivered by April 6.

April 6. CROWMARSH.—Supply of broken granite, flints, and gravel, for repair of highways for year ending March 31, 1910; also cartage and hire of steam roller, with plant, at per day, for the R.D.C. Particulars from Jos. Preston, surveyor to the council, Benson, Wallingford. Tenders by April 6, to G. F. Slade (solicitor), clerk, 7, St. Martin's Street, Wallingford, Berks.

April 6. KILBURN, N.W.—Providing and laying about 6,500 sup. yards of natural rock asphalt in Kilburn Lane and Banister Road, Kilburn, N.W., for the Willesden District Council. Specifications, with form of tender, and all further particulars, upon application to O. Claude Robson, M.Inst.C.E., engineer to the council, public offices, Dyne Road, Kilburn, N.W. Tenders, endorsed "Asphalt Paving," to be delivered by 4 p.m. on April 6, to Stanley W. Ball, clerk to the council, public offices, Dyne Road, Kilburn, N.W. £10 note deposit.

April 8. MORLEY.—Paving and flagging portions of Worrall Street and Scatcherd Lane, for the Corporation. General conditions of contract and specifications, plans, and sections, and copies of the bill of quantities and forms of tender on application to W. E. Putman, Assoc.M.Inst.C.E., borough engineer and surveyor, town hall, Morley. Tenders, endorsed "Private Streets," to the town clerk, F. Thackray, by April 8.

April 17. GOOLE.—Supplying stone, ashes, and asphalt, for the R.D.C. Forms of tender on application to Geo. England, clerk to the council, Bank Chambers, Goole, to whom tenders marked "Tender for Stone," are to be sent by April 17.

April 26. WANDSWORTH.—Making-up and paving part of Acuba Street, Southfield, for the corporation. Specification and drawings, and forms of tender, at the borough engineer's office, new streets department, 56, East Hill, Wandsworth, S.W. Tenders, endorsed "Tender for Paving Acuba Street," at the Council House, East Hill, Wandsworth, S.W., by 4 p.m. on April 26. Fair wages clause.

MISCELLANEOUS.

April 1. BACUP.—Reflooring the lecture hall of the Bacup Liberal Club with maple. Specifications on application to the steward. Tenders endorsed "Flooring," to the secretaries by April 1.

April 2. CHAGFORD.—Providing and fixing 18 new fire hydrants in Chagford, for the Okehampton R.D.C. Specifications on application to Hugh J. Ward, sanitary inspector, Okehampton, or at the parish council office, Chagford. Tenders by April 2, to S. Hawken, clerk to the council, Okehampton.

April 3, THORNABY-ON-TEES.—Supplying for the year ending March 31, 1910, broken whinstone, whinstone stone setts, stoneware pipes, yorks, kerb, cement, smithwork, lamp-posts, gullies, castings, picks, shovels, brooms, coal, pitch, tar, horse hire, cartage disinfectants, horse provender, etc., etc., for the corporation. Specifications, forms of tender, and other particulars, of Chas. T. Johnson, A.M.Inst.C.E., borough engineer, town hall, Thornaby-on-Tees. Tenders at the town clerk's office, Town Hall, Thornaby-on-Tees, by 10 a.m. on April 3.

April 5. WOLVERHAMPTON.—Supplying Portland cement, macadam, broken slag, bricks, brooms, stoneware pipes, sewerage castings, and garden tools, for one year, for the Corporation. Specifications and forms of tender at the office of George Green, borough engineer, town hall, Wolverhampton. Tenders to the town clerk's office, by April 5. Fair wages clause.

April 6. HASLINGDEN.—Supplying (1) ventilating appliances; (2) warm air stoves, in connection with the new infirmary now in course of erection, for the union. All particulars may be had on application to J. H. Sinkinson, clerk to the guardians, union offices, Rawtenstall, to whom tenders are to be sent by April 6.

April 8. MERTHYR TYDFIL.—Providing and fixing vestibule or inner doors and letter-box slits and plates to 88 houses, to workmen's dwellings at Penywern and Twynyrodyn, for the corporation. Particulars and forms of tender from the borough engineer. Tenders, endorsed "Workmen's Dwellings," to T. Aneuryn Rees, town clerk, by April 8.

April 10. SWINDON.—Supply and delivery during the 12 months ending March 31, 1910, for the corporation:—1, stone, kerbing, etc.; 2, timber; 3, pipes and bricks; 4, cement and lime; 5, oils, paints, glass and hardware; 6, iron castings and lamps; 7, dininfectants and chemicals; 8, coal and coke; 9, hauling coal; 10, cast iron pipes; 11, wrought iron tubes and fittings; 12, electrical and tramway equipment accessories, fuse, and service boxes, etc. Forms of tender for items Nos. 1 to 11 and other particulars, on written application to H. J. Hamp, borough surveyor, Town Hall, Swindon. Form of tender and all particulars respecting item No. 12 on written application to the tramways manager, T. Medcalf, electricity works, Swindon. Patterns and samples may be inspected at the Corporation's depot, Cromwell Street, Swindon, and at the electricity works, Corporation Street, Swindon. Tenders by noon on April 10, to Robt. Hilton, town clerk, Town Hall, Swindon.

TELEGRAPHIC ADDRESS:
"BARROWS ENGINEERS, BANBURY"

CODES IN USE.—A.I.
A.B.C. 5TH EDITION.
PRIVATE.

TELEPHONE
Nº 59. P.O.

BARROWS & Co. LTD. ENGINEERS.
BANBURY
OXON

Portable Engines, 4 to 25 h.p. Combined Engine Boilers and Mortar Mills. Plain Mortar Mills and on Wheels, Street Watering Carts and Vans, Street Sweeping Machines Dust Vans and Carts, Road Scrapers. Write for full particulars and Catalogue.

TANK ROOF TO FACTORY 190 ft. by 57 ft.

The Chain Concrete Syndicate.

Constructional Engineers in Reinforced . . Concrete. . .

The most complete system in existence.
Every Member, Tension or Shear, RIGIDLY FIXED.
No Loose Bars to be misplaced during Concreting.

Fireproof Floors, Flat Roofs, Reservoirs, Culverts, Bridges,
Write for Pamphlet—

1, Basinghall Square, LEEDS, and Carlton Street, CASTLEFORD.

Appointments Wanted.

The charge for Advertisements under this heading 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE architect prepares designs, perspectives, working drawings, etc., on moderate terms.—W., 6, King's Road, Kingston-on-Thames. 4918

ABLE ASSISTANCE rendered, drawings, tracings, photo-prints prepared, plans from rough sketches, specifications, etc.—Yorkshire Drawing Office, 21, Scale Lane, Hull. 4940

ADVERTISER (28), seeks re-engagement, ten years' thorough practical knowledge of building, estate management, and repairs, etc.; experienced in preparing plans and estimates, including quantities, for new works: highest refs. — Y., 86, Coniston Road, Muswell Hill, N. 4805

ADVERTISER (20), three years with Quantity Surveyors, wishes to enter Builders' Office (preferably estimating department); excellent testimonial; very low commencing salary, with good prospects. —E., 2, St. Mary's Road, London, S.E. 4960

APPOINTMENT as Improver (19), prob. R.I.B.A., just completing three years' articles with an architect and surveyor; small salary to commence; highly recommended.—H. Cullerne, "Bridge House." Lugwardine, Hereford. 4911

ARCHITECT'S Assistant (28) seeks situation; thoroughly competent in all design and construction, including steelwork and ferro-concrete; details, specifications, quantities, surveying; eleven years' experience; manage office; permanency preferred; excellent references.—Apply, at first, Box 4954, Builders' Journal Office.

ARCHITECTURAL Draughtsman, thoroughly experienced in designing steel and ferro-concrete work, factory chimneys, retaining walls, foundations, overhead gantries, and all constructional work is open to assist or consult architects by correspondence.—Box 4927, Builders' Journal Office

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECTS, Builders, etc., draughtsman (19), used to general work, fill up time in office; good references.—F. J. Williams, c/o F. Cundall, Architect and Surveyor, 34, Parade, Leamington Spa. 4878

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. 4[illegible]

ARCHITECT'S Assistant (27), excellent draughtsman and colourist; contract drawings, specifications, details, design, perspective, surveys, etc.; travelling studentship winner; highest refs.—Box 4902, Builders' Journal Office.

ARCHITECT'S Assistant (23) desires engagement, town or country; excellent draughtsman; good general experience; first-class references.—Box 4937, Builders' Journal Office.

ARCHITECT'S Assistant (26), desires engagement at moderate salary; good draughtsman.—Address, Young, Narellan, Old Colwyn. 4950

ARCHITECT and Surveyor's junior assistant (19), desires engagement; surveying, levelling, etc.; office routine; salary 15s.—Box 4930, Builders' Journal Office.

ARCHITECT'S Assistant (25), R.I.B.A. exam., nine years' thorough practical experience, design, working drawings, details, specifications, estimating, quantities, levelling, perspectives, etc.; sal. moderate.—Apply, Box 4900, Builders' Journal Office.

ARCHITECT'S fully qualified Assistant and Quantity Surveyor, energetic and experienced, desires immediate engagement, temporary or otherwise; competition expert; highest references; salary moderate.—W. B., 156, Warwick Road, Birmingham. 4935

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

ARCHITECT'S Junior Assistant, 5½ years' experience; disengaged; working and detail drawings, typewriting, knowledge of perspective; moderate salary.—W. L. Francis, 11, Middleton Road, Ilkley, Yorks. 4891

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, Builders' Journal Office.

ASSISTANT Surveyor seeks re-engagement; 9 years with City firm; highest testimonials; surveys, levels, estate management, etc.; shorthand if required; moderate salary.—K., 21, First Avenue, Manor Park. 4917

ASSISTANT, provincial experience, good planner and designer, domestic Renaissance, working drawings, details, surveying, competitions; excellent draughtsman, A.R.I.B.A. at one sitting; age 27.—Box No. 4928, Builders' Journal Office.

BUILDERS' Assistant desires situation; thorough knowledge plans, specifications, quantities, measuring; not afraid of work; salary not so much an object as permanent situation; 21; 5 years' experience.—Box 4839, Builders' Journal Office.

BUILDER and contractor's estimating and managing clerk seeks berth, exceptionally good all-round qualifications, acquired by sound London and provincial experience, and a reliable and successful estimator, including sewerage and kindred works; good references.—T. C., 3, Hampton Terrace, Brighton. 4933

BUILDER'S or Architect's Junior Assistant (18), good tracer, well up in prime cost, and general office work; excellent references; three years' experience. — J. W., 164, Wellesley Road, Ilford, Essex. 4833

BUILDER (38), life experience, seeks engagement as Building or Estate Clerk of Works or Builders' General Foreman; thorough knowledge of plans, details, quantities, and accounts; accurate setting out; good manager all trades.—Box 4958, Builders' Journal Office.

BUILDER'S clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N. 4883

BUILDING Exhibition.—Young architect is prepared to assist exhibitors at the above; can reach same daily; terms low.—Box 4925, Builders' Journal Office.

BUILDING Trades' Exhibition, 1909.—Gentleman, with wide architectural experience, offers services to provincial or other exhibitors as representative at their stand; for terms apply Box 4931, Builders' Journal Office.

CARPENTER and Joiner desires sit.; bench, building or estate, or other suitable capacity; experienced; good refs.; age 30.—R. H. W., 24, Thorncroft Road, Fratton, Portsmouth. 4908

CLERK of Works, desires re-engagement, possessing first-class testimonials for ferro-concrete construction, also from Metropolitan Borough Councils, eminent architects and engineers; age 45.—Box 4922, Builders' Journal Office.

CLERK of Works, shortly disengaged, well up in all trades, best London references; abstainer.—R.E., 2, William Road, Guildford, Surrey. 4938

DRAUGHTSMAN (junior), 5 years' experience in structural engineers, good knowledge of constructional and ornamental work, details, quantities and estimating; shop experience.—M.D., 74, Bartholomew Road, London, N.W. 4884

DRAUGHTSMAN, neat, quick tracer, working drawings from rough sketches, good colourist; shorthand, typing, etc.; about 12 years' varied experience; terms moderate.—Box No. 4889, Builders' Journal Office.

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, Builders' Journal Office.

FOREMAN Painter (working) seeks re-engagement); experienced in all class work in building trade, as for general alterations, etc.; good supervisor, and reliable; either town or country; abstainer.—X. Y. Z., 8, Barton Street, Westminster. 4807

GENTLEMAN, with office in Glasgow, splendid connection among architects, builders, etc., is open to represent one or two good firms; first-class references given.—Box 4893, Builders' Journal Office.

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W.

MANCHESTER district, architect's draughtsman gives temporary assistance; experienced planner and designer; contract, detail or competition drawings.—Box 4949, Builders' Journal Office.

OUTDOOR representative, surveyor's assistant (25), disengaged, requires appointment; had experience interviewing, canvassing, knows London well; well educated, and of good address; first-class references.—Box 4952, Builders' Journal Office.

PARTNERSHIP.—Gentleman with practical knowledge, desires post in sanitary engineering business with view to partnership.—Address, Engineer, 1, Creighton Avenue, Muswell Hill, N. 4942

REINFORCED CONCRETE.—Details, drawings, calculations, and assistance generally, rendered to architects, builders, etc., by a specialist of large experience; terms moderate.—Box 4887, Builders' Journal Office.

SURVEYOR'S Assistant seeks re-engagement, 9 years with City firm; highest references; surveys; levels, estate management, etc.; shorthand and typewriting, if necessary. — J. P. K., 21, First Avenue, Manor Park, Essex. 4873

TO Builders.—Experienced, practical Builder Surveyor undertakes preparation of estimates and settlement of accounts on reasonable terms.—Box 4957, Builders' Journal Office.

TO Estate Owners, builder, experience, in all trades, desires position as manager (working or otherwise); plans prepared, quantities, setting out, accounts and supervision; abstainer; country preferred.—Box 4806, Builders' Journal Office.

WORKING shop foreman seeks re-engagement, thoroughly practical and reliable carpenter and joiner; abstainer; 7 years' ref.; age 38; wages moderate.—C. M., 16, Margett's Road, Kempston, Bedford. 4932

YOUNG Architect is prepared to assist others, at his own office or otherwise; mod. terms.—Box 4926, Builders' Journal Office.

Appointments Vacant.

A START in Life,—Vacancy for youth as pupil; moderate premium required, in a county architect's office.—Pryer, Clarence Street, Gloucester. 4947

ARCHITECT required to represent a large West End firm of contractors; must be a qualified man and be willing to call upon architects as representative.—Apply Box 4955, Builders' Journal Office.

ARTICLED Pupil—Reinforced Concrete. Required a young gentleman as articled pupil in reinforced concrete specialist's office, one with a knowledge of elementary applied mechanics, and mathematics and a taste for theory of construction and design preferred; an excellent opportunity for one willing to learn and understudy chief engineer.—Write, R. C., c/o Hastings Bros., Ltd., King's Chambers, Portugal Street, Kingsway, W.C. 4907

ARTICLED PUPIL.—Vacancy for same in old established West End firm of architects and surveyors; moderate premium; small progressive salary to suitable youth.—Box No. 4890, Builders' Journal Office.

REINFORCED Concrete or Steel Construction.—Wanted, competent Assistant Engineer or Draughtsman, capable of making calculations, taking out complete quantities, and preparing drawings and details; state qualifications and salary required.—Box 4953, Builders' Journal Office.

WANTED, Joiners' Foreman, for London shop of 20 men; able to estimate and work accurately to cost; used to machinery.—Box 4936, Builders' Journal Office

JOINTLESS Floor Layers. — Wanted immediately, one or two good men, thoroughly experienced in composition floor-laying.—Apply, giving experience and wages required, Box 4946, Builders' Journal Office.

WANTED, competent reinforced concrete hands, experienced enough to act as sub-foremen.—Write, stating wages required, to D.N., Box 4944, Builders' Journal Office.

WORKING Foreman, good setter out, able to cope with contract work; take full control of all branches if necessary; good manager; trade carpenter and joiner; state wages and send copies of recent testimonials.—Apply Box 4959, Builders' Journal Office.

April 7, 1909. Volume 29. No. 739.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: The National Theatre; "Mad on Flat Roofs"; Einkuechenhauser, 287; Apotheosis of Carving - 288
Bath and Bury - 288
The A.A. Play: a Modern "Morality" - 288
A New Terror to Architects - 290
Our Plate - 290
American Architecture, with Especial Reference to Work at Washington. By Francis S. Swales - 290
Enquiries Answered: Green Distemper; Civil Service and L.C.C. Appointments, 292; Rights of Light Question; Platform for Drilling and Gymnastics; Strength of Floor; Continuous Louvres and Gear for Working Them; Old Book on Carpentry; Removing Stains from Pavement, and Cleansing Closet Trap, 293; Sewerage Powers, 293; Ascertaining Price of Timber Scantlings; Point in Practical Acoustics; Current Domestic Work; Employment on the Ordnance Survey; Stability of Reservoir Wall - 294
Notes on Competitions - 295
Societies' Reports - 295
Decorative Plasterwork - 296

CONTRACTORS' SECTION.

Some Pros and Cons of the Intertrading Rule 297
Ascertaining the Value of Fire Bricks and Blocks. By Alfred B. Searle - 298
Notes on Painting and Decoration - 298
Paint and its Application to Structural Steel. By Gaston Depierres - 301
The Federation Who's Who - 302
Timbers of Commerce: Sources of Supply - 304
Coming Events - 304
National Federation Monthly Reports - 305-311
The Master Builders' Association of New South Wales - 312
Trade and Craft - 312
Tenders - vi.-viii.
Complete List of Contracts Open - xxiii.-xxv.

ILLUSTRATIONS.

The Architectural Association at Play Sketches by Our Special Artist at the Production of "The Rise and Fall of Architecture" - 289
Proposed Footbridge over the River Wey, Guildford. Design by Davies and Swayne (see also Centre Plate) - 291
Platform for Drilling and Gymnastics - 293
Reservoir Wall - 294
Ground Plan of the Hellenic House (Delos), according to Vitruvius - 295
Residence, Dunedin: Basil Hooper, A.R.I.B.A., Architect - 299
Federation Who's Who: Mr. Stephen Easten, Mr. James Denver, Mr. William Bullen, Mr. John Tomlison, 302; Mr. W. R. Thompson, Mr. John Davison, Mr. W. H. Hope - 303
Cottages, Whitley Wood, Berks: C. B. Willcocks, Architect. Centre Plate.

The National Theatre.

The munificent gift, by an anonymous donor, of £70,000 towards the movement for erecting and endowing a National Theatre as a memorial to Shakespeare was announced by the Lord Mayor, at a meeting of the general committee held at the Mansion House on March 23rd. Literature and art were well and worthily represented at this meeting, and the executive committee's main recommendation, to the effect that the proposal to proceed with the erection of a theatre was a practicable and desirable one, was carried with what, in the circumstances, amounted to almost unprecedented unanimity. Although it is estimated that no less a sum than half a million sterling will be required for the construction, equipment, and endowment of a suitable building, yet the movement for the establishment of a National Shakespeare Theatre may now be regarded with some measure of confidence as being on the high road to success. For when so popular a scheme as the one now under discussion has assumed tangible shape, there is little doubt that a liberal and ready response will be made to the committee's appeal for funds. Thus full, if somewhat tardy, justice will be done to the memory of the patriotic poet whose passionate love for his native land—that "precious stone set in a silver sea"—has, in perhaps no less measure than his mighty genius, endeared him for all time to English-speaking people. Lord Lytton expressed the hope that the £500,000 required would be forthcoming to enable the theatre to be built and endowed in time for the Shakespeare Tercentenary in 1916, and other speakers took a still more encouraging and sanguine anticipatory view with respect to the immediate success of the scheme. Probably the majority of our readers will agree with us in thinking that, on the whole, the best and wisest choice has been made by the committee in determining that the National Shakespeare Memorial shall comprise a building primarily intended to enable the poet's fellow-countrymen to enjoy "the infinite variety" of his writings. Presented, with the extraneous assistance of artistic accessories, by the best exponents of histrionic art, and with a scholarly appreciation of Shakespeare's aims and intentions, the value of which it would be impossible to over-estimate, the poet's art, the philosopher's wisdom, the humourist's wit—in fact the *universality* of the genius of Shakespeare—should be turned to good account in a theatre from which the spirit of commercialism will be absent. We can but congratulate the committee upon the happy choice it has made in the form of the memorial to our national poet. But our appreciation of Shakespeare's mighty genius must find expression in a suitable building. It might appear to some of Shakespeare's admirers that, at least externally, the National Theatre should recall in some measure the picturesque aspect, the long mullioned windows, projecting bays, and high-pitched roofs of late Elizabethian architecture. But as a revival of that period of art has been tried already and found wanting, we may reasonably expect to find the Shakespeare Memorial Theatre clad in the semblance of the *real* Renaissance. In that event, provided the approved design is tolerably free from that incongruous mixture of elements due to the fancy (not to the scholarship) of their designers, which is the bane of most modern work, we shall not be disposed to take exception to the architectural style selected. We sincerely trust, however, that the committee will be sufficiently well advised to insist upon a less offensive scheme of internal decorative treatment than that usually associated with theatrical buildings in this country.

"Mad on Flat Roofs."

Birmingham Education Committee has had what a local paper calls "an amusing discussion" on the flat roof question. Presumably the amusement was relative rather than absolute, dependent on environment rather than on inherent quality—like a joke from his Lordship on the Bench; for in cold print the fun seems to have evaporated from the passages obligingly marked ("Laughter"). Mr. Bethune Baker proposed that in the plan for a new school in Sladefield Road, a flat concrete roof should be substituted for a slate one. A flat roof on the Oldknow Road Schools, he said, had been found cheaper than slate in the upkeep. Councillor Manton "had the strongest objection to this innovation. There was a tendency to go mad on flat roofs just now (laughter)." The ambiguity of the phrase seems hardly to excuse the laughter. Perhaps some sly local allusion was implied. Councillor Titterton said "it seemed to him the drawings were intended for a lunatic asylum (laughter). He hoped the chairman of the sites and buildings would withdraw the plans and have something more eyeable. (laughter)." Was this laughter ironical, excited by the Councillor's verbal coinage? The Lord Mayor said that if, as Mr. Manton had declared, there was a tendency for people to go mad on flat roofs, he (the Lord Mayor) trusted that, if they did erect one, steps would be taken to see that no one had access to it (laughter)." Mr. Manton, since the Lord Mayor was playfully disposed "to try confusions with him," might justly have retorted with the not impertinent question, "What steps?" which joyously recalls a merry moment in this year's A.A. play: "Pro: What steps did you have to take to obtain these—er—refinements?—Foreman: Well, we 'ad to take the front steps and do orl sorts of funny things with 'em." These figurative expressions put a premium on frivolity. The Lord Mayor thought that the "madness" might be fittingly retorted on "those people who believed no roof could be satisfactory that was not a steep one. For years he suffered from that frightful delusion, but he had now discovered that the steep roof accumulated snow until it became positively dangerous, and then shot it down on to the roof of the greenhouse and made a large hole in it (laughter)." Was this unholy laughter, excited by the Lord Mayor's misfortune, or by the glazier's opportunity? The Lord Mayor suggested that the reason why our ancestors did not build concrete roofs was because they had not material of the proper character. If that was only one reason out of many, it was nevertheless as cogent as the twenty-fifth reason urged by the naval officer for failing to fire a salute—he had no powder. The recommendation to put in a flat roof was adopted by twelve votes to eight, five members remaining neutral. The kind of roof adopted for the Sladefield Road School is without general interest *per se*. But it is instructive to show, by occasional typical examples, in what manner and in what spirit such matters are discussed by local authorities, as well as to note their decisions, which may occasionally mark the trend of the movement in building.

Einkuechenhauser.

New housing developments in Germany are worth watching. A few weeks ago we published an illustrated account of a sort of cooperative shop-keeping system in which, in a specially constructed building, many traders have agreed to pool the common services, such as clerical work, despatching of goods, and other matters that are usually managed independently, and consequently much less economically and with less efficiency than is developed with concentration. The theory seems excellent, though whether the practice will justify sanguine expectation, depends on the extent to which the participants are able to suppress the little human weaknesses that make for disruption. The same observation applies to the central cooking-house arrangement that is reported to be in course of extensive adoption on the outskirts of Berlin. The huge apartment hotels of New York have perhaps suggested the German experiment; but whereas in the apartment hotel the residents dine in a common restaurant, the occupants of the Einkuechenhaus of Berlin may take their meals in their own rooms, but will receive them from a central kitchen. The most up-to-date flat-houses of this type, however, are stated by a Berlin correspondent of the "Westminster Gazette" to "combine the flat carried to the extreme of convenience, the popular restaurant, the social club, and even the kindergarten school." Most of the flats have small kitchens for emergency use; but the idea is to do away with private housekeeping as far as table-supply is concerned, and incidentally with the private cook and her retinue, and with the necessity for "marketing." The average flat, we are told, costs £15 per room. It is gratifying to learn that these Einkuechenhauser are being tastefully built, with an avoidance of the meretricious ornamentation that disfigures the general run of Berlin dwellings. The system of common kitchens may perhaps commend itself to a small section of the community in Britain; but it is no more likely to become extensively adopted than is the system of common counting-houses and despatch departments. Britons are too individualistic or independent of temperament to combine amicably in schemes that would sometimes, it may be supposed, require more "give-and-take" than we are accustomed to exhibit either in domestic or in business relationship. It is for this reason that flats are going out of favour in this country; where the common-kitchen system is hardly likely to restore their vogue.

Apotheosis of Carving. Mr. Bertram Mackennal, A.R.A., has attained to the highest distinction that it is in the power of his fellow-commoners to bestow. They have held a dinner in his honour. It will be remembered that in January last he was elected an Associate of the Royal Academy, when Mr. John Belcher and Mr. Goscombe John were elected R.A.'s. Mr. Mackennal was born in Melbourne forty-four years ago, and is said to be the first Australian sculptor to win the distinction of an Associateship. It was his Australian compatriots who arranged the dinner, but this was a mere accident. As Mr. Mackennal himself gently reminded his hosts, in acknowledging the fine eulogy pronounced by Lord Tennyson, as chairman, art is cosmopolitan. Mr. Mackennal's career illustrates this proposition. He began his studies in his native city, continued them in Paris, and is maturing them at St. John's Wood, even there, where artists most do congregate. It may be that he has still to do his best work; but already he has given us so many good things—notable among them being the war memorial at Islington, the allegorical group on the Government buildings at Westminster, the Rodinesque "Circe," and the noble bust of Sir William Howard Russell in the crypt of St. Paul's Cathedral—as to justify very amply the Academical distinction and the dinner.

BATH AND BURY.

Our remarks in last week's issue on the threatened mutilation of Bath Street, Bath, were not, it seems, sufficiently emphatic. At least, we have received a mild and courteous remonstrance which seems to convey that imputation. Yet we think that, while it is certainly true that we endeavoured to give a fair presentment of both sides of the question, we made it quite clear that in our opinion the protest against the proposed demolition is well grounded in reason, and that on this subject we are most decidedly in agreement with Mr. Ernest George, Sir Aston Webb, Mr. Reginald Blomfield, and Mr. Mervyn Macartney. The last-named gentleman has made the very apt and opportune observation that: "At the present juncture, when the attention of the Local Government Board is being drawn to the necessity of comprehensive and sane Town Planning, when the public is slowly awakening to the possibilities of civic architecture, when architects themselves are tentatively advocating the necessity of a return to our traditional Palladian architecture to improve our streets, it is a curiously inopportune moment to inaugurate schemes tending to the destruction of monuments in this style. And almost alone in this country, Bath possesses elements of great style in its planning, which make it the finest model for all those interested in town planning." With the gist of this eloquent plea we are in the most hearty agreement. Also we find ourselves in sympathy with the citizens of Bury St. Edmunds, who have petitioned against the Corporation's intention to destroy certain characteristic features of their town hall. The elevation is decorated on the east and west sides with urns or vases in niches, which are strongly characteristic of the treatment beloved of the brothers Adam, who designed the hall. These it is proposed to remove, in order that windows may be inserted. It seems, however, that the requisite light can be obtained without interference with the vases, and we have therefore the less hesitation in regarding this as another instance in which, as in the case of Bath, the protest is rational and architectural rather than perfervidly archæological, and that it is therefore worthy of all the support we can give it.

The annual congress of the Central Society of French Architects is announced to take place in June next from the 21st to the 26th.

* * *

Our Edition de Luxe Building Trades Exhibition number will be published on April 21st. Further particulars will be announced next week.

* * *

Prof. Henry Adams, M.Inst.C.E., etc., of 60, Queen Victoria Street, London, E.C., has taken his eldest son, Mr. Henry Charles Adams, A.M.I.C.E., A.M.I.M.E., A.M.I.E.E., etc., into partnership with him in his practice as a consulting engineer and surveyor, under the style of Henry Adams and Son, at the above address, their Birmingham office being at 1, Waterloo Street. After serving articles to his father some eighteen years ago, Mr. Henry C. Adams migrated to Birmingham, where he was engaged as a special engineering assistant in the service of the corporation of that city, and in various other public and private appointments.

* * *

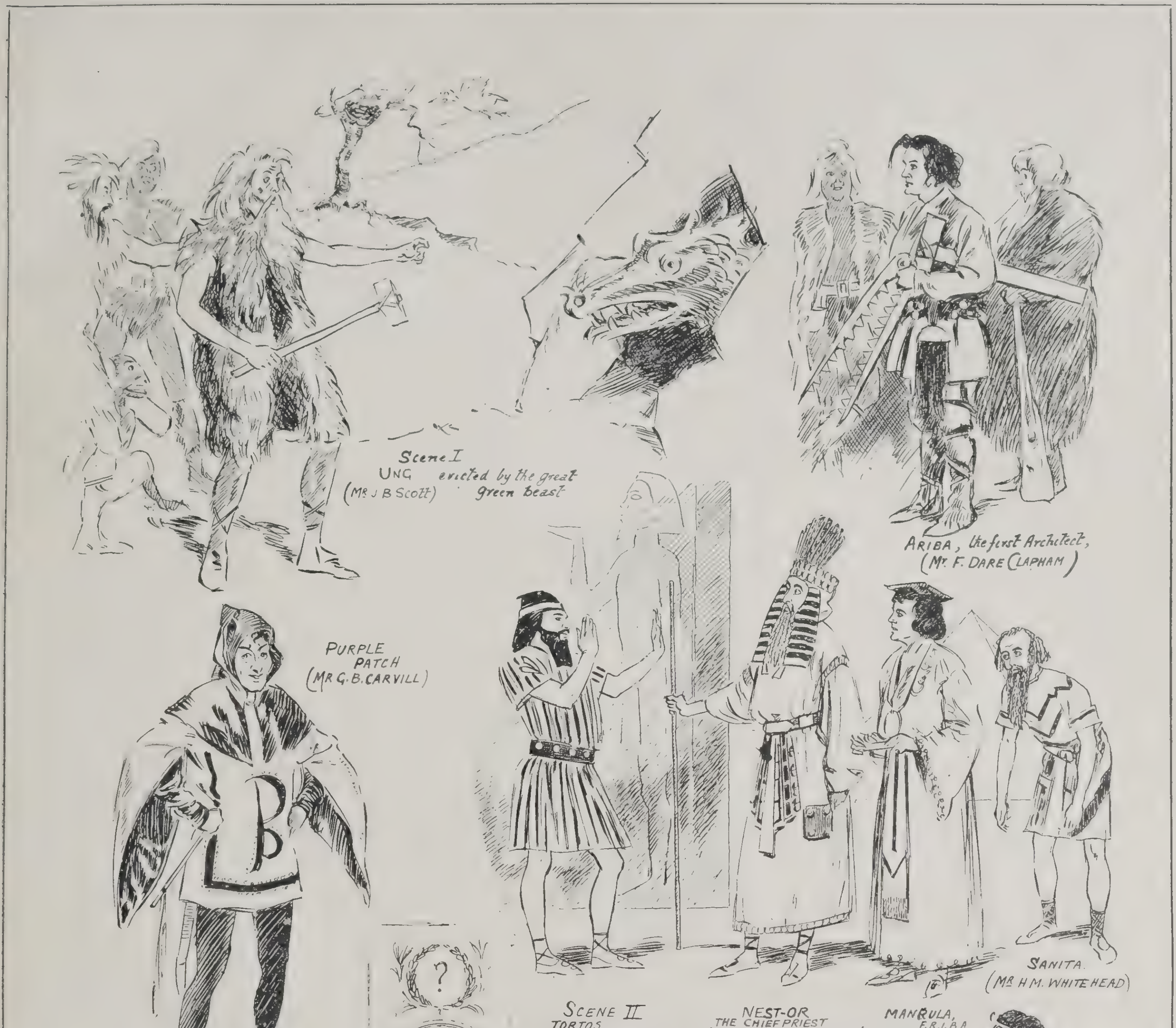
The type of barracks or temporary dwellings adopted in Italy by the Ministry of Public Works, for the accommodation of those whose homes were destroyed in the earthquake, is a wooden house of 4 mètres by 8 mètres, with a brickwork kitchen annexe, measuring 3 mètres by 1.90 mètres. The walls and the roofs are of double or cavity character, the former resting on brickwork 50 centimetres thick and 70 centimetres high. Each house, and each annexe, is divided longitudinally by a partition into two apartments of equal size, and to each house there are two doors and two windows at the front, with two roof lights to the annexe. The roofs are covered with sheet-iron and tiles.

THE A.A. PLAY: A MODERN "MORALITY."

It is the natural ambition of every architect to see his imaginings materialise in three dimensions. That were surely a sufficient excuse, if any were needed, for the annual production of an A.A. play; and the apology prefixed to the book of the words of this year's play—"Once more we have to apologise for inflicting upon our readers another violation of the Dramatic Unities"—may pass for an urbane convention. The play was altogether delightful, and was stupendously successful. It was, of course, intensely topical. The "devastating epidemic of Pageants" suggested the ground-plan. In the prologue, sung by Mr. G. Carvill ("discovered sitting on a rock pensively playing on the pan-pipes"), the superstructure is summarily described: "As I take you through the ages, turning over history's pages, Every age seems very similar to this; Builders' contracts never paid, lady clients all upbraid, And we sometimes make our 'mark' through a 'miss.' In the Future, and the Present, and the Past, Essentials all are very much the same; Yet if life's a ball worth rolling, It's at any rate consoling To know that other people knew the troubles of the game! In Act I. we show that 'Art' isn't wanted at the start, Simply 'Cheek!' Then, as Art becomes a fact, we require a little 'Tact'—Just a streak. But when Art its summit reaches, true 'Forbearance' great it preaches: Act II. will show you symptoms of its wane. Dilettateism spread—in Scene V. our Art is dead; Try 'Advertisement.'"

The play opens with a chorus of apes and prehistoric men. Ung is a neolithic evicted tenant, who, driven from his cave dwelling by a great green monster, is in miserable plight. "Where we're to sleep, I'm blessed if I know. Not a casual ward for miles! Oh for the merry and Poplar days of good King Edward and the palatial workhouse!" The apes point to the tree as offering a solution of the difficulty, and Ung thinks this a good idea. His son Boo, however, chides severely this momentary weakness: "Papa, I protest. You forget your descent—the Descent of Man. From that tree we sprang down to the ground; and assumed a position in society—an upright position." Papa continues to yearn for "Letchworth and the simple life," and says to Boo: "As for you, I'm almost tempted to call you a snob." Boo admits the soft impeachment, and glories in the accusation. Snobbery is his distinctively human characteristic. "Papa, when you left that tree you were yourself a snob; when grandfather Missing-Link insisted on starting life without a tail he was a snob." Presently there enters Ari-Ba "hung about with prehistoric tools of an architectural character," and displaying an ingratiating smile. He explains that the tools fell at his feet from the skies, and he hasn't the foggiest idea what to do with them. Purple Patch, the dæmon of the play, had told Ari-Ba that the Gods had decided to found a new profession, or art, as all the others were so overcrowded. When Ari-Ba makes his confession of complete ignorance, Purple Patch gives him this moral advice: "Don't give away your ignorance. Cheek is what you want at the start. Many an architect has started with less knowledge than you." He gives Ari-Ba "a valuable work of reference" which may help him in his career; and Ari-Ba, having read merely the title, "How to Treat a Client for a Shilling," puffs out his chest and declares that as the first architect he is prepared to build the first house. It is built forthwith, on the stage; Ari-Ba remarking of the design: "I have used considerable restraint in this, Mr. Ung. You will observe that the merits of the design, such as they are, rest upon a simple use of the plainest materials, with a careful consideration of the general masses." These prehistoric platitudes captured the prehistoric client.

The second scene is Egyptian. Time, in the reign of Queen Hatezu, of the ⅛ scale



THE ARCHITECTURAL ASSOCIATION AT PLAY. SKETCHES BY OUR SPECIAL ARTIST AT THE PRODUCTION OF THE "RISE AND FALL OF ARCHITECTURE."

dynasty, 1909 B.C., who having risen to the throne "on the crest of the wave of the new and the powerful feminine party, Would build a fair temple to Christabel, yea, and to all of the Pankhursts." The Ari-Ba of the first scene has now become Manrula, who finds the queen a very difficult client. What to do? Again the advice of Purple Patch is given: "For those but newly entering on their career, An impudence quite imperturbable is right; But having reached to some estate, 'tis different then. . . What you require is TACT." That's "a quality which all of us require, Without which you may easily be wrecked; 'Tis useful to a monarch or a coster, But it's very vital to the Architect." Manrula is to build the temple without paying any regard to the vagaries of the queen, who is to be tactfully persuaded that she herself is nevertheless the author and finisher of this beautiful building.

In Scene III. we are at the Greek period. Pericles is presiding at an arbitration court on the Acropolis. He explains the situation in a song: "My builder and the Architects, The men who built the Parthenon, Have lately had a horrid row—That's why we all are here just now. Oh, botheration! They actually have thrust on me A beastly Arbitration." Manrula has now become Callicrates, P.R.I.B.A., with a partner, Ictinus, "bit of an outsider, you know, and no feeling for art, but very useful." The sum of 30,000 drachmæ is claimed from Bryx, the builder of the Parthenon, under the penalty clause for delay. It was also complained that the building was not up to specification. There was trouble about the sculpture. Phideas was called as a witnesss, and sworn to tell the naked truth. Witness alleged that the figures were all fit when they left his studio, but the builder had cut them down. The builder sprang up protesting, "I had to cut them down. I'm a respectable tradesman and a married man. They were simply scandalous." Phideas: "Scandalous, indeed! You ought to have seen the ones I did for the Temple of Aesculapius!" —a cunningly insinuated topical allusion that brought the house down. Counsel explains the nature of the builder's counterclaim. It was "for extra work involved owing to the apparently unnecessary refinements on which the Architect insisted: columns out of plumb, all straight lines worked to curves, the building narrower at the top than at the bottom by 3·272 digits. Details, my lud, not even mentioned in the specification." But after the very funny evidence of the clerk of the works, the builder's foreman, and two expert witnesses, has been heard, and when things have been twisted into a rather bad tangle, enter again the deus ex machina, Purple Patch, who says: "It is natural, O Callicrates, for you to thirst for the builder's blood, but oh! be content to bleed your client instead. But even as I counselled impudence when your practice began, as I counselled tact as it grew, now I would remind you, in the plenitude of your power, that you can afford to be merciful, even to the point of kind words at prize-givings, and the voicing of high ideals to students." The builder's excuse for the delay is that while the work was in progress (or ought to have been), he was courting, and his sweetheart "chatted on the scaffolding the whole day long. . . Each day seemed shorter than the day before—My work grew less as my love grew more." The judge adjourns the court in order that he may have an opportunity of seeing the girl.

Act II., Scene I, introduces us to the Middle Ages, with an abbey a-building, and the Abbot (our old friend Ari-Ba, now Sir Thomas de Tufton), as architect. Unemployables complain bitterly of the importation of foreign workmen. Citizens complain that the rising tower is infringing their rights of light and air. An urban district surveyor serves injunctions, but is appeased by the auro-concrete method, as suggested by Purple Patch. Scene 2 shows us Joseph Addison at his wit's end for a subject for the next number of the "Spectator." Having exhausted all other forms of foolishness, he decides on Architecture, but is soon at a loss for ideas. To him comes Purple Patch. This delightful scene ends with a song by Addison, bewailing the unrequited toil of the architect's ghost.

In the last scene of all this strange eventful history, Ari-Ba has become Snatchall, competing for a £500 cottage in the "D.M." competition for an Ideal Home. He finds that his designs are being pirated by a Scotchman, who dances a reel and sings a song both in the manner of Mr. Harry Lauder. There is a good deal of good-humoured satire on practice, malpractice, and personalities of to-day. Purple Patch's advice is, throughout and to the bitter end, of the sardonic order. He ends with a song: "Oh, you architects, you must be going blind. Can't you see you're getting left centuries behind? Your antiquated methods do not pay. The wholesale art-providers soon will have you on your knees." And another character closes the play with: "While you talked of Art, We played the part, And took the practice too."

Truly a merry trifle, and cunningly enacted withal! but through it all there runs something too much of the grim cynicism of the Morality play; and the non-moral affectations of the principal characters intensified the parallel.

A NEW TERROR TO ARCHITECTS.

It has recently come to our knowledge that at the annual pantomime celebrations of the students of Liverpool University, held on February 11th, the usual procession through the city was headed by the architectural students in a four-in-hand. The turn-out, which included liveried attendants (one armed with an eighteenth century coach-horn), attracted considerable public attention, and the popular interest was further increased by the frequent stoppages made outside various buildings, for the purpose of cheering or hooting them, according to the pleasure of the critical occupants of the coach. Thus, the Town Hall, by Wood, of Bath; Cockerell's, "Bank of England," in Castle Street; "The Athenæum"; St. George's Hall; and several other monuments of the Greek Revival, besides the statues of Michael Angelo and Raphael, flanking the entrance to the Walker Art Gallery, were greeted with the wildest enthusiasm, whilst some more modern products received equally sincere abuse.

Though the demonstration obtained an amused toleration from the man-in-the-street, it is not impossible that some of our present-day practitioners might have been less benignantly disposed.

Our Plate.

Cottages, Whitley Wood, Berks.

These cottages, which are now being built, are to be faced with purplish red bricks, the roofs being covered with irregular sand-faced tiles. The external woodwork is to be stained green, and the internal woodwork brown, with "Antirot." The cost of the cottages works out at slightly under 5d. per ft. cube. The builder is Mr. A. G. Harradence, of Reading, and the architect Mr. C. B. Willcocks, of Caversham, Oxon.

Proposed Footbridge Over River Wey.

This design by Messrs. Stuart H. Davies, C.E., and Gerald Swayne, A.M.I.C.E., of Westminster, was placed second in the recent competition.

The bridge has a span of 60ft., and allows 8 feet of headroom over the towing path, and 13 feet 9 inches over the centre of the river.

The footway is carried on arched ribs, which are built up in double segments, about 15 feet long, each segment breaking joint in the middle of the one above or below it. The segments are bolted together at the joints with pairs of ⅞in. bolts seated upon W.I. dovetail plates sunk flush in each edge of the rib. The arched ribs are tied together with 1⅛in. W.I. bolts and stiffened with 6in. by 6in oak wind-braces. The flooring consists of 2in. oak planks, spaced slightly apart. Oak to be used throughout.

AMERICAN ARCHITECTURE: WITH ESPECIAL REFERENCE TO WORK AT WASHINGTON.

By Francis S. Swales.

Abstract of a paper read before the Royal Institute of British Architects Monday, March 15th, 1909.

When I was asked to give a paper upon American architecture before this Institute, I recognised that I owed this compliment to the fact that I was known to members of your Council as having lived for so many years in America that my point of view might be expected to be that of the American, and that in limiting the subject in order to make it possible to be dealt with in the hour placed at my disposal I might naturally confine my paper to some subject in which I should believe American architects themselves to be especially interested. I knew, too, that it is characteristic of British generosity to expect to have to take into account the natural shortcomings of the foreign point of view, and to be rather indulgent with it—and I think the foreigner rather expects the indulgence—and I ventured to think I might interest you in a brief study of architecture as it has been, as it is, and as it will be in the United States, having especial reference to work at the national capital—Washington, in the district of Columbia.

Pierre Charles L'Enfant.

During the War of Independence, the French colonists lent their moral and material support to the American revolutionists, and France herself became their ally, and her subjects contributed most of the military skill and engineering that came to the assistance of Washington. Among these, one of the first to tender his services was Major Pierre Charles L'Enfant, who soon distinguished himself for conspicuous ability as a military engineer.

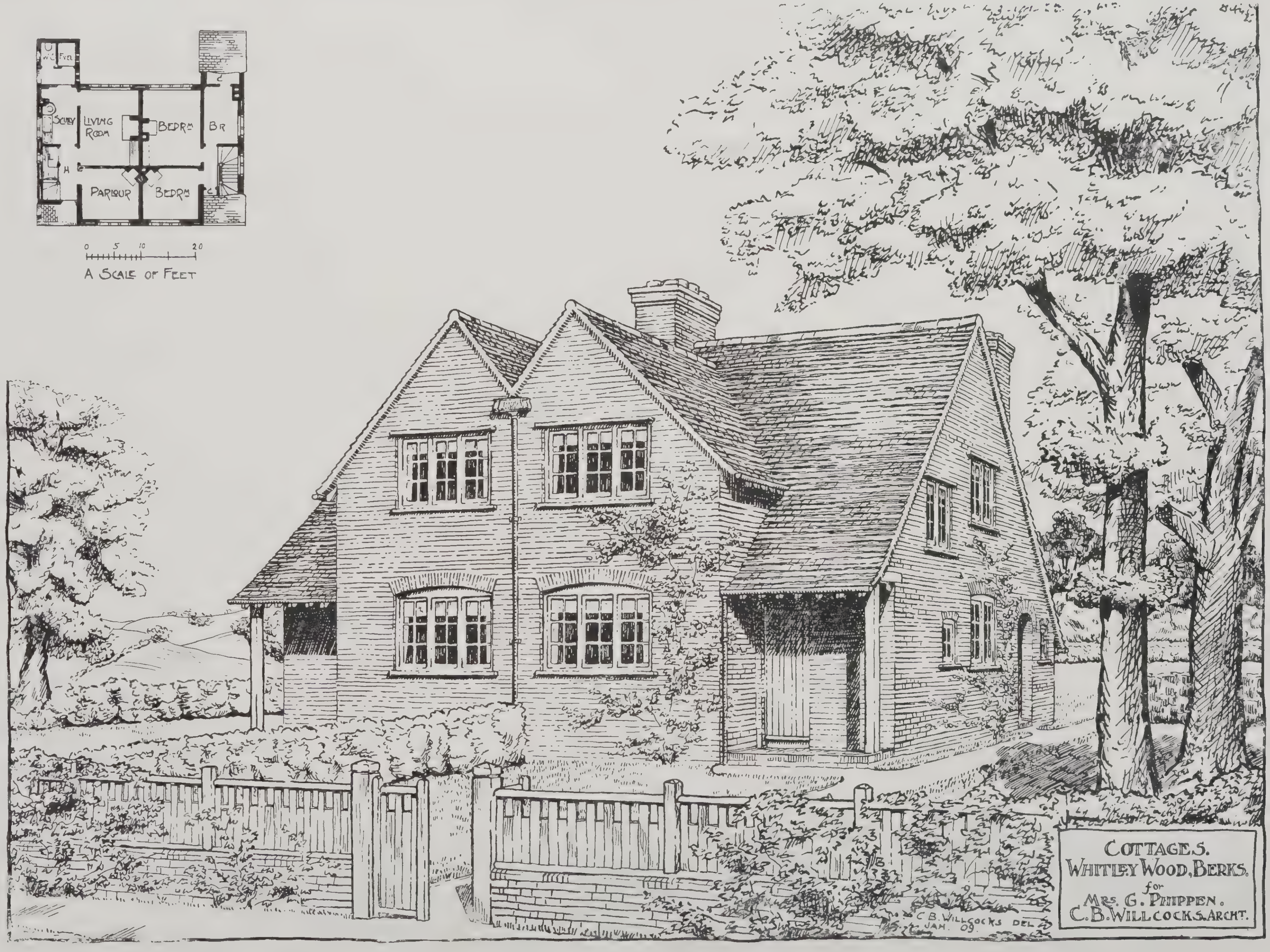
When peace and independence became established, the first thing to be considered was a form of government. When the Federal form had been adopted, General Washington was made President and Thomas Jefferson—the author of the Declaration of Independence—the first Secretary of State, one of the first things to be discussed was the proposition to establish a "Federal town, a Federal house for Congress and for the executive officers." The discussion as to where it should be located was long and heated, and strong sectional feeling became apparent. Philadelphia, New York, Baltimore, and other large towns urged their claims to be made the seat of the national Government. Maryland and Virginia offered the present territory on the Potomac on the 38 degree North latitude. Balloting gave no results; but, finally, an Act was passed conferring upon President Washington the sole power to select a Federal territory "not exceeding ten miles square on the River Potomac . . . for the permanent seat of the Government of the United States."

Thomas Jefferson.

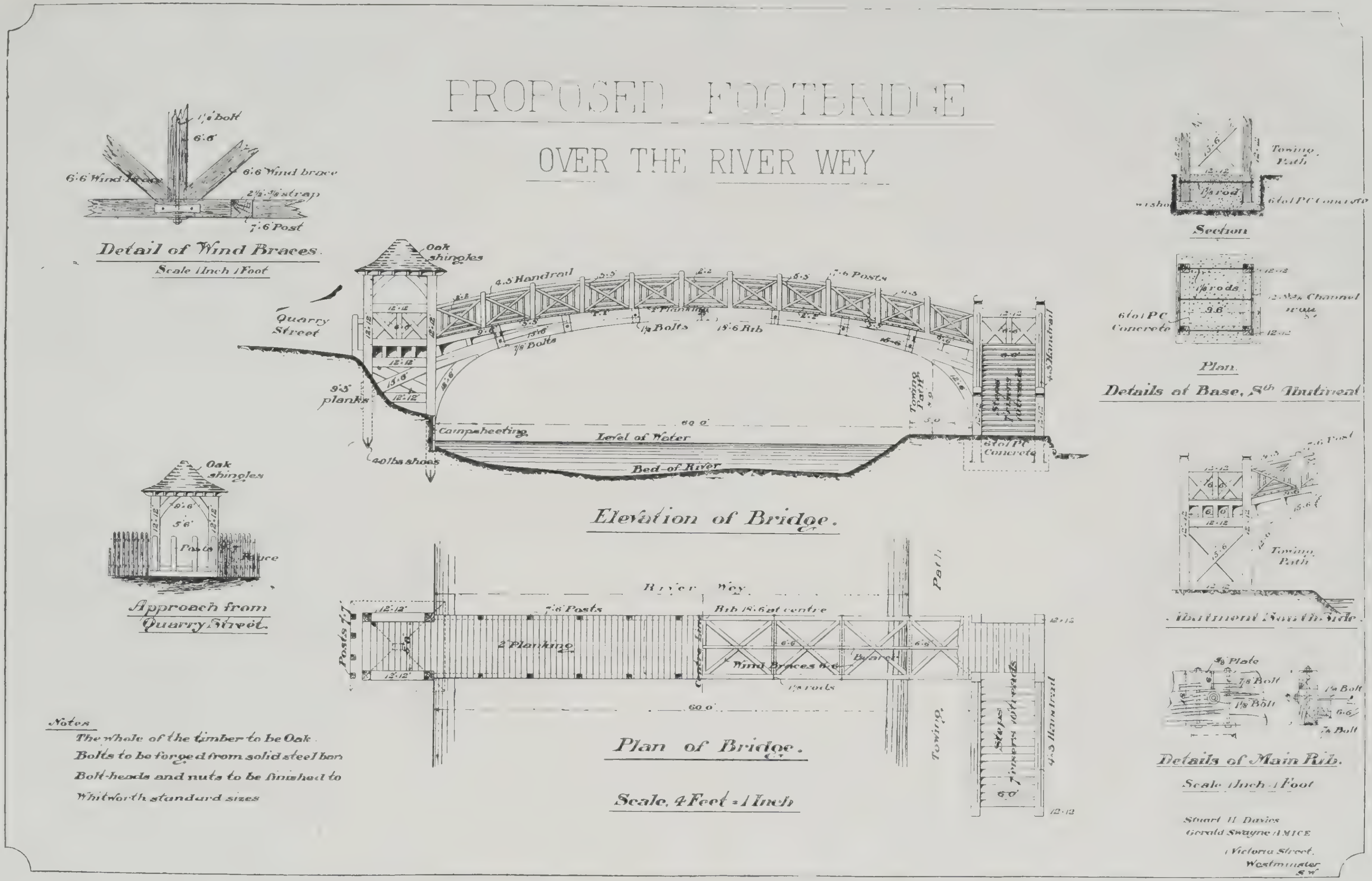
Jefferson—the author of the Declaration of Independence, the Secretary of State upon whom devolved the difficult task of arranging the diplomatic relations of the United States with the foreign nations—like many another gentleman of his day, had many callings, and seems to have been a planter, to have practised law without much pecuniary success, to have studied astronomy, gathered about him a library of great intrinsic value —in fact, the nucleus of the collection in the Congressional Library—and, what is most important to his connection with the establishing of the national capital, is the fact that he was by inclination and aptitude one of us—he was an architect—and after he retired from office at the expiration of his term as President of the United States, to which he was subsequently elected, he designed, among other things, the fine group of buildings for the University of Virginia and his own house, Monticello.

The Planning of Washington.

The Act of July, 1790, which gave the President the power to select the site for the



COTTAGES.
WHITLEY WOOD, BERKS.
for
MRS. G. PHIPPEN.
C. B. WILLCOCKS, ARCHT.



DESIGN PLACED SECOND. DAVIES AND SWAYNE, CIVIL ENGINEERS.

future seat of Government, authorised him to have it surveyed and planned, and to proceed with the construction of certain works and buildings. He therefore appointed three Commissioners to supervise the work and stand the criticism of the public—Major Ellicott to survey the territory, and Major L'Enfant to plan the city. To the last-mentioned he indicated that he thought the Federal House should be located in the centre of the town, and that the Executive mansion and offices should be kept well away from the Federal House "to prevent members of Congress from too frequently visiting the executive departments." To Jefferson he delegated everything and kept him informed of his personal wishes—possibly he had conveyed the desire "to prevent members of Congress" from interfering with the building of Washington, and that idea may have been uppermost in Jefferson's mind when in the "compromise" made with Hamilton he magnanimously proposed that Philadelphia should be the capital for the "first ten years." The versatile Secretary of State visited Europe, arranging diplomatic relations and collecting books, plans of buildings and maps of cities. The last he supplied to Major L'Enfant, and it may be—I think it probable, in view of the maps selected, namely, Paris, Orleans, Turin, Milan, Strasbourg, Carlsruhe and Frankfort, and the fact that L'Enfant was an accomplished military engineer—that it was at L'Enfant's request that the maps were obtained and he, L'Enfant, was probably familiar with them and knew something of their best features. It is probable, also that he knew of the various works of Le Notre. However this may be, he evolved from his study of them a plan for the city of Washington that was at once original, practical and beautiful; and to which the city will ultimately conform.

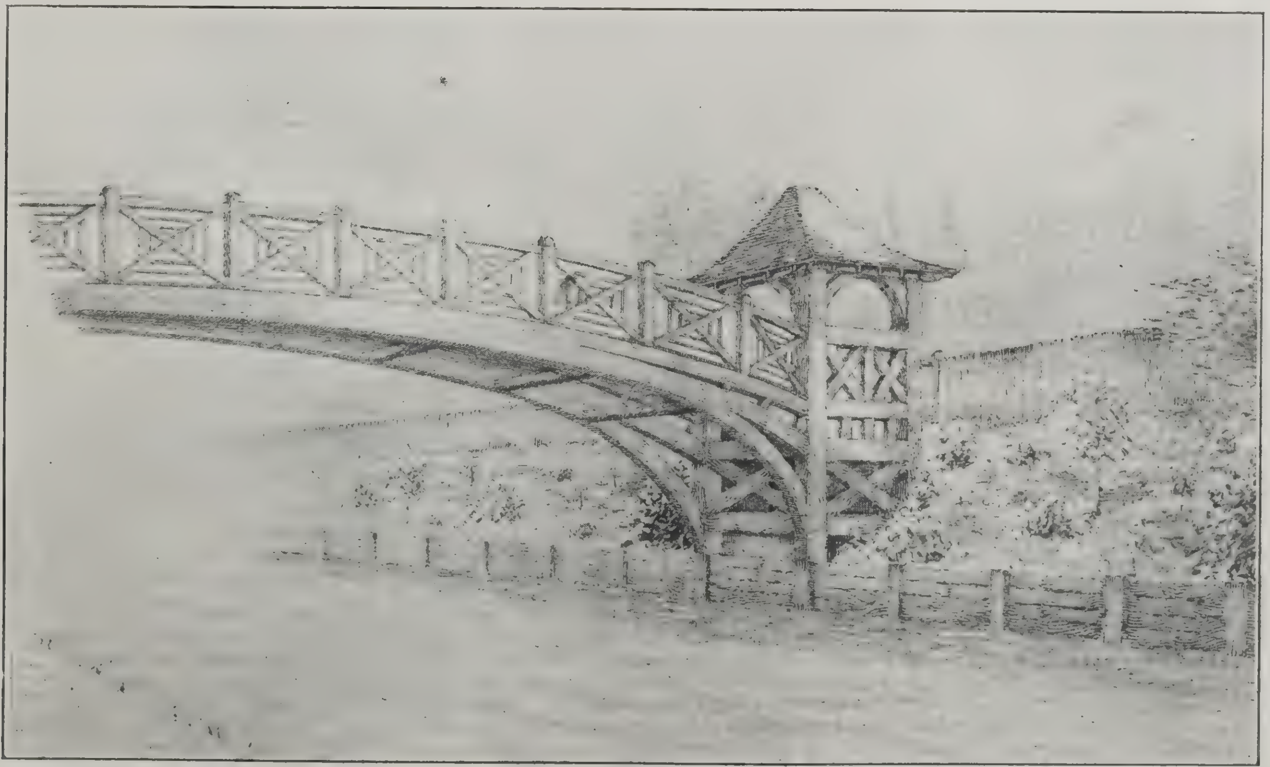
This plan provided for a central site for the "Capitol"—which was L'Enfant's designation of the Federal House—on the plateau at the intersection of two main avenues running north and south and east and west, designated as North, South, East and West Capitol Streets. The Capitol was located in a large park from which radiated twelve wide avenues, including the four known as Capitol Street, and two of each of the others (those extending in opposite directions) were named after the States of Pennsylvania, Maryland, New Jersey and Delaware. Other streets were then laid out parallel with the Capitol Streets, those extending north and south being designated by numbers, and those east and west by the letters of the alphabet. The President's house was located, facing north and south, in a park at the intersection of Pennsylvania Avenue and West Sixteenth Street. At the intersection of the principal axes of the Capitol and of the President's House it was proposed by L'Enfant to place the equestrian statue of Washington voted by the Continental Congress of 1783; and from this point to the Capitol to develop the West Capitol Street into a magnificent avenue four hundred feet wide and a mile in length, along each side of which, and situated each in the centre of its own grounds, were to be erected the "Grand Edifices." A "National Church," or kind of Pantheon for the reception of statues of heroes whom Congress might honour, was considered and mentioned in notes on early maps. The engraved map of 1792 shows sites for buildings, monuments and statuary, all arranged so as to present focal points along the principal streets, and, as L'Enfant says, "to reserve through the whole a reciprocity of sight" between the important points. Such was the plan approved by Washington and Jefferson and adopted by Congress in 1791, and which L'Enfant was entrusted to carry out.

L'Enfant's Town Planning.

L'Enfant's plans were, during his lifetime, carried out only so far as securing sites for the principal Government buildings, cutting down trees, and making a few of the principal roads. All available land was bought up by speculators, who held it at high prices, and thus retarded the growth of the town. L'Enfant refused to permit the speculators or land companies to have his plans, saying that they would spoil the city with their cheap buildings, and this attitude, coupled with his quarrel with Carroll, led to his dismissal. The personal interest which we know Washington and Jefferson took in the planning of the city and in the selection of sites for the important public buildings extended also to the selection of designs for the buildings, and, with Jefferson, even to the choice of painters and sculptors to execute monuments.

Stephen Hallet and Dr. Thornton.

The three Commissioners referred to above who were appointed to look after the laying out of the capital city were directed to "procure suitable buildings for the accommodation of Congress, and of the President, and for the public offices of the Government of the United States"; and, soon after the approval of L'Enfant's plan, they took up this important part of the work. In the year 1792 a competition was held to procure a design for the Capitol, and sixteen designs were submitted, but out of the lot none was regarded as being fit for serious consideration, and all were returned by Jefferson to their authors. Shortly afterwards a French architect, Stephen Hallet, of New York, presented a design to the Commissioners which met with general approval, and he was asked to journey to Washington to examine the site and perfect his design. About the same time Dr. Wm. Thornton, a Philadelphia physician and amateur architect, who had studied in Paris, presented an elaborate coloured design to President Washington, who was so impressed that he asked the Commissioners to adopt Thornton's design in place of Hallet's. Hallet declared that Thornton had stolen some of his rough sketches, and merely elaborated upon them. This charge Thornton vigorously denied, and the premium originally offered for a design was awarded to him. Thornton was not, however, considered to be competent to carry out the work, and Hallet was made supervising architect with a salary of £400 per year, and the work commenced after Hallet had shown that Thornton's plan was impracticable, and had revised Thornton's design. Thornton, who was what would to-day be called a political wire-puller, got himself appointed as one of the Commissioners, and a bitter quarrel ensued between the doctor and the architect. The Commissioners—no doubt at Thornton's instigation—requested Hallet to turn over all his drawings to them, which he flatly refused to do—and I think we all sympathise with his stand! He was, therefore, dismissed. George Hadfield, an Englishman, succeeded Hallet, but he, too, was badly treated by the Commission, and was forced to resign. A competition was also held for the President's House, and this was won and carried through by James Hoban, an Irishman, who had been a clerk of the works under Hallet. The President's House is a modest, though large and rather monumental, residence, belonging to the early type of the classic revival in England.



PROPOSED FOOTBRIDGE OVER THE RIVER WEY, GUILDFORD. DESIGN BY DAVIES AND SWAYNE, PLACED SECOND. (*See Centre Plate.*)

Mangin and McComb.

Leaving Washington for a moment, there is another public building which owes its American character—a character too much influenced by French design to be English, yet too English to be entirely won over to wholly French design—to the fact that, like the Capitol, it is the work of both French and English—or Irish—architects: the New York City Hall, built between the years 1803 (when Jefferson had become President) and 1812, from designs by Mangin and McComb.

Hoban and Latrobe.

To return now to the Capitol, after the dismissal of Hadfield, Hoban, the architect of the President's House, was next called in to continue the work. He completed the north wing of the Hallet-Thornton design, which is now part of the central block, in the year 1800. Three years later Benjamin Latrobe—a pupil of Cockerell—an Englishman who had cultivated the acquaintance of President Washington, was appointed to construct the south wing and re-construct the work upon the north wing which had been poorly executed under Hoban. He did both in accordance with his own plans, which did not differ materially from those of Hallet, Thornton, and Hadfield. He completed both wings in 1811, and built a kind of gantry between them.

The Capitol Destroyed and Restored.

The following year the Unites States declared war against England, and in August of 1814 the British troops took the City of Washington and burned the Capitol, the President's House and other public buildings, besides much private property. The walls of the Capitol and of the President's House withstood the flames. Latrobe, who was at the time in Pittsburg, was summoned by President Madison to return to Washington, and he proceeded with the restoration of the Capitol. To him is due the credit of designing the former House of Representatives now known as Statuary Hall—and the old Senate Chamber, used at present by the Supreme Court of the United States, and the old lobbies. He designed a low dome and the central portion of the east front, consisting of the colonnade and the pediment.

Bulfinch, of Boston.

He resigned in 1817, and was succeeded by Charles Bulfinch, of Boston, who was the first American-born architect employed on the Capitol. Bulfinch designed the hall of the old Library of Congress, which formed the projecting central feature of the West front, modified Latrobe's design for the dome, and designed the west front very much like the front of the Boston State House, of which he was also architect, and in 1827 reported that the Capitol was finished. The building completed by Bulfinch was, with the exception of the dome, what to-day constitutes the central block. It is 352ft. long by 121ft. deep, 70ft. high to the top of the balustrade, and to the top of the dome measured 145ft.

Latrobe's work was that of an architect of some—but by no means complete—training, and he introduced numerous trifling details and degenerate forms into his work on the Capitol, as, for instance, the segmental ceiling over the old House of Representatives. He, and Jefferson, who was then living in retirement and practising architecture, had much to do with the development of the so-called Classic Revival in America—the introduction of the use of Greek and Roman temples for buildings for all purposes. Presidents Madison and Monroe recognised that the earlier Presidents had spared neither time nor thought upon the study of the Capitol, and were opposed to any changes which would not be simply the logical development and extension of the original design. Latrobe and Bulfinch were both tied by restrictions in this respect. The construction of the rotunda and library indicate the growth of the wealth of the nation at that time; and the building of large groups of new colleges—the University of Virginia, Washington and Lee University, and Girard College, prove that the desire for higher education had taken hold upon the people during this period of prosperity. (There already existed several colleges and universities of note, including William and Mary, Harvard and Yale.) When Bulfinch handed in his report that the Capitol was finished he retired to Boston, and Robert Mills, designer of the old Pennsylvania State Capitol, succeeded him as a sort of resident architect or clerk of the works, but for twenty years nothing further was done to the Capitol.

The Growth of Public Buildings.

Immigration went on rapidly, the population of the country doubling and quadrupling during this time. The class of immigrants being principally farmers, mechanics, traders, and soldiers of fortune—strong, vigorous, and determined men, rather than subtle, refined, or politic. The suffrage was too easily obtained, and the votes of this horde of Europeans began to tell upon the class of men who attained the Presidency. The growth of material interests is evidenced by the building of the Treasury Department in Washington, the Customs House at Boston, the old National City Bank in New York, and similar structures at Philadelphia, Providence, Richmond, Rochester, Pittsburg, New Orleans, St. Louis, and other large towns.

"And It Was So."

In 1833 the old building of the Treasury was destroyed by fire. Mills was appointed to design a new one. It was intended to locate this department in what is now called the Mall—the park which in L'Enfant's scheme was to be traversed by West Capitol Street and made into a grand avenue—but Mills took so long deciding upon the site that President Jackson—a soldier by profession, and something of an old ruffian—lost patience with him due to his continued procrastination, and, it is said, meeting the architect just outside the President's house one morning he planted his cane at the spot where he was standing, and said "Here, right here is where I want the corner-stone laid." And it was. The building as erected breaks Pennsylvania Avenue and obstructs the view from the President's house to the Capitol and *vice versa*. The selection of this site was a serious blunder, and a frightful blot on L'Enfant's plan. The original portion was big, costly, and commonplace. To Jackson we must attribute the beginning of the appointment of army engineers to construct Government buildings. Perhaps he felt that as Washington and Jefferson had appointed engineers and architects—men of their own professions—that he should follow their precedent, by appointing others from his. On the other hand, his action was partially justified by the dearth of good architects. The commercial undertakings everywhere called loudly for the help of all the brains in the country; there were doubtless plenty of opportunities for architects who could have shown themselves competent to grapple with the problems of the times, but if a design for a church was required a Greek Ionic temple was presented, if a railway station a Greek Doric temple was considered the thing—by the so-denominated architects—and not only the President, but the railway companies and business firms placed their buildings in the hands of men who, if they knew little of engineering, had at least the advantage of knowing nothing about the works of Stuart and Revett or "Greek" Thomson.

Thomas Ustick Walter.

In 1850, when the enormous increase in population, and consequent increase in representation in Congress, made important extensions to the Capitol necessary, Thomas U. Walter, of Philadelphia, was practically the only architect left who could be entrusted with this great task. Walter was a classicist, but used the orders with intelligence, refinement, and effect. He was also an able, practical planner, and withal an artist competent to compose both as to plan and perspective. Between the year 1850 and towards the end of the Civil War he planned and carried out the extensions and dome of the Capitol as it exists at present. He treated the scheme boldly and simply, leaving the plan of the centre block as he found it, and adding two great wings, making a three-part composition. The longer axis of the old building runs north and south; the axis of Walter's two wings were made to run east and west, and the resulting masses in pleasing contrast to that of the old central structure. Walter began his design and carried it through to completion during the saddest period of American history—at the time when bitter controversy had arisen between the States of the North and South over the question of the extension of the slave-holding territory.

To be concluded.)

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Green Distemper.

PLUMSTEAD.—SENEX writes: "The interior of a public building has recently been distempered pale green. The plastering is good and has been twice previously distempered. The walls were washed, but the old pink distemper was not completely removed. After a coat of clearcole, slightly tinted, a finishing coat of distemper, said to be stained with Brunswick green, was applied. The work has dried very unevenly, in shades of varying depth, and does not look solid. The contractor attributes want of uniformity to the frosty weather which prevailed while the work was being done. Would severe frost account for the unsatisfactory result, and what remedy would you suggest? It might be added that the ceilings have been distempered pale cream colour, and possibly some of the surplus stuff has been mixed in with distemper for walls."

Frost would very likely account for the defect, although possibly the distemper was not properly mixed. The only thing to be done is to wash it off and give it another coat, preferably of washable water paint, which would come cheaper in the end.

J.

Civil Service and L.C.C. Appointments.

LONDON, S.W.—L.M.P. writes: "To whom should application be made for a place as assistant at the Admiralty, War Office, or L.C.C.?"

Inquiries in regard to architectural assistants at the Admiralty should be addressed to the Secretary, Department of the Director of Engineering and Architectural Works, at 21, Northumberland Avenue, W.C. We do not know of any openings for such in the War Office Departments, but inquiries might be made in regard to the matter from the Department of the Civil Member of the Army Council and the Building Works Department of the Ordnance Committee. With regard to the London County Council, there are several departments in which architectural and survey assistants are employed, but in the first instance it is best to apply to the Superintending Architect, County Hall, Spring Gardens, S.W. Your correspondent might profitably refer to "The Civil Manual," published by the Civil Service Press, Chancery Lane, W.C. B.

Rights of Light Question.

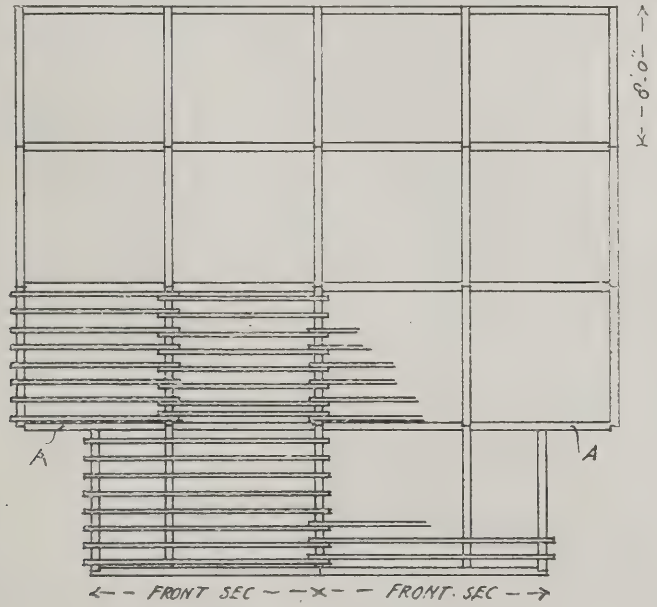
YORKS.—J. E. H. writes:—"The owner of a house has recently pulled down a covered portico (plan enclosed, but not reproduced), carried on columns, leaving the columns standing on the wall 3 by 6 high. Between these columns he has erected a glass screen, filled with obscured glass. This appears to have been erected to prevent people entering the church from looking into the house entrance. The portico was a heavy one, with concrete or lead roof, and evidently made the entrance hall to the house rather dark. By removing same, the owner secures top lights to his hall. This portico was open on all three sides, and unglazed. The trustees of the church are afraid that this screen will secure to the owner of the house a right of light which might at some time prevent a porch from being built. Both properties have been built more than twenty years. (1) Does this glass screen constitute a 'light' (the top of porch is now quite uncovered, and screen stands alone between two columns)? (2) Have the trustees any right to block this screen on the assumption that (1) is answered in the affirmative? (3) Would any purpose be served by blocking it? (4) Would not the fact that the porch had open end where screen now is give it the right whether glazed or not?"

(1) I do not think that the screen *per se* would constitute a light that might become ancient, but you must, of course, face the fact that everything was previously open, and that, if anything, the screen forms a curtailment, and not an enlargement, of whatever right of light may have previously existed. (2) The trustees have precisely the same right as they had before the erection of the screen—neither more nor less—and if the entrance hall has a window which has been in existence 19 years and a day, they must regard it as an "ancient light," and so leave it alone. (3) I doubt the expediency, but I cannot see that it would do any harm. (4) Not the portico, but the light to the entrance hall behind it, would form the ancient light (if any). F.S.I.

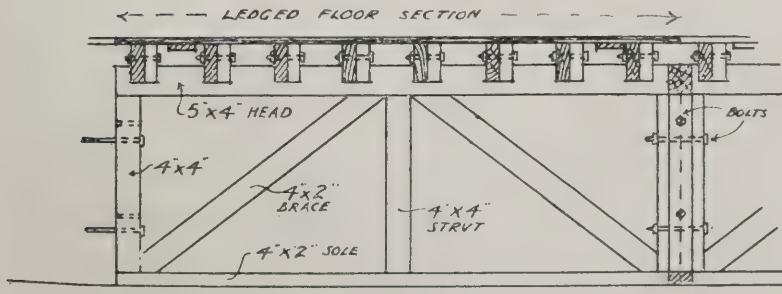
Platform for Drilling and Gymnastics.

LIVERPOOL.—NATAS writes: "Could you furnish me with a sketch of the construction of a removable platform to be used at the annual display of a Boys' Brigade (drilling and gymnastics), to be in sections and easily handled, which would meet with the requirements of the building surveyor? Size of platform, 32 ft. by 32 ft. by 3 ft. 6 in. high, with two flights of steps at each side."

The purpose of this platform renders necessary a considerable degree of strength and rigidity, which makes it difficult to secure lightness and easy handling. In the accompanying sketches, interchangeability of parts has been aimed at, to ensure ready re-erection by unskilled labour with the minimum risk of error. The 36 framed bearers are all similar, although 16 of them may serve for stiffeners only, without carrying any proportion of the weight. The system should be easily grasped from the small-scale plan—briefly, the bearers running from front to back are butted end to end, and bolted together with two three-quarter inch screw bolts. They are braced apart by similar bearers bolted through *between* the ends of the first-named series (grooves should be cut to allow the bolts to pass). The bolt holes (in pairs for alternative purposes) should not be the same distance up at bottom as they are down at top, in case one or more sections might be inadvertently reversed in fixing. The sections "A" should be specially marked, and have bolt-holes in centre strut, for bearers, and also staples for attachment of stairs. The front screen is in two sections, and the steps with their landings may be separately framed. 7 in. by 2½ joists are notched out 3 in. over bearers and lapping at ends, where they should be bolted together after fixing with ½ in. bolts. The flooring may be ledged together in sections about 8 ft. by 4 ft.



GENERAL SKETCH.



DETAIL SKETCH.

ILLUSTRATING REPLY TO LIVERPOOL.—"NATAS."

Strength of Floor.

LONDON, S.W.—STUDENT writes: "For general practice, what dead weight per foot superficial should be allowed in constructing dwelling-house floors?"

The common rule for scantling for fir joists is: "Depth in inches equal half span in feet plus 2, thickness equal one-third depth." Applied to the given span of 14 ft., this rule would indicate

$\frac{14}{2}+2=9$ ins. deep, and $\frac{9}{3}=3$ in.

thick, and a careful architect might be relied upon to use regular 3-in. by 9-in. deals for this purpose. The allowance for external load upon a dwelling-house floor varies from ¾ cwt. to 1 cwt. per foot super, but it is generally allowed that upon a wooden floor in a private house a total of 1 cwt. per foot super for live and dead load together is sufficient. The writer's practice in estimating the safe load on a fir beam or joist is to allow a factor of safety of 7, this converts the ordinary formula of $W=\frac{cbd^2}{L}$ where W = breaking weight in centre in cwt. and c = constant 3.5 into $W=\frac{bd^2}{L}$, where W = safe load in cwts. distributed, which is, after all, what is usually wanted. By this formula the safe load on a 2 in. by 8 in. joist 14 ft. span would be $W=\frac{bd^2}{L}=\frac{2\times 8^2}{14}=9\frac{1}{7}$ cwts., and safe load per foot super when placed 12 in. apart

$$=\frac{9\frac{1}{7}\text{ cwts.}}{\frac{14\text{ ft. span}\times 14\text{ in. centres}}{12\text{ in. in 1 ft.}}}=56\text{ cwt.}$$

or about half of what should have been provided for. HENRY ADAMS.

Continuous Louvres and Gear for Working Them.

BREDBURY.—A. C. writes: "Please give names and addresses of makers of louvre ventilators, and opening and closing appliances."

Almost any maker of builders' ironmongery could supply the necessary fittings, say Gardiner, Son and Co., Ltd., Nelson Street, Bristol; James Gibbons, St. John's Works, Wolverhampton; C. Kite and Co., 132, Euston Road, London, N.W.; Pryke and Palmer, Upper Thames Street, London, E.C., unless some special make is wanted. The louvres of a continuous series are always pointing downwards to the outside to discharge rain and moisture away from the interior. A small gutter is often added inside. HENRY ADAMS.

Old Book on Carpentry.

LONDON, N.W.—W. B. writes: "I have a copy of the third edition of 'The Elementary Principles of Carpentry,' by Thomas Tredgold, published in 1840. Is it of any value?"

The work by Tredgold on Carpentry has practically no value. B. T. B.

Removing Stains from Pavement: Cleansing Closet Trap.

IPSWICH.—H. M. C. writes: "Can you inform me (1) what will remove oil stains from an old pavement floor, and (2) what will clean the trap of a pedestal closet that has been much neglected?"

(1) Wash the pavement with hot turpentine. If this still leaves a mark apply powdered fuller's earth, and put upon it a hot flat iron. Do this several times, if necessary. The heat will liquify the grease when the fuller's earth will absorb it. (2) Try strong hydro-chloric acid, applied with a piece of rag tied on the end of a stick.

J.

Sewage Powers.

SEATON.—SEWER writes: "I am the owner of a field through which the local council are taking a new sewer, without making any arrangements with me. Their surveyor informs me that they (the council) are fully empowered to do so. Is this correct, and if so, by what Act is the power obtained? The matter was not mentioned to me in any way."

The local sanitary authority possess compulsory powers by virtue of which they can lay a sewer through private property in this way; but they must pay for any damage or loss caused by their action, including consequential damage, such as the decreased value of the land for building purposes (if any) caused by the presence of the sewer, and possibly manholes, on your property. I advise you to draw the attention of the sanitary authority rather sharply to their high-handed action, and to place the matter in the hands of your solicitor, or of a compensation surveyor, for settlement. You may take a lump sum or an annual rental.

F. S. I.

Ascertaining Price of Timber Scantlings.

Herne Hill, S.E.—R. S. writes: "Are there published any sets of tables showing how to ascertain the price of timber in scantlings?"

A book that will probably answer your purpose is "The Timber Merchant and Builder's Vade Mecum," by George Bousfield, published by E. and F. N. Spon, although it does not appear in their latest catalogue.

Henry Adams.

Point in Practical Acoustics.

Sunderland.—T. K. writes: "Please state whether in your opinion the transverse plaster arches shown in the enclosed sketch of a church (not reproduced) would interfere to any extent with the audibility of the preacher's voice?"

So little is known of the science of practical acoustics, that it is difficult to forecast the result in any particular case. Looking at the proposed sketch, it would seem probable that the voice would be somewhat checked in reaching the full distance, but echoes and reverberation would not occur. See Prof. Roger Smith's "Acoustics in Relation to Architecture and Building" (Lockwood, 1s. 6d.).

Henry Adams.

Current Domestic Work.

Cheshire—("Teak").—(1) What name would you give to the domestic architecture so much in vogue now, in which buildings are, say, stock brick for the height of the ground storey and roughcast above, tiled roofs? (2) Are there any canons to be studied in designing buildings constructed as above? For instance, may the roughcast be commenced at the line of the heads of the ground-floor windows, or half-way between these heads and the bedroom window-sills with equal correctness? (3) Chimneys springing from the roof, not connected by the walls, as they would be if at an outside wall, may, I suppose, be of stock brick instead of covered with roughcast, if desired? (4) Is there any special pitch for the roofs? (5) Any information about this class of work will be greatly esteemed.

(1) No special names are properly applicable to any current methods of architectural design. Names are attached by historians to distinguish past styles—it is only the imitations of these styles in modern times which can be indicated with tolerable accuracy by terms other than descriptive. (2) The principles to be adhered to depend upon the purpose which the roughcasting is intended to serve, though the main object should always be to secure good proportion between the spaces. For instance, if the roughcasting is a protective addition to thin walls, it would obviously be foolish not to cover the whole of a storey; but if by so doing an unpleasant proportion is obtained, the coating may be extended below this to the heads of the windows under. If the object is, however, solely æsthetic, such as the correction of an unduly high proportion by the introduction of markedly horizontal bands, the roughcast may start at any level which best achieves the effect desired. (3) Chimneys may certainly be in brick. (4) The pitch of roofs will depend entirely on circumstances: 50 deg. is a usual angle for gabled roofs, and is better than square pitch. (5) As a general hint, it may be said that roughcast walls rarely look well unless it is possible to set the window frames flush with or in advance of the outer face (*i.e.*, without reveals). Also the surface of the roughcast should not be too rough, and is best tinted white or cream; the gravel-beach affair beloved of the speculative builder is deserving only of execration.

G.

Employment on the Ordnance Survey.

Neath.—S. K. T. writes: "Please state methods of procedure in order to obtain posts on the Ordnance Survey."

Assistants on the Ordnance Survey are mainly taken from three classes, viz.: (a) Boys whose parents or relatives live at or near the Headquarter or Division offices. These boys join young at low rates of pay, and are gradually trained to Ordnance Survey duties. (b) Young men who join an office for training as draughtsmen, etc., or a field section for training in field work. The rate of pay on joining is not usually more than 15s. to 18s. a week. These cases are infrequent. (c) Labourers, who join at the rate of 16s. 6d. a week, getting 18s. a week after one year's service, if not less than twenty years old. Applications for employment should be addressed to the Director-General at Southampton, or to one of the local division offices at Carlisle; Clifton, Bristol; Edinburgh; Redhill; Redlands, Bristol; and York. Applications for employment in the field should always be addressed to one of the local division officers. There is no prospect at the present time of any additions being made to the Civil force. The military staff—both commissioned and others—are Royal Engineers.

Stability of Reservoir Wall.

Pontypridd.—G. L. M. writes: "Please advise as to the stability of the wall shown in the accompanying section."

It appears that the design submitted, as shown in sketch herewith, will be just strong enough. The method of working will be as follows: From A set off A B, making the angle between it and the back of wall equal to the natural slope. Produce the slope of surcharge to meet A B produced in C, and construct a semi-circle on A C. From the junction of back of wall and surcharge drop a perpendicular on to A C and produce it to cut the semi-circle in D, then with centre C and radius C D describe an arc cutting A C in B. Then the horizontal thrust from the earth will be $\frac{1}{2}w\,(AB^2)=\frac{1}{2}\times 94\times 6^2=15.1$ cwt. acting at one-third of the height of wall. The equivalent thrust parallel with the slope of surcharge is found as shown, and combined with the weight of wall giving a resultant which cuts the ground line at 1.3 ft. from centre of base. The stresses thus produced when the reservoir is empty will be

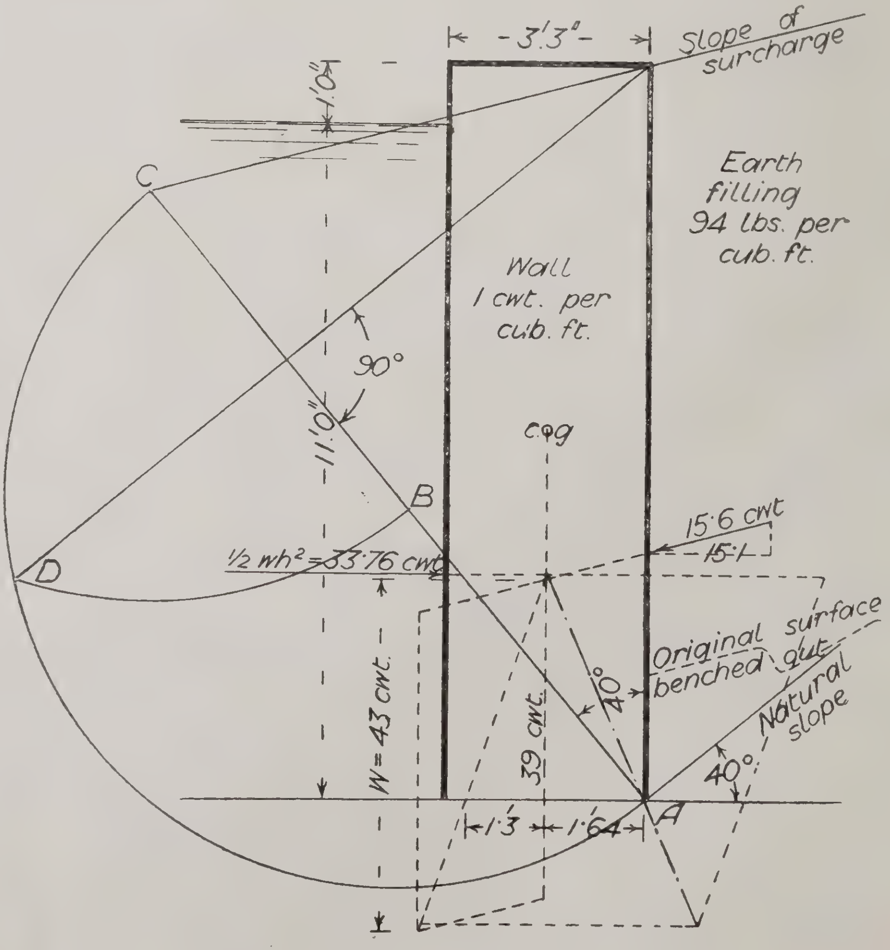
$$\frac{W}{A}\pm\frac{M}{Z}=\frac{43}{3.25}\pm\frac{43\times 1.3}{\frac{1}{6}(1\times 3.25^2)}=13.23\pm 31{\cdot}2$$
$$=44.43 \text{ cwt.}$$

or 2.22 tons per square foot compression at water edge, and 17.97 cwt., or 0.9 tons per square foot tension at earth edge. This resultant is next combined with the thrust from water giving the final resultant which cuts the base line at 1.64 ft. from centre of base. The stresses produced when the reservoir is full will be

$$\frac{W}{A}\pm\frac{M}{Z}=\frac{43}{3.25}\pm\frac{43\times 1.64}{\frac{1}{6}(1\times 3{\cdot}25^2)}=13.23\pm 40$$
$$=53.23 \text{ cwt.}$$

or 2.66 tons per square foot compression at earth edge, and 26.77 cwt., or 1.34 tons per square foot tension at water edge.

Henry Adams.



ILLUSTRATING REPLY TO PONTYPRIDD.—"G.L.M."

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
April 10.	BOLTON BRANCH PUBLIC LIBRARIES. The Libraries Committee of the Corporation invite competitive plans from architects who have been principals in the County Borough of Bolton six months prior to the present date, for Branch Public Libraries to be erected in the districts of Astley Bridge, Halliwell, and Gt. Lever. The plans and particulars may be obtained from Samuel Parker, Town Clerk, Town Hall, Bolton. Deposit, two guineas.
April 12.	ELLAND NEW SECONDARY SCHOOL. Architects having offices and practising in the West Riding of Yorkshire are invited to compete for the work in connection with the new Secondary School at Elland, and should apply for particulars to Mr. Leonard Clegg, Holiwell Green, near Halifax.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading. Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second, and third respectively. Assessor: Mervyn E. Macartney, F.R.I.B.A., F.S.A.
July 31.	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	BOURNEMOUTH BRANCH PUBLIC LIBRARY. Architects practising in the County Borough of Bournemouth are invited to submit designs for a new Branch Library at Boscombe. Particulars from Charles Riddle, Borough Librarian, Central Library, Bournemouth.
No date.	WALLASEY U. D. COUNCIL CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

Holgate Grammar School, Barnsley.

This competition was assessed by Mr. A. W. S. Cross, M.A., F.R.I.B.A., in conjunction with Mr. A. V. Houghton, the West Riding County Council's Chief Inspector for Higher Education, some weeks ago. It has now been announced that the design of Messrs. Crouch, Butler, and Savage, of Birmingham, has been adopted. The designs selected by the assessors were as follows:—First, No. 42, second, No. 44; and third, No. 11. On enquiry of the Clerk to the Governors, we are informed that the design of Messrs. Crouch, Butler, and Savage is first, but the names of the other architects cannot be disclosed at present.

Pontardawe Guardians' Office.

The design submitted by Mr. A. U. Leon, of 20, Working Street, Cardiff, has been selected in the above competition.

Berkshire County Offices, Reading.

An enquiry having been addressed to us on the point, we take this opportunity of saying that this competition is an open one.

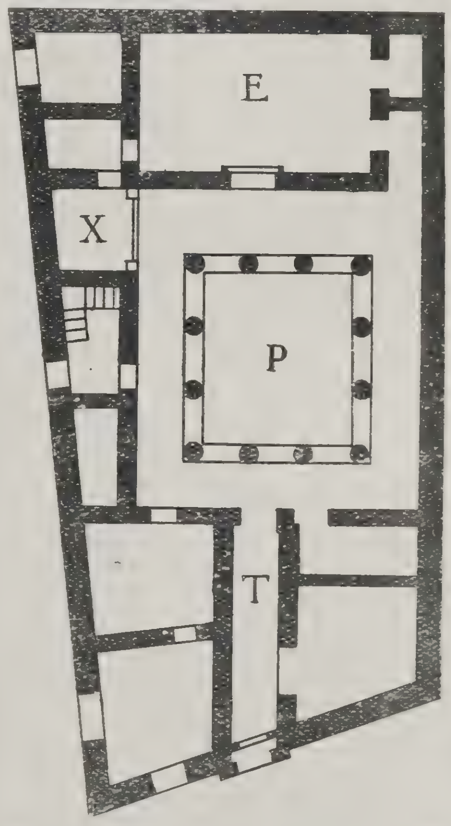
Bethel Independent Chapel, Penclawdd.

The design of Mr. W. Beddoe Rees, of 3, Dumfries Place, Cardiff, has been selected in the above competition.

Societies' Reports.

University of Liverpool Architectural Society.

At the third ordinary meeting of the Architectural Society of the University of Liverpool, Professor Myers delivered a lecture on "The Homeric House." In the main, the lecture was a subversion of the theories concerning the plan of the Homeric House generally accepted down to the time of Schliemann's excavation of Tiryns. These theories, restated by the late Sir Richard Jebb on the morrow of Schliemann's discoveries, and since generally accepted by British scholarship, regardless of Continental criticism and the inevitable deductions from subsequent evidence, Professor Myers demonstrated, were largely based on an ignorance of the exact significance of certain Homeric phrases, and on a misinterpretation of Vitruvius's statements (vi., 5.) as to the relation of the men's quarters in an Hellenic house to those of the women. The main problem involved in the controversy, which has passed through so many phases, is as to the position of the Thalamoi (bed-chambers) with regard to the megaron (main hall). Both the literary and archæological evidence refuted the traditional view, in which Jebb persisted, that the women's quarters were entered through a door on a raised dais at the inner end of the megaron; actually the women were not restricted to any particular portion of the house, and there is no evidence in Homer for the supposition of the existence of either a dais or a second door—the phrases "ashen threshold" and "stone threshold" referring not to two distinct doors, one at either end of the megaron, but simply to one door, the main entrance, which was provided with a wooden sill, to receive the door pivot, placed across the stone floor-slab. In conclusion, Prof. Myers dealt with the latest stages in the controversy, showing that the Homeric house more closely corresponded with the Mycenæan than with the Hellenic (Delian) house. Though no evidence has yet been discovered as to the character of the early Hellenic house, more copious data concerning the Homeric house have been obtained from Knossos and other sites, enforcing a distinction between the mainland and the insular type, and proving that, whereas both the Mycenæan and Knossian dwellings are of Minoan origin, the Achæan house has probably a central European source, and may be compared in its general arrangement with the "House of Priam" in the Iliad, which can be interpreted as still more closely resembling the Central European prototype, with large inner court and numerous specialised chambers, all opening equally on to it.



GROUND PLAN OF THE HELLENIC HOUSE (DELOS) ACCORDING TO VITRUVIUS (AS REVISED).

E. Exedra or Lounge.
X. Pastos—a recess probably representing the last traces of the Homeric and Mycenæan Megaron.
P. Peristylion—regarded by Vitruvius (revised) as the women's quarters.
T. Entrance passage to Peristylion between outhouses utilised as stables, shops and stores.

Liverpool Architectural Society.

At the fourth members' meeting of the Liverpool Architectural Society, held on Monday, March 15th, in the society's rooms, 13, Harrington Street, Mr. Ramsey Traquair, A.R.I.B.A., read a paper on "Mediæval Architecture in Greece." Mr. Traquair briefly traced the early history of mediæval Greece from the time of the fourth crusade (1202) to the Turkish conquest in 1460, during which period Greece was under Frankish or European influence, and formed part of the Latin Empire of the East. Though, in the architecture of that epoch, Western influence is apparent, the actual effect of the Crusades on the arts is curiously small. Practically in Elis alone, the first and last stronghold of the Frankish power, are there any buildings of definitely Gothic character, having buttresses, pointed rib vaults, and traceried windows; and even in these the masonry is built in the typical Byzantine manner of alternating brick and stone courses. For the rest, elsewhere, a few occasional points of detail are the only evidence to distinguish the work as of Western origin. The mediæval castle at Geraki is, however, an exception, the treatment of its walls displaying the full development of the Gothic rampart. The lecturer then passed on to a consideration of the evolution of the Byzantine church plan, from the simple cell form, usually very small, terminating in a semi-circular apse and with a small narthex often attached, to the more complex type consisting of two intersecting cells. The former, common in early Christian times in Italy and the East, and in Romanesque architecture in Europe, is not a usual Byzantine arrangement, except in Greece, where it is vaulted by a simple brick barrel vault. The latter more elaborate type is well illustrated by the Church of Hagia Paraskevé at Platza, on the western coast, which, with its transverse and longitudinal vaults and richly patterned brickwork, is admirably characteristic of the later Byzantine school. An example from Vilyto furnishes a further development of the church plan, the long barrel-vaulted cell being divided into three bays by transverse arches, and the centre bay covered by a high drum dome on pendentives. Contrary to the usual practice, this drum is unpierced, and the brilliancy of the Greek sun is such that the interior of the church is quite adequately lighted by a small side door and two windows, each some 6 inches wide by 3 feet in height—a fact which has an important bearing on the much-discussed problem of temple lighting. The next important step in planning was the substitution of columns for the four inner angles of the cross plan—a practice universal in all Byzantine lands from the tenth century onwards. In Greece the place of the western columns is frequently taken by square piers, and a strong tendency is evident to lengthen the western arm. The long basilica-like plan evolved in the fourteenth century, under Italian influence, was the inevitable outcome of this tendency, and is essentially different from the true Byzantine type, being concentrated to the eastern end and not to a central dome. Mr. Traquair illustrated the treatment of the central dome internally and externally by many excellent slides, showing examples of the low conical roof and flat cornice type, and others in which the more distinctly Byzantine form is employed, the arches of the external octagon breaking up into the roof. Internally, the solution of the problem of covering a large floor space by the dome was arrived at through the introduction of octagonal squinches, which may be regarded as cutting off the lower parts of the pendentives, that would otherwise be impossibly large and deep in the ordinary square plan. The lecture concluded with an examination of the Venetian influence, in the sixteenth century, on the military architecture of that time in Greece. At the request of the chairman, Mr. P. C. Thicknesse, F.R.I.B.A., a vote of thanks was proposed by Mr. Edmund Kirby, and seconded by Professor Reilly. The latter, whilst expressing his appreciation of the value of Mr. Traquair's research work in Greece, deplored that archæological tendency in architecture which tended to revert to the immature forms of this early Byzantine work, regardless of its remoteness from the requirements of our own civilisation.

Gloucester Architectural Association.

At a meeting of this association, the president (Mr. H. W. Chatters) in the chair, Mr. F. W. Waller read a paper entitled "A Holiday in Egypt." Commencing with Cairo, the lecturer described the principal temples on the banks of the Nile as far as Philæ, illustrating them with very fine lantern slides, both of the buildings themselves and their details, those of Luxor, Thebes, Karnac, and Philæ being especially beautiful. In addition, Mr. Waller gave much historical information on Egyptian architecture, and contrasted by means of specially prepared lantern views the Great Pyramid with Gloucester Cathedral and its precincts, and the Great Hall of Karnac (the largest temple in the world) with the nave of the cathedral, the latter appearing very diminutive beside the former. A short discussion followed the paper, after which, on the proposition of the president, seconded by Mr. Englefield, and supported by Mr. H. Medland, a unanimous vote of thanks was accorded to Mr. Waller for his paper.

Institute of Builders.

The twenty-fifth annual general meeting of the Institute of Builders was held at 31 and 32, Bedford Street, Strand, W.C., on Thursday, March 25th. The annual report was submitted, and the audited accounts and balance-sheet for 1908 were adopted. The following is a list of the elections:—President, Mr. W. F. Wallis, J.P. (Maidstone); vice-president, Mr. R. W. Neill, J.P. (Birmingham); treasurer, Mr. W. Shepherd (London); hon. auditor, Mr. F. N. Cowlin (Bristol); executive council, Mr. E. J. Strange (Tunbridge Wells,) Mr. Ernest J. Brown (London), Mr. G. Bird Godson (London), and Mr. W. Lawrence, jun. (Waltham Cross). A hearty vote of thanks was passed to Mr. J. Carmichael, J.P., for his able occupancy of the presidency during the past year.

Birmingham Clerks of Works and Building Foremen's Association.

The fifth lecture of the session of this association was given at the Midland Institute by Mr. H. C. Stilgoe, M.I.C.E., the City Engineer and Surveyor of Birmingham. The subject was "Road Construction," and the lecturer traced the construction of roads from the early work of the Romans to that of Telford and Macadam, pointing out by means of samples and diagrams the materials used at various times, and the methods of working. He then treated of paved roads, and explained the advantages and disadvantages of such paving materials as hard and soft woods, granite setts, asphalte, etc., and concluded by referring to the experiments which have been made to lessen the dustiness of roads and to cope with the rapidly increasing motor traffic. Mr. Stilgoe gave it as his opinion that, taking into consideration the cost, tar-spraying on well-made macadamised roads was the best method, but that even this, cheap as it is compared with other methods, was far too costly for rural authorities to undertake if they had to depend for funds upon local rates. Consequently he felt sure that very soon the Government would be obliged to take over the maintenance of country main roads as a national matter. At the conclusion of the lecture, a hearty vote of thanks was accorded to the lecturer.

DECORATIVE PLASTERWORK.

In his lecture on "Plaster-work," delivered at the Carpenters' Hall, London Wall, E.C., Mr. Laurence A. Turner traced its historic growth in design and treatment. The terms used in describing the various kinds of plaster-work were dealt with. Stucco-duro is carbonate of lime mixed with sand. This is the material used by the Italians, and was modelled in situ. The quicklime is mixed with water, and is kept in a moist state for months, and in some cases years, when it can be modelled like clay. Pargetry is made of lime mixed with sand and hair. Plaster of Paris is sulphate of lime, and sets hard in a few minutes when mixed with water. Fibrous plaster is a plaster of Paris strengthened by wood laths and canvas.

The earliest form of plastering in England was that of the dauber—that is, wooden structures covered with wattles, between which was squeezed the clay, and this was smeared over the face. Later, clay and sticks were used in filling in between framings, and an example was shown in which ash and hazel sticks had been used. The hazel had quite decayed, but the ash remained. The man who did this claywork was called a "dauber," and men are to be found to-day who call themselves daubers. After briefly referring to some remains of plaster-work in Saxon and Norman churches, the lecturer said that the next great advance was to mix hair with the lime and sand. This was called "Parge" or "Pargetry." The lime sometimes had chopped hay mixed with it instead of hair, and pebbles for rough-cast, as we have it to-day. It was not until we come to the time of the ambitious Cardinal Wolsey that the art of the plasterer came into prominence, mainly through the introduction of Italian workers, as may be seen in the ceiling of Wolsey's Closet, Hampton Court. In Henry VIII.'s reign the ceiling panels were smaller than those which followed, the tendency being for them to increase in size as time went on. The Italians worked in stucco-duro, and as their work here was exotic, it is scarcely fair to criticise it.

We Englishmen, the lecturer continued, do not realise that our plaster-work is second to no other country in the history of the world, with the exception of Italy. It is the domestic plaster decoration work of which we should be so justly proud, and which is so often ruthlessly thrown into the rubbish cart, to make way for a modern piece of engineering. Though the imported Italian workmen gave a stimulus to the craft, it was a still further development of a native tradition; and although the English plasterers made full use of their examples, yet they produced something entirely fresh and new. Mr. Turner here referred to the wonderful plaster building of Henry VIII.'s reign, known as the Palace of Nonsuch, and quoted passages referring to it from Mr. Bankart's book on the art of the plasterer, and Mr. Millar's on plastering, and two slides were shown of the palace. During the reign of Elizabeth, he continued, there was great activity in building, and such houses as Haddon, Crewe, Chatsworth, and many others, all of which are existing, show how the art of plaster-work advanced in her reign. Some slides were shown of Hardwick, in which the plaster is in good condition, although exposed to the air ever since its execution. Slides were shown of ceilings in the drawing-room and ball-room at Haddon, 1545; Nelson's room at the Star and Garter Hotel, Yarmouth; Windsor Castle, 1599; the long gallery at Powis Castle, 1592; and another room at Powis dated 1593, and the main points of interest were pointed out by the lecturer. An interesting example of parge work, supposed to have been executed at this time, from a house at Wivenhoe, Suffolk, was shown.

During the reigns of James I. and Charles I., the work of the plasterer continued to flourish, and much important plaster decoration was done at about this time at Knowle, Audley End, and Broughton, and many other houses throughout the country. The long gallery at Knowle, dated 1605, was shown, and the lecturer remarked that it was one of the best known ceilings in the country. Other examples were shown, including some from Bishop King's house at Oxford; Merton College Library, Oxford; Audley End, 1615; the Reindeer Inn, Banbury; and Aston Hall, 1635.

About this time a new development takes place in the treatment and details of ceilings. Inigo Jones introduced a new treatment, more architectural and on a larger scale. He broadened out the ceiling rib, and made the large coved cornice a feature and a large recessed panel in the centre. Examples were shown from Coleshill, Berkshire; Ashburnham House, and Wilton House. The next figure that stands out as clearly defined in his period as Michael Angelo did in his, is Sir Christopher Wren. The fire of London, which gave him such opportunities, also marks a further development in the design of plaster ceilings. The ceiling from the New River Co.'s board room was shown as an example of his work. The lecturer here showed some more examples of parge work from Prittlewell, and Sparrow's house at Ipswich. Wren's work was followed by Sir John Vanbrugh, who built Blenheim and Castle Howard. Then came James Gibbs, who built the Senate House, Cambridge, 1772; and the Radcliffe Library, Oxford, at which point, the lecturer remarked, the work was getting more and more rococo.

The next period is that in which the brothers Robert and James Adam were most productive, namely, between 1760 and 1790. They placed a restraining hand upon the modeller, and kept his relief very low. These architects were followed by George Richardson, who followed on the same lines, and the art of plaster-work was dead and buried. With regard to present-day work, Mr. Turner said he was very certain that the art of the plasterer is only to be learnt through the system of apprenticeship. Without experience gained on work carried out for actual use, no one will ever be worth his salt, however many diplomas and medals he may have won. There is a great deal for the man to learn who works in lime plaster. He should be taught to model, and the modeller to plaster. In conclusion, the lecturer expressed a hope and a belief that we have a young and healthy decorative plasterer growing up among us. Let us do our best, he said, to bring him up in the way he should go.

Mr. H. Phillips Fletcher, F.R.I.B.A., the architect to the Carpenters' Company, who took the chair, in proposing a hearty vote of thanks to the lecturer, said that from his experience in different parts of the world, he believed that the British craftsman, when given the time and the opportunity, was still the best in the world, but that owing to the stress of modern conditions the men had fewer opportunities than heretofore. We all owe a debt of gratitude to the Carpenters' Company for stepping into the breach and trying to neutralise to some extent the decadence of apprenticeship by the establishment of their craft schools and the founding of lectures by eminent craftsmen.

CONTRACTORS' SECTION.

(MONTHLY.)

SOME PROS AND CONS OF THE INTER-TRADING RULE.

(*Contributed.*)

The Editor is not to be held responsible for the views expressed in this statement of the pros and cons of the Inter-trading Rule. At the same time he wishes it to be distinctly understood that this disclaimer is entirely without prejudice to either side of the argument. We shall be pleased to receive opinions on the subject.

The Master Builders' Association of Birmingham has recently decided to introduce the Inter-trading Rule, and the members have altered their rules to enable the scheme to be carried out.

The alteration was not made without a considerable amount of opposition; in fact, the resolution to introduce the rule was only carried by a majority of two. This, however, is double the majority by which a similar resolution was carried at Liverpool, where the rule has for some time past been in operation, and is working most satisfactorily, many of its former opponents being now among its strongest supporters, as they find that their association has increased in numbers, strength and financial resources.

Many of the Birmingham opponents were more opposed to the wording of the rule than to the principle of inter-trading. It certainly must be acknowledged that the wording is unfortunate, and open to criticism through its meaning not being sufficiently definite, and therefore liable to a wrong construction. It reads as follows:—

"Members shall not give or take tenders for any work to, or from, any persons who are not members of this or kindred associations connected with the building trade, and shall not employ such persons to do work for them."

Now, if taken literally as above, the rule apparently prohibits members from giving to, or taking tenders from, any but their fellow members. If this were so, it would not only be "inter-trading," but *exclusive* trading, more exclusive even than the co-operative movement, as members could only trade among themselves and do each other's work.

This, of course, is a *reductio ad absurdum*, and carries its own condemnation on its face, for though the rules *say* members shall only give tenders to other members, even the most stupid ignoramus or a judge over-particular as to the wording of rules and laws could not help but acknowledge that such was not the intent of the rule, otherwise builders who were members would be unable to submit tenders to architects or the general public.

The principal objections have been made by sub-contractors, whose position under the rule is not made particularly clear.

Of course, one of the primary objects of the rule is to induce all sub-contractors, as well as main contractors, to become members of the Master Builders' Association. As far as becoming members and paying their subscriptions is concerned, very few sub-contractors would object, but reading the rule as it is written, many have been under the impression that if they became members of the association they could not supply tenders to, or do work for, anyone but members of the association. This, however, is not the case; the rule really intends that they shall not act as sub-contractors to builders who are not members of some recognised association.

Of course, it would be impossible to persuade a person who does a considerable trade with the public direct to join an association if his doing so necessitated his giving up his ordinary trade. Let us take the case of a painter and decorator, for instance, who does a large private business in addition to taking sub-contracts from builders. Probably he would have very little objection to paying his subscription to the local association, but if on reading the rule that members shall not give tenders to any persons who are not members of the association he conceived the idea that he must either give up his private customers—as they are not members of the association—or the members of the association must refuse to accept tenders from him, he would doubtless hesitate before becoming a member; but as already explained, there is no intention of interfering in any way with his private business.

A suggestion was made some time ago as a good subject for a cartoon on the wording of the rule: A ragged little urchin addressing the proprietor of a joinery works and saw mills, says, "Please, sir, muvver wants to know how much saw-dust you can give her for a ha'penny?" The saw-mill proprietor replies, "Before I can give you a quotation, my boy, I must assure myself that you are a member of the local Master Builders' Association or of some kindred association affiliated to the National Federation." Of course, the whole point of this joke would be lost if the rule had been explicitly worded, instead of stating that members of an association shall not give tenders to *any persons* who are not members of some kindred association.

Another difficulty raised through the rule stating that work shall not be given to any non-members, was as to how far the rule could be carried. For instance, let us say the contractor has persuaded his sub-contractor, the painter and decorator, to become a member of the association. Now, it can be argued that having become a member, if he is to carry out the rule in its entirety, he must accept tenders only from other members, consequently he in his turn must persuade his paint merchant to become a member, also then the merchant must persuade the paint manufacturer, the manufacturers must persuade the colour makers and the oil producers, the colour makers must persuade the owners of the various coloured earths and chemicals from which the pigments are made—and so on. Then the railway company who carries the paint for the sub-contractor, and the haulier who carts it from the station must also be members, otherwise the sub-contractor, according to the rule "shall not employ such persons to do work for him."

But though the wording of the inter-trading rule is open to this argument, it is assuredly not the intent of the rule, which is to a certain extent qualified by the rule which follows, and refers to merchants becoming honorary members. Further, it may be definitely stated that the inter-trading rule is intended to be that which its name implies, viz., a rule for the inter-trading between contractors and sub-contractors without in any way interfering with their business among the general public.

It is to be regretted that the rule has not been more carefully worded, so that this fact might have been definitely expressed. It would not have been open to so much criticism and argument, and would have been definite and better understood had it read as follows:—

"Contractors who are members of this Association shall not take tenders from any sub-contractors who are not members of this or a kindred association connected with the building trade, and shall not employ such persons to do work for them, and sub-contractors who are members of this Association shall not give tenders to or do work for any contractors who are not members of this or a kindred association affiliated to the National Federation of Building Trade Employers."

There is, however, a real difficulty, and in fact the only difficulty, in the case of the "specialist" in some particular branch of the building trade—say, for instance, a hot-water engineer who refuses to become a member of any association. What will occur if an architect specifies that this particular man is to provide the heating apparatus for some contract which a member of the association has obtained? According to the strict reading of the inter-trading rule the builder would not be allowed to take a tender from him or employ him to do the work. On the other hand, let us suppose the hot-water engineer is a member of the association, and the sole agent for the patentee of some particular system of heating which has been specified, and that the contract has been obtained by a contractor who refuses to become a member of the association. If the hot-water engineer is to be bound by the inter-trading rule he would be compelled to refuse the non-associated contractor a tender, in which case he would soon find himself in hot water with the principal for whom he is agent.

It has, however, been stated that for the present all such instances shall be exceptions to which the rule shall not apply, being matters over which the members of the association have no control, and that further than trying their best to persuade the parties to become members they shall not be expected to go.

Such instances, however, will be rare, and may practically be ignored—at any rate until they appear, when each case would be treated on its merits.

If the spirit of the ideal inter-trading is carried out with reasonableness and loyalty, without taking too much notice of the strict wording of the rule, it will doubtless prove extremely beneficial, both to contractors and sub-contractors—sub-contractors will be induced to join the association, knowing that unless they do so they will not be asked for tenders by members of any association, who, after all said and done, form the majority of the builders both in numbers and influence, there being very few really large contractors who are not members of some builders' association. Further, the few contractors who have not yet done so, who have stood aloof without taking their fair share of the work and expense of the associations, though benefiting equally with those who have provided the funds and given their time—by the arrangements made with architects and with workmen for the betterment of the trade and the conditions of working—will be induced to join, knowing that unless they do so they must carry out the whole of their contracts themselves, or be satisfied to receive tenders from the limited number only of sub-contractors who are not members of some builders' association. Thus the associations would gain in numbers, in power, in influence, and in financial strength, and would then be in a far better position to negotiate with architects and with workmen for the introduction of many still needed reforms.

From the fact that the inter-trading rule has been carried out at Liverpool and other places for some time past without any friction, we may conclude that the committee responsible for its working have been moderate, and have used persuasion rather than force to carry out their desires, otherwise the rule would have caused a revolt, and brought about the ruin of the association, considering that there were originally so many opponents to it, and only a majority of *one* in favour of its adoption at Liverpool.

It is certain that there is nothing that an Englishman demands more strongly than liberty to carry on his own business in his own manner, and though the present wording of the inter-trading rule, until properly explained, apparently curtails that liberty, it is certain that in practice such has not been the case, consequently we can welcome with pleasure the continual introduction of this rule and its rapid spread among the various associations, feeling confident that the Birmingham committee will carry out the rule as judiciously and as reasonably as the Liverpool committee have done, and that now the Birmingham Association has followed the example of Liverpool, and decided to introduce it, most of the other Midland associations will do likewise.

ASCERTAINING THE VALUE OF FIRE BRICKS AND BLOCKS.

By Alfred B. Searle.

For reasons which it is difficult to explain, most users of firebricks appear to have very vague ideas as to the special characteristics which these useful articles should possess, and if the truth could be ascertained it is not at all improbable that many builders purchase their firebricks and backs for fireplaces for reasons which are wholly inadequate for distinguishing a low grade article, offered at a high price, from a first-class brick which may be purchased at a much lower price.

Are there any simple means by which a builder can tell the value of a firebrick without much expense? If so, it would pay him to employ such simple tests, as he would thereby save a considerable amount of money, more particularly when requiring only second-class firebricks for a particular purpose.

In the first place, it is not wise to place much reliance on the colour of a firebrick, for these articles are made for resisting heat and not for ornamental purposes, and even a badly discoloured firebrick can be whitewashed over after it has been built into position, if its appearance is of importance, as in a fireback. It is a fact, though few builders and users of firebricks appear to be aware of it, that the more discoloured a firebrick—in certain respects—the greater is its probability of resisting high temperature without shrinking. The reason for this is not difficult to understand.

A perfect firebrick would be composed of a perfectly pure clay, and would be entirely free from such fusible matter as felspar, and from such staining ingredients as iron compounds. No commercial clays used for the manufacture of firebricks are perfectly pure, and, consequently, when heated, the staining power of the iron compounds they contain is developed roughly in proportion to the temperature. Thus, a brick fired at a comparatively low heat during manufacture will be of a beautiful buff colour, without a stain upon it, yet the same brick heated to a point where it has ceased to shrink, on further heating at slightly higher temperatures may be covered with small irregular black patches and spots. Is the brick improved or spoiled by this additional heat to which it has been subjected?

From the point of view of appearance, its beauty is certainly diminished, and for ornamental purposes such a discoloured brick would be useless. For heat-resistance, on the contrary, the brick is improved. It is more closely knit together, its possibilities of skrinkage are reduced, and a rough but fairly certain sign of its power of heat-resistance is shown by the fact that it has already been highly heated, as shown by its "scorched" appearance. The nicely-coloured brick may be refractory, the ugly, spotted one is almost certain to be so.

By simple observation, it is thus possible to reject as "doubtful" all bricks which are suspiciously "clean" in appearance. The fact that they are so free from discolouration suggests that they have been fired at a comparatively low temperature, and whilst the makers may urge that this is done to save fuel, the wise user will prefer to select bricks which bear clearer marks of suitability for his purpose. He will not be misled into mistaking undeveloped defects for a sign of purity.

If a firebrick has large patches of black, or almost black matter of a slag-like nature on its surface, it may be regarded with suspicion, though for domestic architecture it will probably be of sufficient heat-resisting power. Nevertheless, a brick must be intensely darkened over almost its whole surface before the amount of impurity of a pyritic nature is so great as to materially affect its usefulness except in the case of bricks required for use with the highest temperatures.

The testing of firebricks to ascertain the point at which they are unsuitable for use on account of their becoming softened by exposure to heat is too delicate and difficult a piece of work to be undertaken by an ordinary builder, and, indeed, it is unnecessary except for those engaged in furnace construction and similar work. In any case this test can be made for a small fee by chemists who have been specially trained in the testing of refractory goods. Most firebrick manufacturers are quite willing to answer the question, "What will your bricks stand?" but many of the answers usually received are not borne out by actual test.

One reason for this is the existence of two scales of temperature—the Fahrenheit and Centigrade—and as a given temperature is represented by a number nearly twice as large in one case as in the other, it is not difficult to understand that a commercial traveller may forget which he is using. Thus many firebricks will stand exposure to a bright red heat corresponding to 1,650 Cent. without softening—a temperature equivalent to 3,000 Fah., but if a man states that his bricks will stand exposure to a temperature of 3,000 Cent. he at once places himself outside the limits of belief. Yet so hazy are the notions of many firebrick makers' representatives that great caution is necessary before their figures for the fusion point of their goods are accepted.

The behaviour of a brick under sudden changes of temperature is a matter of great importance in many cases, yet this is a characteristic which is peculiarly difficult to test. The rough method of pouring cold water on a red-hot brick is too severe for some purposes, and not by any means accurate enough for others. Fortunately, the temperatures met by most builders are not sufficiently great to make spalling a serious difficulty, though in connection with steel furnace construction it is of the greatest moment. It is most noticeable in bricks rich in silica.

Cracked firebricks and side dogs are a frequent cause of enquiry amongst householders, and the builder, for want of a better excuse, usually tries to explain that all firebacks crack with the heat, he being apparently quite oblivious of the fact that many do not crack, even after several years of constant use. When once a fireback has been constructed, there is no simple test which can be applied (without risk of spoiling it) though much may be gained from a close examination of the material. The more porous the material the less danger is there of its cracking; a dense back is almost certain to "fly" at the first time of heating.

The source of the clay from which firebricks are made is the best criterion as to its quality, though for domestic purposes it is often quite satisfactory to use bricks made from a local bed of what may be regarded as inferior clay, or from a mixture of clay of low heat-resistance and one of great refractoriness. Such mixtures are very common in certain parts of the Midlands and north-west. These "third grade firebricks" are often boomed as though they were superior to others made of the best materials, and as long as their price is reasonable there is no need for higher grade bricks to be used. It must however, be understood that when the greatest possible heat-resistance is required in a firebrick it is necessary to take elaborate precautions that only clays of the best class are employed in its manufacture, and that the moulding, drying, and burning of the bricks are carried out with the necessary skill. Such first-class firebricks are expensive, but for their special purposes they are undoubtedly the best. For work where the temperature is only moderate, as in a domestic fire-grate, a lower grade of brick is equally suitable.

Delicate measurements of the relative weights of different firebricks are beyond the facilities possessed by the ordinary builder, though here again a rough observation is of value. With two bricks of precisely the same size, the lighter one, being less dense and, therefore, more porous, will probably be the most suitable for moderate heat-resistance. The temperature of an ordinary coal fire, for instance, is so far below the lowest temperature at which a refractory brick worthy of the name will soften, that the actual highest temperature such a brick will stand is of small importance compared with its durability under the conditions existing in an ordinary open fire. It not infrequently happens that a clay with a low fusion point may prove more durable for such a purpose than one of greater ultimate refractoriness, but less able to withstand the constant heating and cooling.

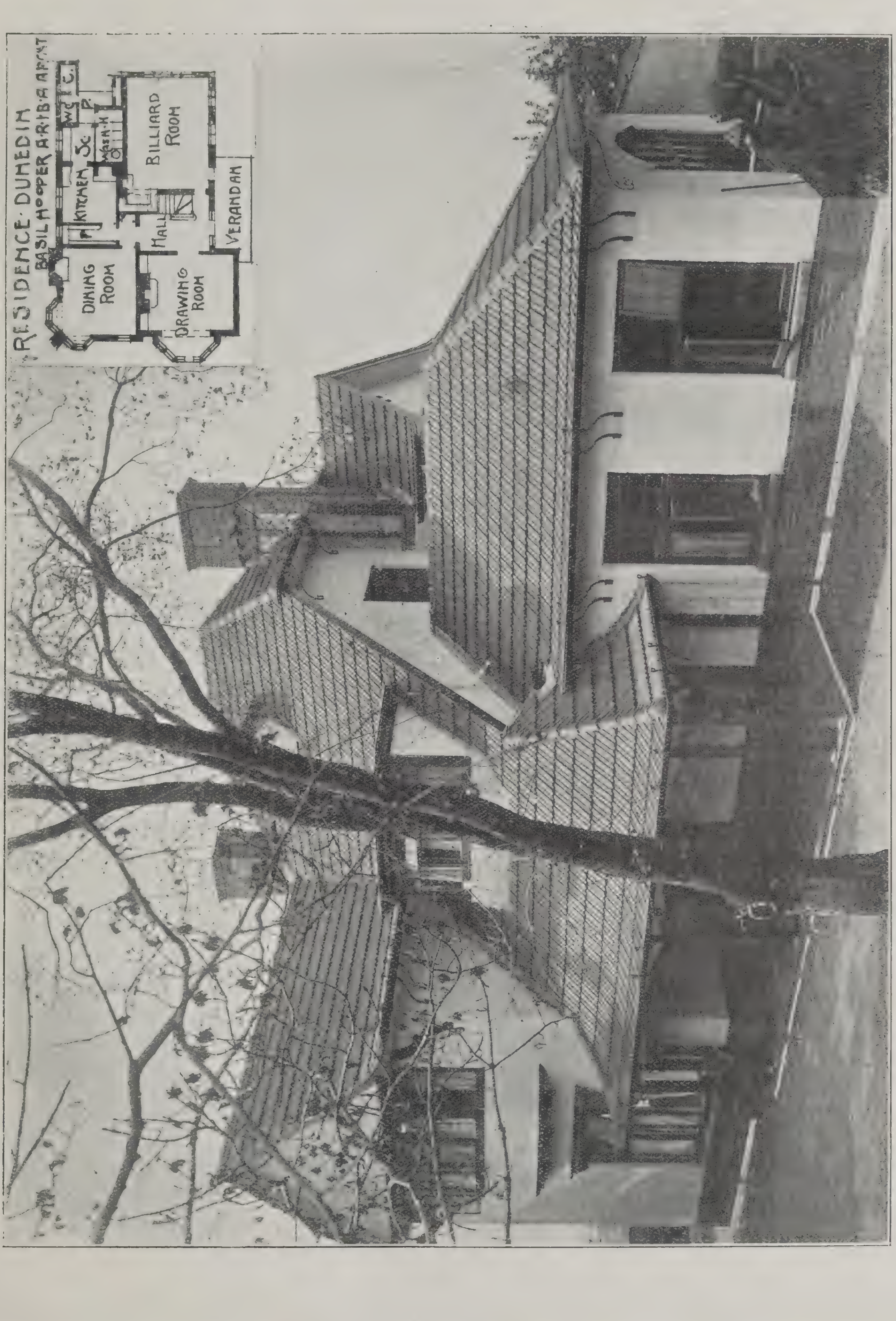
On this account many makers of firebricks and blocks mix sawdust with their clay, thereby making it lighter and more porous and so better suited for their intended purpose.

In purchasing firebricks, blocks, or firebacks for ordinary domestic buildings, the builder should see that they are light and porous, but should pay little attention to colour or to small black spots, except to regard them as signs of high temperature during manufacture, and as a sign of the manufacturer's confidence in the heat-resisting power of his wares.

NOTES ON PAINTING AND DECORATION.

The use of hand-stencilled friezes previously noted in these pages appears to be firmly established. Probably one reason is that they may be, and usually are, made specially for the room in which they are to be used. The work of stencilling by hand is done in the wall paper factory. Stencils made of very heavy copper are employed for the purpose, and the architect or decorator supplies the maker with a dimensioned sketch of the room, so that it is easy to place the stencils a little closer together, or further apart, as may be necessary to distribute the ornament nicely over the particular length of the room. These goods are not always expensive, although of course they cannot be considered cheap; but imitations, not altogether bad, may be had at very smaller prices. The actual stencilling is done by means of a large brush, measuring perhaps 4ins. across. This is fully charged with colour, and the workman is very readily able to graduate the colour by the simple means of pressing heavily when he wishes it strong, and gradually relaxing the pressure when he wishes to transfer less colour to the surface. Perhaps, however, the easiest and best means of obtaining a graduated effect, not only in stencilling work, but in all schemes of decoration, is to use that most ingenious little instrument known as the "Aerograph," by which colour is sprayed on to the surface. Many beautiful effects may be obtained by the use of this tool, which is now used to a considerable extent in most wall-paper factories, as well as by a great many of the leading decorators. Sponges, too, are used in hand-printed papers, to "wipe in" the colour, so to speak, and a combination of the stencil, the "Aerograph," and the sponge processes produces a result wholly unknown a few years back.

The charm in stencilled and other friezes depends to no small extent upon the surface which is used. Paper, of course, is largely employed, but many other materials are available. Coarse canvas, such as "Fab-ri-Kona," is now used extensively for decoration of dining and other rooms, picture galleries, etc., and is often employed perfectly plain for the walls, with a stencilled ornament on the frieze. The rough texture, which may be crudely described as a coarse sacking specially treated, breaks up the ornament, and, viewed at a distance, gives a very


RESIDENCE · DUNEDIN
BASIL HOOPER A·R·I·B·A ARCT
DINING ROOM
DRAWING ROOM
HALL
VERANDAH
KITCHEN
Sc
W.C.
C
P
WASH H
BILLIARD ROOM

artistic effect. Then Japanese grass cloth gives some very beautiful effects; while there is a very great variety of linen and other fabric papers, and metal effects, which may be used with good results for the same purpose.

Colouring Exteriors.

The question of how far colour should be used on the outside of buildings is one which has long been debated. Probably we use colour less than most other nations, although it would appear to be desirable to endeavour to brighten up our streets to some extent by the introduction of colour judiciously used. We have frequently called attention to the extensive use of stone colour, which is such a feature in London, although neutral greens, reds, and other colours may be employed with much better effect, even on old cement-faced houses, provided that care is taken to prevent their being too "muddy" on the one hand, and too glaring on the other. In ordinary brick buildings, there is not much left to paint excepting the sashes and the front door. If the frames are put in in black, or chocolate, and the sashes painted in white enamel or white zinc, the effect is usually very good, particularly when the sash bars are prominent. There is room for an increase in the use of the well finished front door. One now frequently comes across, in the West End, doors which are painted in rich deep reds, greens, blues, or browns. Such a door, properly finished, serves to brighten up the entrance; and if the surrounding woodwork be put in in white the result is always pleasing. If the door is an old one, with more or less elaborate moulding, the effect is even better. There is no difficulty in finishing doors in this way, and, considering how well they look and how long they last, they are cheap. The old paint-work must be stripped to the wood, and the surface be very carefully made smooth; any imperfection in this respect will spoil the finish. Three or four coats of paint are then given, each one mixed with much less oil than is usual when the work is to be finished without varnish. In fact, the best plan is to apply a coat quite flat, without any oil, other than that which is used in the grinding of the colour, a little gold size being added as a binder. The next coat can have just a little oil in it, so as to dry semi-flat; the next two should be quite flat. When dry, the surface should of course be rubbed down with very fine sandpaper before the next is applied, care being taken that no dust is left on the surface; then two coats of really good varnish complete the job. The varnish used should be that which is sold as "front-door varnish," for although it is somewhat expensive, the quantity required for a door is so small as to make this immaterial. The varnish treatment can be varied when more than one coat is to be used, by using for the first coat a rubbing varnish, and when dry rubbing it down with very fine powdered pumice stone and water, taking care to wash off thoroughly with chamois leather before the next coat is applied. If this is not done, the surface will show up gritty. A door finished in the manner described will last for many years, and if a suitable colour is chosen, will give just a touch of decoration to the front door which otherwise it would be difficult to obtain.

Paint Solvents.

In speaking of removing paint in a paragraph above, one is reminded of the great advance which has been made in recent years in the production of paint solvents, or removers. The old-fashioned system of using a torch, or charcoal fire, is still, of course, largely employed, but the objection to it is that disagreeable fumes are given off which are absolutely injurious inside the house; and then there is the danger of fire, and also the danger that a careless workman may burn through some of the finer mouldings. Paint solvents have been available for many years, and until comparatively recently they consisted of caustic lime and soda. The objection to this class is that the mixture is "sloppy" in use, and unless great care is taken to neutralise any of the alkali left on the surface after the paint is removed (which is done by applying a little vinegar and water), the subsequent coats of paint will be seriously affected. The next class of paint solvent consists of such materials as benzole, acetone, alcohol, etc., frequently mixed together. Their disadvantage is that when used on the outside they evaporate so quickly as to necessitate a considerable quantity of the spirit being used, with the result that the process becomes expensive. Some five years ago a patent was taken out for a paint remover, consisting of the usual benzole, etc., to which is added paraffin, Japan and Carnauba wax. This forms a thick coat which prevents the spirit from evaporating, and causes the paint to become softened in a very short time, depending, of course, upon the number of coats, and the age of the work. For ordinary three-coat work, probably ten minutes would suffice to soften the paint so considerably that it can be readily scraped off the surface, which is then rubbed over with a piece of rag dipped in benzine or turpentine, and is then ready for repainting. This class of paint-remover the writer looks upon as the best available, and its use is steadily increasing.

The Glazing Process.

Sometimes one has been asked how the particularly rich effect in coloured work, such as that just described, is obtained. The answer is by the process known as "glazing," which means that rich transparent colour is applied over a solid one of a more sombre hue. A good example is to use Indian or Venetian red for painting the door in three or four coats, perhaps a little lighter in the stiles and rails, and obtain the desired rich effect by giving a final coat of crimson lake or madder lake. These colours being somewhat transparent, the Venetian red shows through and forms a solid ground, while the brilliance of the lake is toned down at the same time. An almost infinite number of effects may be obtained by this process of glazing, and the subject is well worth looking into by those who have not previously studied it.

Zinc Oxide and Lithopone.

A lecturer at the Regent Street Polytechnic recently drew attention to the importance for architects, builders, decorators, and others of distinguishing between two pigments, which are both unfortunately referred to under the same name, viz., "zinc white." The two pigments are, rightly, zinc oxide and lithopone or sulphide of zinc. In view of the increased use of zinc paints generally, it may be well to point out here the difference between the two. Until about twenty-five years ago, the term zinc white always meant one material, zinc oxide, and many to-day so regard the term. A new pigment was, at the time mentioned, introduced, consisting of zinc sulphide and some seventy per cent. of precipitated or artificial barytes, with sometimes a small proportion of zinc oxide. The barytes in this case was practically the same as "blanc fixe," and should not be confused with ordinary barytes, which is used as an adulterant of lead. Moreover, in the lithopone the chemical constituents are precipitated together, and form a necessary part of the paint itself. Now as to the difference between the two. Zinc oxide is made by burning metal zinc (known as spelter), which converts it into vapour; and on this vapour being cooled, the zinc oxide of commerce is the result. There are various grades of zinc oxide; the best is pure white, far whiter for instance than white lead. Zinc oxide has no poisonous properties whatever, being absolutely innocuous. When ground in oil, it does not form an emulsion, or soap, as is the case with lead. Being practically inert, it forms a very durable paint, and has the valuable property of spreading over a surface much greater than lead, say, from 25 to 33 per cent. greater, so, although it is usually a little more expensive than lead, when its spreading property is considered, it really becomes rather cheaper. It is not affected by sulphur fumes, which abound in all large towns. A great many people seem to think it can only be satisfactorily used for inside work; as a matter of fact, it is one of the most durable paints for outside work. The reason for this popular error is readily arrived at. It is the lithopone or zinc white which is only suitable for inside work, and for that purpose a very cheap paint it is. It is the base of the best water paints on sale, and may be used with perfect satisfaction, but never outside, where it has a tendency to change colour, a defect which zinc oxide is wholly free from. During the last few years a propaganda has been carried on on a modest scale in favour of zinc oxide, and it is curious to note that architects and engineers who have looked into the question are still divided in opinion on the subject, and for a reason which may be summed up in the phrase "Once bitten, twice shy." An engineer of the writer's acquaintance became strongly opposed to zinc oxide, because he had, or he thought he had, used it on a large job, and it turned out very badly. On investigation, it was found that the paint he had employed was not zinc oxide at all, and it has been found in every case that has been closely investigated, that the same conditions existed, except perhaps that when zinc oxide has been employed and turned out badly, the mixing had been improperly done. Painters are a very conservative class of men and appear to think that because white lead is mixed by adding a quantity of patent driers, linseed oil, and turpentine, every other paint should be mixed in the same way, which is, on the face of it, absurd. Zinc oxide is bought very finely ground in linseed oil to a strong paste, and is made ready to use by thinning with refined boiled oil and very little turpentine, and no driers, except in bad weather, when a little zinc driers may be used.

Flat Enamel Finish.

Although raised paper of the series of beautiful relief decoration goods known as "Anaglypta," "Cordelova," etc., justly enjoy a very large sale, plaster work will always be employed in high-class buildings, because of the beauty of its finish. One can often notice that a beautiful ceiling made of "carton-pierre," with a plaster finish, is finished in distemper. This is all right for the first time; but when the ceiling becomes dirty, as of course it must do in time, and it is necessary to distemper it again, there is always the probability of the undercoat of distemper not being properly washed off, which means that the sharpness of the detail and the principal item of beauty of the ornament is therefore lost. Few decorators seem to recognise that by far the best way of finishing such ceilings is to use flat enamels, which may be had in white or pretty well any colour required. They dry quite free from gloss, and give all the appearance of distemper, excepting that they may, if necessary, be scrubbed, and the coat being very thin, there is no likelihood of the sharpness being lost, as when distemper is employed. Flat enamel may be used also with excellent effect in panel work in conjunction with glossy enamel on the stiles, rails, and mouldings; and, indeed, the two together produce very pleasing results.

Vermilion Substitutes.

One of the most ancient pigments known —namely, vermilion, appears to be very likely to disappear before very long, for the simple reason that substitutes that are just as permanent, and much cheaper, have been produced by the efforts of modern chemists. There are dozens of kinds of brilliant reds in various shades that may be had that are unaffected by acid, alkali, or sulphur, and are practically permanent, that is to say, as permanent as vermilion would be if exposed under similar conditions. The one disadvantage of many of these reds is that they are liable to "bleed," by which is meant, that if a coat of another coloured paint is applied over them, some portion of the red works through and shows up in small red specks, which suggests spots of blood. There are now at least two or three different kinds which have now been produced entirely free from this deficiency, and some experiments recently made show these to be quite reliable in this respect, while they have remarkably good body, or opacity, so that even a single coat covers the woodwork completely. In the majority of colours, too, there has been very marked improvement. Every reader probably has noticed how often greens when used outside fade after having been exposed for a year or so, the yellow in the green appearing to disappear, leaving the colour almost blue. The greens which are mostly subject to this are those known as "Brunswick greens," which are a cheap class of colours, but are used very extensively. Greens are now made that may be looked upon as permanent, and can be had in a variety of shades at a very small advance of price over the old-fashioned Brunswick greens. J.

PAINT & ITS APPLICATION TO STRUCTURAL STEEL

By Gaston Depierres.

Abstract of a portion of a paper read before the Paint and Varnish Society by Mr. Gaston Depierres, Vice-president.

What I am about to say is largely from a paintmaker's point of view, and is the direct result of study recently given to the manufacture and properties of structural steel, and the use of paint in its preservation. I therefore venture to hope that it may be of some interest to both paint manufacturers and paint users.

Flaws, Rust and Grease

are things that may destroy the work of the painter. No surface of structural steel ought to be coated with paint unless it shows the greyish-white, natural colour of the metal, and is absolutely free from traces of adherent acids and moistures. Yet, when unsatisfactory results are obtained, the paintmaker is generally the first one to be criticised, though most probably he has applied a perfectly good and suitable paint. Steel is perhaps the most tenacious of all known substances, having great cohesive force between its particles, so that they resist any effort to pull or force them apart; and as we fancy all matters to be in a state of motion at all times, the difficulty in preserving it by the use of paint is at once apparent. The defects in modern structural steel are largely due to mechanical working; that is, it is run out too hot or too quickly, and afterwards not properly housed and cared for. The enormous increase of late in its use in building and engineering construction demands increased vigilance and attention to its maintenance and present condition wherever it has been placed; as, either from corrosion, fatigue, vibration, or general deterioration, the metal may become so impaired as to be unfit to do that for which it was designed; and unless it is properly protected by coatings of paint at various periods, those entrusted with its care will assume the enormous responsibility of further catastrophes, entailing great expense, and, worse still, shocking loss of life.

Nature of Rust.

Notwithstanding what has been said by the eminent men who have treated this subject, practically only from the chemical point of view, I venture to say that to paintmakers and painters rusting must be understood to mean atmospheric oxidation and not corrosion by other agencies. Consequently, apart from chemical agents, water and oxygen are the primary causes of rust, with the contributory influence of atmospheric carbon dioxide (carbonic acid). Rust is hydrated oxide of iron; that is, a compound of the metal iron with oxygen and water; 100 parts ordinary iron rust, containing 52 parts of iron, 22 parts of oxygen, and 25 parts water. Water is here in a state of chemical combination, and not a mere mechanical adjunct in the form of moisture. Wherever rust has once formed, its further occurrence is a natural sequence; and its prevention becomes more difficult—in fact, impossible—unless the affected places are perfectly freed from all traces of oxide. So far from being a solid, coherent mass, rust is loose and porous, absorbing and persistently retaining water, which, with the help of atmospheric air, assists in the conversion of such portions of the iron which have hitherto remained intact.

Rust has a tendency to grow and spread out from a centre; hence a small spot of it on the metal extends itself under the paint, so that in time the paint will be flaked off, and the metal will have expanded. It is therefore essential for the proper upkeep of the steel structure that all rust-spots, of whatever nature, should be as early as possible prevented from spreading; and to this end they ought to be repaired at once, without waiting for all the old paint to disappear before laying on an entirely fresh coat all over. It is a remarkable thing that a speck of rust will sometimes strike through a coat of paint like a smoke stain through distemper in a ceiling; and this is, of course, more visible when white paint is used. When this is dry it is seen that the rust has turned the paint yellow.

Rusting Agencies.

I hardly think that we can accuse the oil or varnish, but am of opinion that it is most probably due to a certain percentage of water in a good many paints, though, of course, in a well-prepared paint, this should not be the case.

Various authors have advanced the theory that electrolytic action is one of the agencies for rapid corrosion. Like all other chemical reactions, rusting is no doubt accompanied by electrical tension, set up in the affected objects. This appears to me to be practically proved by the fact that in large steel structures the maximum amount of corrosion is to be found where two pieces of steel are attached together; this is especially noticeable round the rivet-holes, bolts, and nuts; hence the necessity for greater care to be exercised in their painting.

It is not by the massive pieces of an iron bridge, such as girders, stays, ties, and large visible portions, that the strength of the entire structure should be measured, but rather by the soundness of the numerous smaller component parts uniting the larger ones. Davy's discovery that steel knives and other articles can be protected from rusting by strips of zinc has led me to make various experiments in that direction; but I regret to say that I have been unable to obtain from them concordant results which might have helped to put this theory in practice in the preservation of structural steel.

An Important Point

to be noted in the formation of rust is the increase in volume of the iron concurrently with the progress of the rust formation. Ironwork embedded in fresh mortar or set in brickwork soon becomes attacked at the surface, and gradually the corrosion extends towards the interior—a circumstance that may become a great danger to the structure; and yet I notice almost daily all over this great city thousands of tons of steel girders being embedded without a particle of paint, or with a miserable coat of shop-paint given for appearance sake only, and having no protective value. Yet engineers and architects are supposed to draw proper specifications to protect their clients, and district surveyors are appointed to see on behalf of the public that structures are sound; but in many cases they seem to be unaware of the fact that in not insisting to have the steel structure carefully protected by several coats of paint, they assume the responsibility of many accidents and catastrophes which may happen in years to come.

The Cleansing of Steel.

The cleaning of structural steel is a problem for engineers, and yet how few have seriously set their mind to solve it in a logical and practical manner. Specifications are often very loose with regard to the manner in which the cleaning should be done before re-painting; when, as a matter of fact, no clause can be stringent enough, no inspection by the clerk of the works too minute, when the importance of the cleaning of steel before the application of paint is taken into consideration. Several methods are at present employed:—First, scrubbing or scouring with hard substances, such as pumice-stone, emery, etc. Secondly, scrubbing with wire brushes, and chipping with chipping hammers or steel scrapers made of old files; thirdly, pickling with acids; fourthly, cleaning by the sand-blast process.

The first method,

Scrubbing and Scouring,

cannot be recommended, as it offers the great disadvantage that it necessitates the employment of water or petroleum oil, which are often used to facilitate the removal of the iron rust. It is highly probable that this is the cause of many failures, since the labourers generally entrusted with the cleaning of ironwork can hardly be expected to know the meaning of absolute dryness. When this method is employed, a hot blast from a blow-lamp should be applied to the surface of the iron, to remove all moisture or burn off all traces of petroleum oil from its surface; but, unfortunately, this is seldom, if ever, put into practice on account of the expense of it. The pickling with acids is undoubtedly the process by which a thousand times as much new iron and steel is cleaned as by any other process. All work that is to be electro-plated, for instance, or that is to receive a coat of vitreous enamel, is cleaned in this way. No doubt an efficient cleaning is obtained by pickling in hot sulphuric acid or muriatic acid; but unless one is well prepared to neutralise thoroughly, and remove all traces of acid from the metal immediately after it is taken from the "bath," the result will be disastrous. Of all methods the cleaning by sand-blast seems to offer the most rapid, effective, and conomical means of preparing structural steel to receive a coating of paint. It leaves the metal not only perfectly clean, but dry, an important and essential condition if a receptive surface is to be secured. The painting of the metal should follow immediately after the cleaning, as the cleaning of the steel by this process roughens its surface slightly, and it is well known that under such conditions surface corrosion rapidly sets in.

It is argued that one of the disadvantages of

Sand-blasting

is the deleterious effect upon the eyes and lungs of the operator. This, in my opinion, can easily be overcome by means of suitable respirators, various kinds being now obtainable which would ensure complete immunity on that score. There is no doubt to-day that sand-blasting certainly offers the best means of cleaning old structures which are very rusty; and now that air-compressors, small oil engines, and electric motors of a portable kind are available, it is fair to presume that steel coatings will have better opportunities in the future to prove the life there is in them than they have had in the past; if the example that has been set before us by America for some years past is followed in England—to wit, the adoption of the method of cleaning by sand-blast.

Paint-making, and the Painting of Steel.

At one time paint-making was an art, then it became a trick, now it is a science. To-day paint-making has been rescued from the domain of empiricism, and has become an exact science. One skilled in it can now practise it with a certainty of results in exact proportion to his knowledge of its principles, and his ability in applying them to the work in hand. The theory that oil, or the binder, is the life of paint—that is to say, the thing that makes it wear—is to a certain extent misleading, and has been the cause of many of the blunders and failures with it in the past. I venture to say that an excess of linseed oil in paint is nearly as much an adulteration as the introduction of a useless or harmful pigment. We work upon the hypothesis that solids are co-efficient with the liquids in producing the best materials; and that the secret—if there be any—lies in the proper adjustment of the amount and kind of each needed to secure a perfect product.

(*To be continued.*)

THE FEDERATION WHO'S WHO.

Photo: Ruddock, Ltd.

Mr. STEPHEN EASTEN, President of the Northern Centre.

Mr. Stephen Easten was born at Lowick, Northumberland, and served his apprenticeship as a joiner at Norham-on-Tweed. He began business on his own account in Newcastle in 1888. Having been elected in January, 1906, by the Ward of St. Nicholas, as a member of Newcastle City Council, he was appointed chairman of the Estate and Property Committee in March, 1908. Mr. Easten, who is a past president of the Newcastle and District Building Trades Association (1906 and 1907), and of the Northern Counties Federation, is now President of the Tyne and Blyth District Building Trades Federation, and was appointed president of the Northern Centre of the National Federation in January, 1909. Among the large contracts executed by his firm (Stephen Easten, Ltd.) in Glasgow, are the Newcastle Corporation power station and offices, the Cathedral buildings, Milburn House, the Scottish Provident buildings, etc.

Photo: Stanley & Co.

Mr. JAMES DENVER, Secretary of the Northern Centre.

Mr. James Denver, of Manchester, entered the offices of Mr. John Tomlison, Manchester, in a junior position, in June, 1900, and thus became acquainted with the building trades employers' organisation. Since then he has taken a keen interest in association work, and he was appointed secretary for the Northern Centre of the National Federation of Building Trades Employers at Birmingham in July, 1908 in succession to Mr. John Tomlison, resigned. Mr. Denver was further appointed secretary for the Employers' Section of the Northern Centre Conciliation Board, in September of last year, also in succession to Mr. Tomlison.

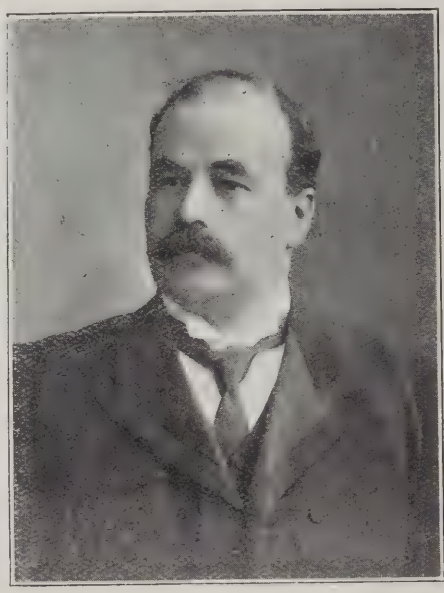


Photo: Medrington's, Ltd,

Mr. WILLIAM BULLEN, President of the Lancashire, Cheshire, and North Wales Federation.

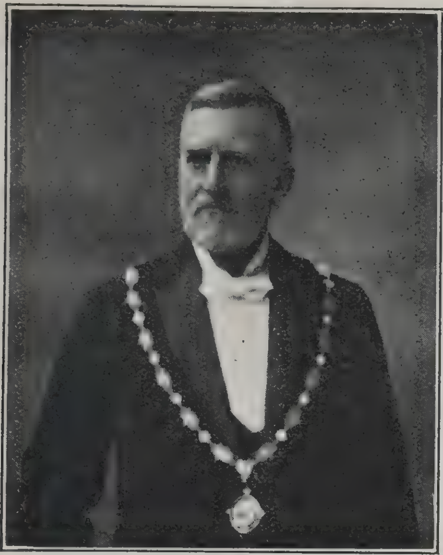
Mr. William Bullen, of Liverpool, rendered such excellent services to the Liverpool Association, that it was inevitable that he should be invited to accept the higher responsibilities involved in officially representing the Lancashire and Cheshire Federation. It was in 1894 that Mr. Bullen's firm joined the Liverpool Association, and he, as the active partner, at once took such interest in association business as marked him as an acquisition and as a future officer. He joined the Executive Council in 1902, in 1903 was elected a vice-president, and in 1905 became president. Here Mr. Bullen found ample scope for his energies, and he set himself to enlarge the membership of what was already one of the largest associations in the country. Ably seconded by the secretary, Mr. B. B. Moss, Mr. Bullen's efforts resulted in the addition of 114 new members during his year of office; and it is noteworthy that the president himself attended every one of the 62 meetings held. The members signalised their appreciation of Mr. Bullen's extraordinary success by electing him for a second term as president, this being the only occasion, since the association was formed forty-two years ago, on which such a distinction has been conferred. In his second year of office, Mr. Bullen had the satisfaction of seeing a further 101 new members added to the association, and again he did not miss a single one of the 81 meetings held locally. During this period he also attended Federation meetings in various places, and initiated a scheme by which the Mersey Federation, comprising the associations of Liverpool, Birkenhead, and Wallasey, was formed to secure uniform action in all matters affecting their mutual interests. On retiring from the presidency of the Liverpool Association, Mr. Bullen was presented with an illuminated address from the members; while to Mrs. Bullen, who ably seconds her husband's activity in public work, a silver rose bowl and vases were presented. As president of the Lancashire and Cheshire Federation, Mr. Bullen has continued to show the same productive activity, and he is carrying on an organisation campaign which will doubtless shortly show most gratifying results. Personally, Mr. Bullen infects those about him with an intense desire for achievement; but great as is his activity in this and other directions of public work, he looks upon such work as a relaxation and relief from the still greater energy with which he devotes himself to a large and increasing business. Happy the man who can make his "play" so useful!

Photo: Y. Burns.

Mr. JOHN TOMLISON, Secretary of the Lancashire, Cheshire and North Wales Federation.

Mr. John Tomlison was born at Preston, Lancashire, on August 10th, 1857, and entered his father's office at the age of fifteen, with the intention of following the business of a joiner and builder. Ill-health, which ultimately resulted in permanent lameness, caused his abandonment of this intention when he was about twenty-one years of age, and for the next twelve years he followed no occupation. In July, 1890, he accepted the secretaryship of the Preston Building Trades Employer' Association, then recently formed, with a membership of about thirty, and he has held the position until the present day. The membership has for a number of years averaged about 175. In 1894 he assisted in forming the old Lancashire Federation—the pioneer of the present system of national organisation—and he was appointed secretary in December of that year. When, four years later, an amalgamation took place with the Manchester, Liverpool and District Federation, under the present title of the Lancashire and Cheshire, he was appointed secretary of the reconstructed society. On the reformation of the old National Association of Master Builders, he was appointed secretary of the Northern centre council, and about the same time accepted the secretaryship of the Manchester and Salford Master Builders' Association, which, in conjunction with the Federation, opened offices in Manchester; Mr. Tomlison still continuing to reside at Preston. In 1904 he took an active part in the formation of the Federated Employers' Insurance Association, Ltd., to deal principally with building trade employers' risks, and for about two years he was one of the directors, resigning at the end of that period on account of differences of opinion with his colleagues. In 1904-5, Mr. Tomlison took part in the negotiations for the now established scheme of conciliation, intended to prevent strikes and lock-outs in the building trades, and on its adoption he was appointed Employers' Secretary of the National, Northern Centre, Manchester, and Preston Boards, but relinquished the secretaryship of the National Board about two years ago, and resigned the two Northern Centre secretaryships last year. Mr. Tomlison acted as secretary of the National Federation for a brief period during the interval prior to the appointment of Mr. A. G. White, but was prevented by a severe illness from attending the Dublin meeting.

NOTE.—The portraits of Mr. C. H. Barnsley, ex-President; Mr. Ernest J. Brown. the present President: Mr. S. Smethurst, Senior Vice-President. and Mr. A. G. White, Secretary of the National Federation, appeared in our Christmas Edition de Luxe.



Mr. W. R. THOMPSON, President of the Yorkshire Federation.

Mr. W. R. Thompson was born at Dewsbury in 1846, and commenced his business career by entering the office of his uncle, the late Mr. J. T. Rawsthorne, who was engaged in the stone, slate, and general building material trade, being also quarry owner and lime burner and slating contractor. Mr. Thompson gradually rose to be manager of the business, and in 1882 became sole proprietor. The business was established about 150 years ago, and has passed from uncle to nephew for three generations, Mr. Thompson being of the third generation. In 1880 Mr. Thompson paid a visit to Canada and the United States, visiting many of the chief cities, and going as far west as Winnipeg.

The deep interest which Mr. Thompson has always taken in association and federation work may be judged from the following appointments which he has held:—Yorkshire Federation, president 1908, treasurer 1899, 1900, 1901; National Association of Slate Merchants and Slaters, president 1898; president of Spen Valley and District Master Builders' Association; president of Spen Valley and District Accident Assurance Company, Ltd.

In local affairs Mr. Thompson has taken a great interest in the public library movement, having been a member of Dewsbury Public Library Committee since its foundation in 1890, and occupied the position of chairman for some years. His most interesting record, however, is in connection with technical education, he having been a member of the local committee for more than forty years, while at present he is chairman of the technical school, which is one of the most progressive and up-to-date schools in the kingdom, having an attendance of about 1,000 students. Mr. Thompson has also taken a great interest in Freemasonry, and is a Past P.G.O. of West Yorkshire.

We regret that the portrait of Mr. J. Davidson, Secretary of the Yorkshire Federation, has not reached us in time for publication in this number.

The Northern Counties Federation of Building Trade Employers.

The Northern Counties Federation of Building Trade Employers, which was founded in the year 1898, comprises the counties of Northumberland, Durham, Westmorland, and Cumberland, and the town of Middlesbrough. The associations governed by and affiliated to the Federation number eight, and (that of Middlesbrough excepted) these are outside the two counties of Northumberland and Durham. The membership, including individual members, is approximately five hundred. Within the Federation, for the maintenance of local working rules, etc., there are two district "associations of associations," viz., Tees-side Association, comprising the local associations of Middlesbrough, Stockton-on-Tees, and West Hartlepool, and the Tyne and Blyth District Federation, comprising the local associations of Newcastle-on-Tyne, North and South Shields, and Blyth.

Since the adoption of the scheme of conciliation boards for the building trade, those within the district have worked with satisfactory results.

The intertrading rule, with various modifications, has been adopted throughout the Federation, and has been the means of securing additional membership and strengthening the position of the associations.

The relations with the operatives have been undisturbed by strikes or lock-outs for some time, as the result of the operations of the conciliation boards, and of the absence of the aggressive tactics of the operatives so prevalent in the past when trade was brisk. The present depression has not been used by the employers to effect retaliation, as it has not been their policy to seek reductions in wages, but rather to secure more equitable and reasonable working rules, making for greater economy and freedom by avoiding waste and friction.

The work of organisation is proceeding, and there are hopes of securing the affiliation of the Darlington Master Builders' Association in the near future.

The funds are raised by annual subscription; the mode of fixing and raising the subscription being to ascertain each year the sum needed for the Federation, the Northern Centre, and the National Federation, and, on the basis of the previous year's wage-pay, to fix what rate per cent. of wages paid by the members will produce the sum required, and levy accordingly as the subscription for the year: the minimum subscription accepted from any member is one guinea.

During the year 1908, the following subjects have engaged the attention of the Federation: Conditions of contracting for public authorities; the adoption of the "Builders' Journal" as the official organ; collective bargaining for workmen's compensation insurance; furnishing evidence with respect to accidents in the building trades; the consideration of decision not to seek reduction in the wages of the operatives; the conduct of proceedings before the conciliation Boards; the question of fair terms for sub-contractors; and the adoption of the intertrading rule in the district.

It is now well recognised that the Federation is not a philanthropic institution, but underwrites many of the risks of contracting, in the sense that it protects contractors against the aggressive tactics of operatives, against unfair stipulations by building owners and architects, and against many other contingencies; so that the organisation has not only justified its existence, but has proved itself an absolute necessity to the trade.

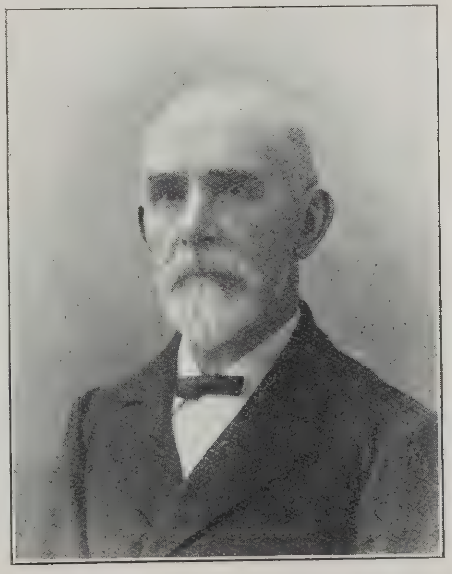


Photo: Thirlwell & Co.

Mr. JOHN DAVISON, President of the Northern Counties Federation and of the Stockton and District M.B.A.

Mr. John Davison, builder and contractor, of Stockton-on-Tees, began business forty-four years ago, and has executed several of the largest contracts in the town and district, including the post office, the Friends' Meeting House, the Y.M.C.A. building, Lightfoot Grove Chapel, Park Buildings, Middlesbrough County Court, Middlesbrough post office additions, a Baptist Chapel at West Hartlepool, Deanbank Chapel, Ferryhill; addition to Northallerton Tarpaulin Works, additions Stockton Higher Grade Schools, etc., etc. He was one of the builders present at a meeting, on April 30th, 1890, to commence an association. This association, which seems to have collapsed the same year, was resuscitated on May 4th, 1893, when Mr. Davison was chairman of the meeting. This association met with varying success up till October, 1896, when Mr. Davison undertook to act as hon. secretary, as well as holding the office of president. From that time the association steadily improved. Almost every builder in the district is now a member, and the association is financially prosperous. In February, 1897, the present secretary, Mr. W. C. Creasor, was appointed, and Mr. Davison was re-elected president, an office to which he has annually (despite his protests) been re-elected. Mr. Davison was also the first president (in 1897) of the Tees-side and District Association, which includes Stockton, Thornaby, Middlesbrough, Hartlepools. He took an active and prominent part in the formation of this Association, and also of the Northern Counties Federation, of which he is now president. Mr. Davison rarely misses a meeting, and his work has helped in no small degree to the successful organisation of this district.

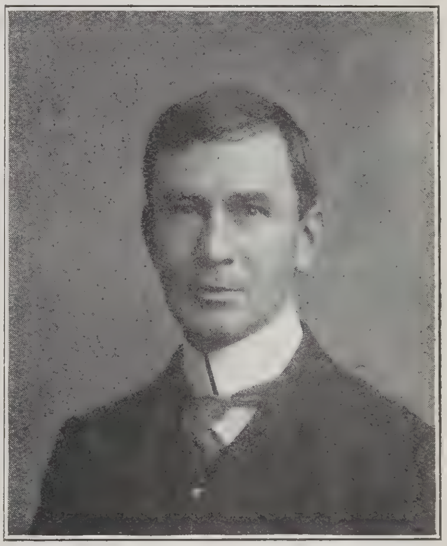


Photo: French

Mr. WILLIAM HENRY HOPE, Secretary of the Northern Counties Federation.

Mr. William Henry Hope is the son of a solicitor, and was born at Sunderland on July 9th, 1872. His education, commenced at the Sunderland High School, was completed at Durham University. He left Durham to take up an appointment in poor law service, in which he laid the foundation of his knowledge of poor law practice and procedure, in which he is a recognised expert. After serving articles in Sunderland and London, Mr. Hope was admitted a solicitor in 1897, and soon after starting practice was appointed secretary of the Sunderland Master Builders' Association, and by his tact and firmness and organising abilities so won the confidence of the trade that he was later appointed to a similar position successively by the Tyne and Blyth Federation of Building Trade Employers, and the Northern Counties Federation of Building Trade Employers, and he holds these three secretaryships at the present time. Mr. Hope, in addition to his building trade appointments, carries on with his partner Mr. Ritson an extensive general legal practice in Sunderland, is solicitor to the Sunderland Rural District Council, and still holds several appointments under the Poor Law administration. Mr. Hope's abilities have received recognition from his brother Poor Law officers, and he is at the present time president of the Northumberland and Durham Poor Law Officers' Association, and senior vice-president of the National Poor Law Officers' Association. Mr. Hope has been a member of the Sunderland Borough Council since 1903, when he was elected as representative for Central Ward, defeating his opponent, who stood as a Labour candidate, by a majority of nearly two to one. Upon coming up for re-election in 1906, Mr. Hope's return was unopposed. Mr. Hope is a prominent and enthusiastic Freemason, a Past Master of the Phœnix Lodge and the Thornhill Lodge, and has this year attained to provincial office in the craft.

TIMBERS OF COMMERCE: SOURCES OF SUPPLY.

Mr. H. J. Elwes, F.R.S., lecturing on "Timbers of Commerce: Their Present and Possible Future Supply," at the Carpenters' Hall, London Wall, E.C.. on March 18th, remarked that since 1900 he had been studying trees which may become the timber trees of Great Britain. Recalling a lecture which he gave at the Surveyors' Institution five years ago on timber trees that can be produced in Great Britain, but had been ignored, he remarked that it is useless to blind ourselves to the fact that we cannot compete, either in quality or in price, with some other countries in the economical production of timber. He was convinced that we can only compete with other countries in the economical production of a few hardwoods—oak, elm, ash, sycamore, and walnut. The afforestation of waste land, and the proper planting of trees thereon, can never be remunerative.

Briefly reviewing the principal sources of our timber supplies, he remarked that 90 per cent. of our timber comes from Northern Europe, Sweden, Finland, and Russia. Scotch pine and spruce cover millions of acres of land where agriculture is impossible. These forests will, he said, always be the future sources of our supplies. Larch comes in limited qauntities from the White Sea, but competition in this timber will never be so severe to the British landowner as that which involves pine and spruce. Taking the Mediterranean and the Black Sea, these, he said, are important as regards the production of oak. Known as "wainscot," oak has, on account of the various good qualities which it possesses, endeared itself to the architect and the joiner, and has consequently become dear. How long supplies will last it is difficult to say, but the French have bought large quantities, seeing the scarcity of oak in their own country.

The lecturer next referred to an oak, called brown oak, which has been ignored by our architects, but very much appreciated by the Americans, who consider it the best for decorative purposes. Manchuria and Korea have large forests, used by the Japanese. No people have more skill and taste in woodwork than the Japanese. They never use plaster, but substitute wood, which they never paint or varnish, depending for effect upon the grain. Dealing with Japanese timbers, he remarked that he did not think there were any conifers which will be used in England for fine work. Among the hard woods, of which there are many, there are none which have been brought into our markets in large quantities. The tropical forests of Southern Asia produce many timbers which will become very valuable, but we must never expect to get supplies of tropical hardwoods equal in size and quality.

Having briefly reviewed the possibilities of the supplies from Borneo, Sumatra, and the Andaman Islands, the lecturer proceeded to deal with the timbers of India, whose forests are better known than those of any other tropical country. She sends us, however, little but ebony, rosewood, and satinwood.

Then we come to North America, which next to Northern Europe, gives us the largest of our timber supplies. The forests, however, have been so recklessly exploited, and such large quantities have been destroyed by fire, that they are approaching exhaustion, and others are being used as substitutes. In spite of the opinion of many eminent writers, the lecturer remarked that he could not see any imminent danger of the supply failing. The two American pines that we know best are white pine and pitch pine. The former is so high in price that it is only used for first class work by cabinet-makers. Pitch pine, however, is used generally. There is no tree, the lecturer said, whose forests have been so depleted as those of pitch pine. As for American spruce, it covers enormous areas in Canada, and though the consumption has been enormous (it being the principal wood used for making paper), experts agree that owing to the rapid way in which it is reproduced, there is enough to last for ever. Of the American hardwoods, the chief are white oak and red oak, so much of which has been used lately that the supply will not last; and this should be one of the greatest inducements to English landowners not to sacrifice the valuable oak at the low prices at present obtaining. English oak is, and will remain, the best timber for certain uses.

After enumerating many other woods, he drew attention to the fact that English ash for oars is as good as, if not better, than any American ash, and as the American supply is likely to fail, the development of ash in England should be encouraged. Passing on to the Pacific Coast of North America, of which Oregon pine is the most important timber, he remarked that, although the quantity felled is enormous, and although large quantities are destroyed by fire, yet the reproduction is so rapid that, with good legislation, there will be a good supply for an indefinite period.

With regard to the West Indies and Central America, there is no information about mahogany to enable one to forecast the supply from these districts in the future, as this seems to depend largely on the cost of labour and transport. Greenheart, on account of its great strength, is one of the most valuable woods we have, and the supply seems to be getting exhausted in the accessible parts of British Guiana. The West Coast of Africa has been, in late years, the principal source of our mahogany supply, and to-day probably three-fourths or two-thirds of it comes from that quarter. Madagascar is full of woods of which we know almost nothing.

Then we come to Australia and New Zealand, and this is a subject which would require an evening to itself. Their timbers are very little known, and none of the Government publications give any idea of what the future supply is likely to be. Some interesting samples of the various woods alluded to in the course of the lecture were on view round the hall, and frequent reference was made to them by the lecturer during his discourse. The chair was taken by Sir Hugh Beevor, Bart., M.D., etc.

Coming Events.

Wednesday, April 7.

NORTHERN POLYTECHNIC ARCHITECTURAL AND BUILDING STUDENTS' ASSOCIATION.—Lecture on "The Hennebique System of Reinforced Concrete," 8 p.m.

EDINBURGH ARCHITECTURAL ASSOCIATION (117, George Street).—Associates' Business Meeting, 8 p.m.

INSTITUTION OF CIVIL ENGINEERS (Great George Street, Westminster).—Students' Visit to the Chingford Reservoir Works of the Metropolitan Water Board.

Thursday, April 8.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS (University, Western Bank).—Annual Meeting.

PAINT AND VARNISH SOCIETY (St. Bride's Institute, E.C.).—Mr. W. G. Aston on "Lakes," 8 p.m.

Saturday, April 10.

EDINBURGH ARCHITECTURAL ASSOCIATION (117, George Street).—Visit to St. Catherine's and St. Margaret's Convents: Leader, Mr. Archibald Macpherson, F.R.I.B.A.

Wednesday, April 14.

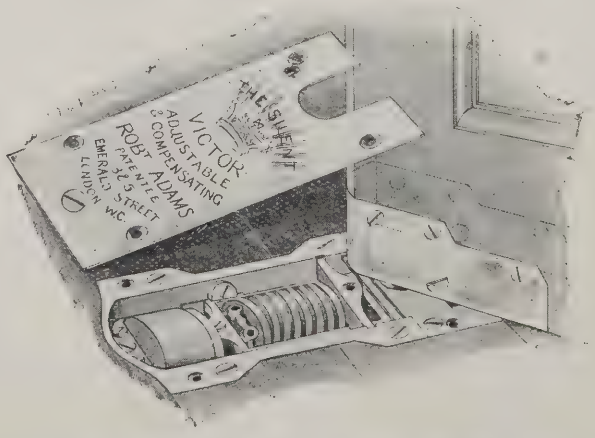
EDINBURGH ARCHITECTURAL ASSOCIATION (117, George Street).—Annual Business Meeting and President's Address, 8 p.m.

Saturday, April 17.

NORTHERN POLYTECHNIC ARCHITECTURAL AND BUILDING STUDENTS' ASSOCIATION.—Visit to Lambeth Palace, 3.30 p.m.

BUILDING TRADES' EXHIBITION AT OLYMPIA. Opening Day.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.
PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE, with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.
60 HIGHEST AWARDS.
The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing.
— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

THE NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS OF GREAT BRITAIN AND IRELAND.

OFFICERS, ETC., 1909.

President:
ERNEST J. BROWN (London).

Senior Vice-President:
Councillor S. SMETHURST, J.P. (Oldham).

Junior Vice-President:
J. W. WHITE (Sunderland).

Hon. Vice-Presidents:

ROBERT NEILL, J.P. (Manchester).
J. HOWARD COLLS (London).
County Alderman J. BOWEN, J.P. (Birmingham).
T. F. RIDER, F.R.G.S. (London).
J. STEVENSON JONES (Liverpool).
Alderman W. HOLDSWORTH, J.P. (Bradford)
A. KRAUSS (Bristol).
B. I. GREENWOOD (London).
C. W. GREEN (Liverpool).
Alderman W. H. JESSOP, J.P. (Huddersfield).
WM. SHEPHERD (London).
GEO. MACFARLANE (Manchester).
WM. NICHOLSON (Leeds).
C. H. BARNSLEY (Birmingham).

Hon. Treasurer:
JAMES WRIGHT (Nottingham).

Hon. Auditors:
F. HIGGS (London) and W. THOMAS (Cardiff).

Representatives on the Employers' Parliamentary Council:
ERNEST J. BROWN (London). WM. SHEPHERD (London).

ADMINISTRATIVE COMMITTEE.

President:—ERNEST J. BROWN (London).

Senior Vice-President:—S. SMETHURST, J.P. (Oldham). *Junior Vice President:*—J. W. WHITE (Sunderland).

Hon. Treasurer:—JAS. WRIGHT (Nottingham).

Senior Hon. Auditor:—F. HIGGS (London). *Junior Hon. Auditor:*—W. THOMAS (Cardiff).

NOTE.—The above-named are Members *ex officio*.

ELECTED MEMBERS.

Northern Centre—T. Wilkinson (Middlesbrough). W. R. Thompson (Dewsbury). George Macfarlane (Manchester). Jas. Storrs, J.P. (Stalybridge).

Midland Centre—H. Willcock (Wolverhampton). Albert S. Smith, (Birmingham).

South-Eastern Centre—Wm. Shepherd (London). W. F. Wallis (Maidstone). B. I. Greenwood (London). J. Bell, J.P. (Cambridge).

South Western-Centre—Coun. W. N. Blackburn (Newport, Mon.). E. J. Neale (Bristol).

Secretary:
A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

MONTHLY OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

Enquiry forms have been issued to the associations through the various Federations requesting information as to current rates of wages and hours of labour, for publication shortly in the form of a comparative statement.

The Sweated Industries Bill at present before the House of Commons has been considered, and objections have been formulated and conveyed to Members of Parliament likely to render assistance in opposing the objectionable features.

It was reported last month that communications had been addressed to the War Office and Post Office *re* their asking for tenders without quantities. A reply has been received from the former to the effect that, as far as practicable, in future quantities will be supplied for works of over £500 in value.

A dispute with plasterers occurred at Swansea owing to a sub-contractor employed by one of the Swansea members employing labourers to do plasterers' work. The matter has now been satisfactorily adjusted.

The secretary attended a conference of the secretaries of the Midland Centre at Birmingham on March 25th, and contributed a paper. The meeting was well attended, and a good and useful discussion took place.

On the following day he attended a meeting of the Nottingham Association, and contributed a paper on the intertrading rule. After an interesting discussion, it was decided that it was advisable to adopt the rule in Nottingham, and the further steps to be taken were referred to the executive committee.

The secretary also attended the annual dinner of Cambridge Association.

The president (Mr. E. J. Brown) attended the annual dinner of the Bristol Association on March 30th.

The Trade Disputes Bill, which seeks to make arbitration compulsory in trade disputes on the application of either party, has been considered, as the Bill in its present form would, if it became law, be likely to interfere injuriously with all existing voluntary schemes of conciliation. This objection has been laid before the Employers' Parliamentary Council, with a request that an amendment should be sought providing that such legislation should only become operative after existing voluntary conciliation boards have failed to settle the dispute.

Members are again reminded that arrangements have been made for a party of our members to visit the International Building Trades Exhibition on the evening of April 20th, at 5.30 p.m., on the invitation of Mr. H. Greville Montgomery, M.P., one of the directors. Although it is desired as far as practicable to arrange the visit as above, the tickets are really available any time, and those who find the evening time inconvenient can suit their own convenience. Tickets on application to the secretary.—A. G. White, secretary.

THE NORTHERN CENTRE OF THE NATIONAL FEDERATION

COMPOSED OF

The Lancashire, Cheshire and North Wales Federation, The Yorkshire Federation and The Northern Counties Federation.

Secretary: JAMES DENVER, Cromwell Buildings, Blackfriars Street, Manchester.

Northern Centre Board of Conciliation the Building Trades.

The Court of Arbitrators appointed by this Board to investigate into the case reported in the issue of this Journal for March 24th last, in which the Liverpool Stonemasons' Society claim a firm, members of the St. Helens Association, to be Liverpool employers, have now given their decision, and find the said firm to be Liverpool employers as claimed.—JAMES DENVER, Employers' Secretary.

THE LANCASHIRE, CHESHIRE AND NORTH WALES FEDERATION

Secretary: JOHN TOMLISON, Cromwell Buildings, Blackfriars Street, Manchester.

The monthly meeting of the Administrative Committee of this Federation was held at the Board-room, Blackfriars Street, Manchester, on Friday afternoon, March 12th, when the president (Mr. William Bullen) presided over an attendance of eleven representatives.

Matters arising out of the publication of the half-yearly reports were discussed, and resolutions passed thereon.

The accounts for the quarter presented by the secretary were recommended to the Executive Board for payment.

The April monthly meeting was postponed until the 16th, owing to the usual date falling on Good Friday.

Some discussion took place on the position of ex-presidents on the Administrative Committee, and it was agreed to place the matter on the agenda for the quarterly meeting of the Executive to be held on March 29th at Blackburn.

A deputation attended from the Bolton Association with reference to a case of one of their members who had signed a contract appointing the architect as the sole arbitrator, and he had refused to allow for extras for a very considerable sum. After hearing the deputation, it was agreed to have the opinion of a solicitor and counsel on the case if necessary.

Circular letters were read from the National Federation with reference to the International Building Trades Exhibition and the official journal.

The proposed new rules of the Accrington Association, and the revised rules of the Radcliffe Association, were before the committee for approval, and after some discussion, it was left to the secretary to write to the respective societies pointing out several matters for their reconsideration.

The quarterly meeting of the Executive Board of this Federation was held at the Old Bull Hotel, Blackburn, on Monday, March 29th, when the president (Mr. William Bullen) presided over a fair attendance of members.

The secretary reported that he had received several suggestions from local associations for amending the National contract form, and it was agreed to forward the same to the Administrative Committee with a recommendation that they be laid before the National Federation for their consideration.

The Administrative Committee were instructed to redraft Rule 9, and to give formal notice for amending it with regard to the formation of that committee.

The revised rules of the Lancaster, Radcliffe, and Accrington Association were approved and adopted.

The secretary reported that he had received notice from the Federated Employers' Insurance Association, Limited, for amending the Federation Agreement and rates, and he was authorised to call a meeting of the Insurance Comittee at an early date to give the same consideration.

The Blackburn employers were invited to meet the committee to discuss trade matters and the desirability of again becoming affiliated to the Federation, but there was only a small response, and nothing formal was done in this direction.—JOHN TOMLISON, Secretary.

THE YORKSHIRE FEDERATION.

Secretary: J. DAVIDSON, 14, Park Road, Leeds.

The monthly meeting of the Executive Council was held at the Builders' Exchange, Northumberland Street, Huddersfield, on Thursday, March 18th. Mr. W. R. Thompson, president, occupied the chair, and thirty-nine delegates from affiliated associations were present.

The president referred to the loss which the Federation and the Hull Association had sustained by the death of Mr. Goates, of Hull. He moved that an expression of the deep sympathy and condolence of the Federation be tendered to the relatives and the Hull Association. The resolution was seconded by Mr. Biggin and passed in silence.

The treasurer reported receipt of £8 10s. on reserve fund account, and £123 12s. on account of subscriptions. He tendered his sincere thanks to the local associations who had so generously responded to his appeal for an early remittance on account of subscription for the current year.

Correspondence from the Hull Association was read containing suggestions for amendment of the National form of contract. Messrs. E. Quibell and J. T. Levitt referred to the same, and emphasised the importance of obtaining their incorporation if at all possible. On the motion of Mr. A. W. Sinclair, seconded by Mr. E. Quibell, it was resolved to request the other local associations to forward their suggestions for amendment, alterations, and additions to the Federation secretary at the earliest possible date, and that these be considered by the Emergency Committee with a view to a report being presented to the Federation.

The written observations of the Barnsley and Wakefield Associations on the expediency of obtaining a declaration from workmen on entering employment were read. A discussion ensued, and it was ultimately resolved, on the motion of Councillor W. G. England, J.P., seconded by Mr. J. Biggin, to defer the consideration of the question until the replies of the local associations are received.

A draft sub-contract form had been prepared, and a copy forwarded to each representative and secretary of local associations. One or two suggestions for amendment were

ROBERT HALL,
Building Surveyor,
52, Frederick Street, BURY.

With over 35 years practical experience of the Building Trade, and during the last 15 years a very varied experience in measuring up and adjusting contract and other accounts, is prepared to undertake and submit quotations for the following :—

The Measuring-up and Adjustment of Accounts,
Collection and Settlement of Accounts,
Assistance given in Estimating,
Annual or other Periodical Stocktakings,
Private Enquiries and Arbitrations undertaken,
or any other special work incidental to that of a Builder or Contractor.

52, Frederick St., BURY.

NATURAL ROCK ASPHALTE
(Compressed or Mastic)
For Horizontal and Vertical Damp Coursin
For Flat Roofs, Basements and other floors.

The French Asphalte Co., Ltd.
(ESTABLISHED 1871)
Supply only the best material from their own mine of St. Jean de Maruejols, combined with the best workmanship.
Complete satisfaction given to the leading Architects.

Apply for Prices:—
5, Laurence Pountney Hill, Cannon Street, E.C.

D. LORDEN,
Plasterer,
Plaster and Cement Merchant
Worker in Fibrous Plaster &c,
Tom Brown Street, RUGBY.

For Architects, Builders and Engineers.
TRUE TO SCALE.
BLACK LINE PRINTS.
Permanent. *Done on any Paper or Cloth.*
R's Method of Perspective.
WRITE FOR PARTICULARS.
W. F. STANLEY & CO., LTD.,
13, Railway Approach, London Bridge.
Tel. 871 Hop. Telegrams. "TRIBRACH, LONDON."

T. N.: 14410 Central. T.A.: "Coatostone, London."
Coatostone
LIQUID STONE
NEAL'S PATENT.
Applied as Paint for Coating
Plaster, Cement, Stone or Woodwork
to produce a natural Stone effect
FOR INTERIOR OR EXTERIOR WOR
THE COATOSTONE DECORATION CO.
77, Mortimer Street, Regent Street, W.

"The Architectural Review."
A Magazine of Architecture and Arts of Design. Edited by MERVYN E. MACARTNEY, B.A., F.R.I.B.A., F.S.A.
Price 1/- Monthly. Annual Subscription 16/- post free.
Technical Journals, Ltd., Caxton House, Westminster.

made, and it was resolved, on the motion Mr. J. T. Levitt, seconded by Councillor W. G. England, J.P., to refer the matter to the Emergency Committee for further consideration and report.

A letter from Mr. A. G. White, the National secretary, was read, as to reference being made on the official stationery of the various Federations and local associations as to "The Builders' Journal" being the official organ. It was resolved, on the motion of Mr. J. S. Myers, seconded by Mr. C. Bent, that when further supplies of stationery are being ordered for the Federation, the following words be printed: "'The Builders' Journal' is the official organ of this Federation.'"

It was reported that the income from advertisements would probably defray the cost of the printing of the new issue of the Federation Directory. On the motion of Councillor W. G. England, J.P., seconded by Mr. J. T. Levitt, it was resolved to request the affiliated local associations to take a copy for each member on preferential terms of 2d. each, exclusive of carriage; and that single copies be supplied at 6d. each. It was further resolved, on the motion of Mr. A. J. Forsdike, seconded by Mr. S. Coop, to draw attention in the directory to "The Builders' Journal," and invite members to become subscribers in order that the National Federation may derive the fullest advantage from the arrangement with the proprietors of the journal.

A letter on the Housing, Town Planning, etc., Bill, which had been addressed, on behalf of the Federation, to the President of the Local Government Board, and handed to Mr. Burns personally by the secretary of the Employers' Parliamentary Council, was read. Reference was made to the strong opposition from many sources which was being made to the clause providing for a quinquennial survey, which, although included in the Government Bill in fulfilment of a promise, it was understood met with the opposition of the Local Government Board.

A letter from the National secretary, containing particulars of the action taken by the National Federation and the Employers' Parliamentary Council arising out of a motion by a Labour member asking the House to practically base the fair wages clause on trade union conditions and wages was read. Owing to the opposition of the Government, the motion was subsequently withdrawn, and one submitted by the Government was unanimously approved.

It was reported that the Observations of the Employers' Parliamentary Council on Bills in Parliament had been supplied to each local association and representative, which Observations included the following among other Bills: (a) Sweated Industries, (b) Trade Disputes.

A letter was read from the secretary of the Sheffield Association, enclosing a communication which had been received by him from one of their associate members, drawing attention to the action of the Bridlington Association. It was stated that two of their customers in Bridlington had been officially requested by the secretary of the Bridlington Association to attend a meeting, and show cause why they had accepted a tender from a firm who were not members of the local association, or had a local establishment. Mr. Robinson, of Bridlington, stated that their members did not object to fair and open competition of bona-fide building trade employers, who were members of local associations affiliated with the Yorkshire Federation. In the case in point, however, the firm who had made the complaint were timber importers and slate merchants, and the members of the Bridlington Association considered it a most objectionable practice that merchants who supplied building trade employers with materials should also enter into direct competition with them to secure work on which their livelihood absolutely depended. They had referred to the last issue of the Yorkshire Directory, and could not find that the firm in question was included among the members of the Sheffield Association.

Mr. Forsdike, on behalf of the Sheffield Association, pointed out that the firm in question had joined the Sheffield Association when they commenced business. They had appealed to the association for their support, and the cause of the objection of the Bridlington Association had not been previously explained. They were originally under the impression that the objection was based solely on the fact that the firm in question were not members of the Bridlington Association. Seeing that the ground of objection was the direct trade competition of builders' merchants with building trade employers, he would withdraw the particular case at present, in order that it might receive further consideration by the Sheffield Association. At the same time his association desired a clear and definite statement of the benefits and recognition which the associate members of a local association were entitled to receive from the federated associations. They therefore asked for expressions of opinion, or an officially authorised statement, as to the reciprocal relations under the inter-trading rule between associate members of local associations affiliated with the Federation. In order that the inter-trading rule might be discussed in all its bearings, it was resolved, on the motion of Councillor J. Dawson, seconded by Mr. P. Rhodes, to request the local associations to give the rule and its scope most earnest consideration, and favour the Federation with their observations and recommendations as early as possible.

A letter was read from the Sheffield Association with respect to the arrangements which had been made between the Sheffield Corporation and the association with respect to the erection of hoardings.

The president reported that the Emergency Committee had considered the documents in the York case, and that a draft statement for submission to counsel had been prepared and was receiving careful attention. Mr. Coop, president of Dewsbury Association, invited the Federation to hold the next meeting in that town; and on the motion of Councillor J. Dawson, seconded by Mr. J. Biggin, the invitation was cordially accepted, and the meeting fixed for Thursday, April 15th.

The representatives were entertained to tea by the president and members of the Huddersfield Association, to whom a hearty vote of thanks was accorded for their generous hospitality.—J. DAVIDSON, secretary.

LOCAL ASSOCIATIONS AFFILIATED TO THE YORKSHIRE FEDERATION.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

The monthly meeting of the Leeds Association was held on March 9th. The president (Mr. W. Irwin) was well supported by members.

It was decided to make representations to a member who was not giving reasonable preference to members of sub-trades who were members of the association.

Mr. J. Pickard and other members reported the proceedings of a conference with the Leeds and Yorkshire Architectural Society on the preparation of plans by builders. The architects pointed out that this was a growing practice, and one which might easily involve builders in very unpleasant and costly consequences. It was contended that several distinct advantages accrued to builders by the fact of having an architect to appeal to in the event of unreasonable requests of clients. The matter received the careful consideration of the association, and a resolution was ultimately passed expressing the opinion that the practice of builders drawing plans should not be extended or encouraged, and members were requested to give the same their earnest attention.

A committee was appointed to consider a suitable place for the meetings of the association in view of the termination of the lease of the Builders' Exchange on March 31st. A resolution was passed to pay a sum to the Yorkshire Federation on account of subscription for the current year.

The members considered the National contract form, and their representatives were desired to obtain further information on the amendments suggested.

The members also felt that it was highly desirable that some certificate should be signed by an employee when commencing service, in order to ensure that only those were engaged who were physically fit and constitutionally sound.

SHEFFIELD ASSOCIATION.

Secretary, T. Smith.

The annual dinner of the Sheffield Master Builders' Association was held at the Building Trades Exchange in Cross Burgess Street on March 17th. About 110 were present. The president, Mr. W. W. Mears, was in the chair and amongst those present were Sir John Bingham, Bart., Alderman Nixon, Councillor Cattell (chairman of the Health Committee), Councillor Fenton, Mr. F. E. P. Edwards (city architect), Mr. A. Sinclair (Scarborough), Councillor England (Barnsley), Mr. W. R. Thompson (Dewsbury, president of the Yorkshire Federation of Building Trades Employers), Mr. W. Longden, and Mr. Thomas Smith (secretary).

After the usual loyal toast, Mr. A. W Sinclair proposed "The National and Yorkshire Federations of Building Trades Employers." He rejoiced that they were now able in almost every case to settle disputes without strikes and ill-will, and the consequent heavy financial loss. They could not have had the Conciliation Board which dealt with these matters had it not been for the Federation.

Mr. W. R. THOMPSON, in response, said he looked upon the Sheffield Association as one of the premier associations in the country. They had always held a powerful influence in the deliberations of the Yorkshire Federation. If the motion, proposed by Mr. John Hodge in the House of Commons on the preceding Wednesday, had been carried, they would have been under the heel of trade unionism very much more than ever they had been in the past, because in all Government contracts they would have had to adopt trade union rates of wages and trade union rules. Referring to Mr. Herbert Gladstone's proposal to invest the Home Secretary with power to make certain rules and regulations applicable to the engineering and building trades, he said that some of the propositions were very unnecessary and very onerous. One useless rule was that all chains used in hoisting should be tested and annealed every year, and also examined by a competent person every three months, and a register kept for the inspector's examination. It did not say anything about wire ropes, so probably it was one of those proverbial rules they could drive a coach and six through. It was proposed also that painters and plumbers should be provided with water, soap, brushes, and towels.

Sir JOHN BINGHAM, replying to the toast of the "City and Trade of Sheffield," proposed by Councillor England, expressed his opinion that contract work was far and away better, and more to the interest of the working men, than municipal labour. They would know, then, what they had to get, and it was the fault of the authorities if they did not get it.

Councillor CATTELL, who also responded, considered it one of the greatest crimes a Corporation could commit to use the ratepayers' money in competition against the ratepayers themselves. He confessed with shame, he said, that the two building estates the Corporation had in their possession were losing piles of money every day, and, notwithstanding that, the housing of the working classes to-day, taken as a whole in the city, was in no better condition than it was five years ago. Whilst they had cleared out slums in the Crofts area, there were many living in parts of Sheffield to-day under conditions which were no credit to the city. If they had only learned the lesson from the Wincobank cottage exhibition that they ought to have done, they would have been in a very much better position. But, unfortunately, a few faddists on the Council would have their own way, and one of the most foolish acts the Corporation ever committed was in purchasing the houses. What was the good of purchasing them? The houses were there, the conditions were there, and the working classes were housed. He asked for the co-operation of builders in the great work of housing the working classes in a proper manner. The outskirts of Sheffield should be dealt with as a whole, and the co-operation of neighbouring local authorities should be secured. He believed that Mr. John Burns's Bill would assist them in the work.

Mr. A. J. FORSDIKE, in proposing "The Architects and Surveyors," said that it was most desirable that architects should have a practical as well as theoretical training. Only a practical training could fit an architect to undertake with confidence the very serious responsibility which now attached to his profession. He strongly deprecated the ordering of materials by architects, and in specifying the material of any particular maker, he thought that specification should read, "or other of equal value." P.c. sums were an ever-present bone of contention between them, and builders regarded this as an unfair method of giving out work. He thought they should be put into quantity form wherever possible. He was also strongly in favour of greater uniformity in making out quantities. As builders, they would like quantity surveyors pure and simple, apart from architects altogether. With regard to "squaring-up," he also thought they were entitled to have something to say. The contract contained a clause as to when the work should be completed, and it was only fair that there should also be a stipulation as to when the contractor might rely on getting paid up. Profits were exceedingly small, and it was most unfair that a contractor should be kept waiting until it was convenient for the architect to measure up a job. The ruinous prices which obtained were perhaps to some extent their own fault, as at such times employers were anxious to keep their men together. In conclusion, he wished to offer an explicit assurance that the Masters Builders' Association did not constitute a ring for raising prices, and competition between the members was on perfectly legitimate lines. They had latterly had the question of walking time much to the front, and in seeking to abolish it they were making an endeavour to cheapen building operations without in any way interfering with the wages of the men.

Councillor FENTON, in reply, referred at the outset to the question of quantities, and said that the suggestion that they should have a model set would be difficult to put into practice; but a model form of specification would, he thought, be an advantage to all concerned. With respect to the settlement of contracts, he sympathised much with builders who had difficulties of that kind. He was quite agreed that architects should not order materials, though an exception might be made in certain patented articles. With respect to the remark of one of the speakers, who cited an instance where 75 per cent. of the contract consisted of p.c. sums, and the contractor was held responsible for defects in the whole, he thought it was a case in which the 25 per cent. should be quite a separate item for which the contractor should take no responsibility in any shape or form. There were one or two matters still in negotiation between the architects and surveyors and the contractors, but he was happy to say that the relations between the two societies were never better. The Architects' Society had taken counsel's opinion, which confirmed their own impression, that workmen's insurance was a matter solely for the contractor, and could not legitimately form an item in the quantities. In p.c. sums there was a resolution of the Architects' Society, that an item should be inserted for profit and fixing; and if this was done, there was not very much to grumble about. The question of the approval of the contract agreement form was still before the R.I.B.A., who pointed out that it made no provision for the bankruptcy of the contractor, and as soon as a reply was received, it should be communicated to the Master Builders' Association. In conclusion, he pleaded for more attractive buildings, and mentioned that in his recent visit to Vienna and Buda-Pesth, he had been much struck by the extraordinary amount of money spent in beautifying their buildings, as compared with Brussels, Paris, or London.

The PRESIDENT, replying to the toast of his health, proposed by Councillor J. Dawson, remarked that forty-seven new members had been admitted during the year, and the organisation and finances had been put on a satisfactory basis.

At the annual meeting of the Sheffield Master Builders' Association, the President (Mr. T. Eshelby) presiding over a large attendance of members.

The audited balance sheet was presented by the Treasurer, and showed the finances of the Association to be in a most satisfactory position, there being a substantial addition to the capital accounts as a result of the year's working.

Mr. W. W. Mears was unanimously elected as President for the ensuing year, and in investing him with the chain and insigna of office, the retiring President reminded him that he had now attained to the highest position and the highest honour which the Association were able to confer upon him, and he wished him health and prosperity in carrying out his onerous duties. Mr. Mears then took the chair, and thanked the members warmly for the position in which they had placed him, a position which conferred obligations which it would be his constant endeavour to discharge in a manner worthy of the best traditions of the Association.

The retiring president (Mr. Eshelby) was accorded a most hearty vote of thanks for the manner in which he had presided over the deliberations of the Association during the past year, and was unanimously elected an honorary vice-president of the Association.

Mr. Wm. Longden (Messrs. Geo. Longden and Son, Ltd.) was unanimously elected vice-president for the ensuing year. For the twelve places on the committee there were fifteen nominations, and a vote by ballot resulted in the election of the following gentlemen:—Messrs. H. H. Hodkin, W. May, F. Turner, G. C. Alflat, F. Fidler, J. C. Warring, G. Roberts, J. S. Teanby, W. Lockwood, W. R. Union, J. Dawson, and G. H. Brown. The members of the Conciliation Board elected were:—Messrs. W. Longden, J. Biggin, A. J. Forsdike, J. D. Cook, A. Mastin, T. Roper, G. E. Powell, W. W. Mears, T. Eshelby, and F. Fidler. Mr. J. J. Parker, C.A., was re-elected as auditor for the ensuing year.

At the close of the annual meeting, the monthly meeting of the Association was held and presided over by Mr. W. W. Mears. The business was more or less of a routine character, and with the exception of the question of walking time raised by the operatives in relation to a job on which a member of the Association was engaged, no discussion of general interest took place.

The annual report read at the annual meeting showed a very flourishing state of affairs, and the progress was stated to be all the more noteworthy in view of the fact that in every respect the Association had achieved its record progress at a time of unprecedented depression in the building trade. The organisation of the Association had been much improved, and was now considered to be equal to that of any association in the country. During the year several contentious matters had arisen between the Association and the City Council, and on one occasion the Association had considered it necessary to protest to the President of the Local Government Board against aspersions cast on their business at a Local Government enquiry. The Corporation's housing schemes had claimed the attention of the Association, who had protested strongly against the policy of the City Council in developing building estates, at a cost which compared most unfavourably with the cost of the same work done by private contractors. At the same time, the Association pointed out that in developing their estates, the Corporation adopted methods of cheapening in regard to roads, which would amount to £20 per house, and which methods, though perfectly satisfactory, and, in fact, preferable in suburban roads, were not permitted to the private contractors. In connection with retention money on contracts, the Association had obtained, as a result of their representations, a substantial concession, and the City Council now agreed to retain only 5 per cent. on a contract for six months after completion, instead of 10 per cent. for twelve months. The City Council's new by-laws were still *sub judice*, and a deputation from the Association to discuss the objections which the Association had raised, would meet a committee of the City Council in due course.

The question of day-work prices had been discussed on several occasions, and was still being considered.

The Conciliation Board had met several times, and had satisfactorily disposed of matters brought before it. The main questions had reference to walking time, and in view of the trouble and anomaly which walking time entailed, it had been decided to abolish it.

With the Architects' Society the relations of the Association were satisfactory, but there still remained questions unsettled. The Architects' Society could not see their way to adopted the National form of contract, which they complained did not provide for the bankruptcy of the contractor, while it made provision for a like contingency on the part of the proprietor.

Socially, the Association had had a busy year, and only an improvement in trade was necessary to still consolidate further its position and usefulness.

YORK ASSOCIATION.

Secretary: J. Hague, Solicitor.

The York Conciliation Board met on Wednesday, March 24th, to try an appeal by the Operative Society of Carpenters and Joiners against a notice for alteration and addition to working rules given by the masters. Mr. Councillor Geo. Sharp (president of the Board) was in the chair, and was supported by Messrs. T. W. Magson (vice-chairman), C. Spence, R. Porteus, G. Crewcaft, Coulson, and F. W. Nicholson, representing the operatives, and by Messrs. W. E. Biscomb, W. Bellerby, C. Dent, H. Colman, and L. Wray, representing the masters.

The notice against which the appeal was made was:—To delete the words "radius ten miles," from the title page, and also from the printed heading above the numbered rules; to limit the payment of lodging and railway fares to workmen sent out from York to work outside the radius; and to fix the area in which working rules applied, at four miles from the head post office at York.

The case for the appellants was opened by the secretary to the Operatives' Society, and the case for the masters was then given.

The Board considered the case on the facts which had been placed before them, and, on a vote being taken, it was carried unanimously that the notice given by the masters for alterations and additions be upheld, and the decision of the Board was announced by the chairman.

At the conclusion of the hearing, a vote of thanks was accorded to the Lord Mayor for kindly allowing the use of the Old Council Chamber at the Guildhall.

THE NORTHERN COUNTIES FEDERATION.

Secretary: W. H. HOPE, Solicitor, Post Office Chambers, 14, Norfolk Street, Sunderland.

Minutes of a meeting of the Executive Council held in the Board Room, 14, Norfolk Street, Sunderland, on Thursday, March 4th, at 4 o'clock in the afternoon, Mr. J. Davidson (Stockton), in the chair, when fifteen representatives were present.

The minutes of the executive council meeting held at Sunderland on November 24th, 1908, were read, and the members agreeing were signed by the president as correct.

The question as to whether the National form of contract had worked satisfactorily or otherwise in the Federation's area, and whether any amendments appear to be necessary, was discussed. The secretary reported that all the local associations had been written to, asking for their observations, and read the suggested amendments received from the local associations, which were further commented upon by the representatives of the different associations. It was thought generally that contractors should not be held liable for material which was specified by the architect, as they had no voice whatever in its selection, and might have protested in voice against its use; that there should be some time fixed when the building owner should be held to have accepted delivery of the work so as to put an end to the contractor's general liability, and that provision should be made for more than a cash discount in reference to P.C. sums. Several instances were given where the architect had taken tenders for different work and material and included the price in the bill of quantities as P.C. sums, when, unless the builder himself added a sum for profit, there was neither profit nor discount for him. The opinion was that this Federation should take a strong stand and insist upon the principle of a trade discount. After considerable discussion on the question, it was resolved, on the proposition of Mr. W. J. Robertson, seconded by Mr. R. Heslop: "That a small committee be appointed, consisting of the president, Mr. J. W. White, Mr. W. T. Weir, and the secretary, to go fully into the question and decide if any amendments were necessary, and if so what, and report to the quarterly meeting of the Board of Representatives." Mr. W. T. Weir asked that Mr. S. Easten's name be substituted for his, and this request was agreed to.

The secretary reported that a small subcommittee of Durham County Council had been appointed by the Buildings Committee to consider the grievances of the Federation. At the last meeting of the Buildings Committee this report was not received, owing to pressure of the ordinary business. It was resolved: "That members tendering should stipulate that the contract would be subject to any recommendations that might be ultimately adopted by the Buildings Committee."

Bishop Auckland Union invited tenders for workhouse buildings on the basis of quantities supplied, and stipulated that contractors were to enter into an agreement to forfeit £200 in the event of their withdrawing their tender. A circular was drawn up and forwarded to every member within the Federation, drawing attention to this, and advising them to stipulate in their tenders for the embodiment of the usual terms of agreement in a proper form of contract. It is understood that the work has been withdrawn for the present.

The Federation had printed and circulated a copy of the report of the bankruptcy proceedings of a contractor in Northumberland, who attributed his bankruptcy to a form of contract he had entered into with a district council, which form the official receiver severely criticised, describing it as "confiscatory," and observing that in the case of small contractors it must, if enforced, end in the bankruptcy court. Leaders upon the case appeared in "Builders' Journal" of January 20th, under the heading of "Scandalous Contract Forms," and in the issue of February 10th under the heading of "Unfair Contracts."

A member of the Newcastle Association has been asked to sign the Hexham R.D.C. form of contract for work to be done, which contained clauses that the council's engineer should be sole arbitrator, and the bills of quantities were not guaranteed. Correspondence had passed between the R.D.C. and the Newcastle Association, and the former replied that they were not prepared to alter their form, as the time in which the work had to be carried out is limited, but that they were quite prepared to consider any suggestion made in writing as to the form to be adopted in future cases. On the proposition of Mr. J. W. White, seconded by Mr. W. Foster, it was resolved: "That this Federation draw the attention of the Hexham R.D.C. to the unfair form of contract used by them, and forward them a copy of the National form of contract and ask them to adopt it in future cases."

The question has been raised upon what basis local associations elect their representatives upon the Board of Representatives, (1) whether their return included both ordinary and honorary members, and, if so, what payment was made to the Federation in respect of honorary members. Replies showed that five associations claimed representation on both ordinary and honorary members, but made no payment for honorary members. Three associations appointed representatives upon the number of ordinary members only, and made no payment for honorary members. The rule upon representation was read, that each branch association shall be entitled to elect one representative upon the Board for every 10 members or proportion of 10 over five. Nothing is said as to the classification of honorary members. On the proposition of Mr. J. W White, seconded by Mr. W. J. Robertson it was recommended to the next quarterly meeting of the Board: "That the same proportion of local subscription received from honorary members by the local associations be paid to this Federation in respect of honorary members, as in respect of ordinary members."

To illustrate this: if the subscription is, say, 3s. 9d. per £100 of wage for ordinary members, and 21s. for honorary, then when sending 1s. 3d. per £100 to the Federation for ordinary members, one-third of the guinea for honorary members is to be forwarded.

The secretary reported that the Darlington Association had written asking for particulars as to the cost per member for that association to become affiliated with this Federation, and that the matter would be considered by that association in March. This information has been given.

The South Shields Association raised the question as to whether one subscription paid to a local association within the Federation by a member gave him the benefits of membership over the Federation's area. It was decided: "That a member shall be considered a member within the district where he pays his subcription, and be upon the telephone card belonging to the association to which he pays his subscription."

The secretary reported informally upon the form of sub-contract agreement which he had drawn up upon the instructions of the Federation for the Teesside Association, which had been approved by counsel, and was under the consideration of the Teesside Association.

The question of a model apprenticeship indenture for the whole of the Federation was discussed, but as the conditions affecting each association were different, the preparation of a common form was not approved.

On the proposition of Mr. J. W. White, seconded by Mr. W. J. Robertson, Mr. Robert Wilson, of Barnard Castle, was elected a member of the Federation.

On the proposition of the president, seconded by Mr. R. Heslop, accounts amounting to £30 2s. 6d. were passed for payment.

LOCAL ASSOCIATIONS AFFILIATED TO THE NORTHERN COUNTIES FEDERATION.

SUNDERLAND AND DISTRICT ASSOCIATION.

Secretary: W. H. Hope, Solicitor.

A meeting of the Bricklayers' Trade Committee of the Sunderland and District Association was held at 14, Norfolk Street, Sunderland, on Tuesday, February 2nd, 1909, at 8 o'clock in the evening, when representatives of the employers and operatives were present. On the proposition of Mr W. Branton, seconded by Mr. G. W. Urwin, Mr. R. J. Huntley was unanimously elected chairman. The secretary read the proposed notice of alteration to the working rules and the correspondence thereon that had passed between the association and the society, and explained that this meeting had been called, at the request of the operatives, to consider informally the proposed alterations. The chairman then gave the reasons why the association sought to have the proposed alterations. Mr. Branton said that the proposed alterations had received the careful consideration of the members of the society, and they were not prepared to accept the alterations to Clause B as suggested by the employers, but proposed that the rule should be altered to:—"From the 8th November until the 20th November (both inclusive) all men shall commence work at 7.30 and cease at 4.30 (instead of 5 p.m.), with 20 minutes for breakfast and 40 minutes for dinner, except on Saturdays, when work shall cease at 12 noon, with 20 minutes for breakfast." As to Clause C, they rejected that altogether; and with respect to Clause D they proposed that work should commence at 7 o'clock, with full meal hours. After considerable discussion upon the matter, the chairman proposed, with respect to Clause C: "That work should commence at 8 o'clock, with 20 minutes for breakfast and 30 minutes for dinner, and finish at 4.30; commence on Saturdays at 8, and finish at 12, with 20 minutes for breakfast; making a total of 42½ hours per week." The operatives agreed to place this before their society for consideration. It was proposed that in Clause B the time should read: "From November 8th until November 27th work shall commence," etc.; and in Clause C: "From November 28th until January 24th, work shall commence," etc.; and in Clause D: "From January 25th until February 20th work shall commence," etc. It was agreed that both sides consider this proposal. The proposal put forward by the employers to the Bricklayers' Society for the adoption of a new working rule dealing with the notice of alteration to the working rules was considered along with the proposal of the operatives, that instead of 14 days being added to the present time for giving notice, "That a notice shall not be given in by either side later than 14 days previous to the expiration of the time for giving such notice, unless it be a counter-notice." It was decided that this proposal be forwarded in writing to the employers. The operatives submitted a proposed alteration to working rule (5), which reads: "A lock-up shed shall be provided for the accommodation of the workmen's tools, and in which they can have their meals," and that it should be altered to read as follows:—"A lock-up shed shall be provided for the sole use of the workmen, where they can keep their tools, and in which they can have their meals." This proposal is in view of the fact that some of the sheds were used as stores for cement, etc. It was agreed that this should be placed before the employers in writing. It was mentioned by the operatives that there was a proposal on foot for an eight hours' day during the summer period. It was agreed that this should also be placed before the employers in writing.

TYNE AND BLYTH FEDERATION.
Secretary: W. H. Hope.

At a meeting of the Executive Council of the Tyne and Blyth District Building Trades Federation, held at the Hotel Metropole, Newcastle-on-Tyne, on Thursday, March 18th, Councillor S. Easten in the chair, representatives were present from Newcastle-on-Tyne, South Shields, and Blyth, North Shields being unrepresented. A letter received from the National Federation asking whether any amendment to the National form of contract was desired, along with the replies received from the local associations, was discussed, and on the proposition of Mr. W. T. Weir, seconded by the chairman, it was resolved unanimously: "That this Council is of opinion that in any consideration of the National form of contract the question of prime cost sums be thoroughly gone into."

A complaint of violation of working rule had been received from the South Shields plasterers against a South Shields member. The facts were as follows:—A plasterer was unable to finish a small job on the Saturday morning, and had to turn up first thing on Monday morning to finish it. This he failed to do, and his employer waited until after dinner-time, when, as the job would have been spoiled had it waited any longer, he put a bricklayer on to finish it. A large amount of correspondence upon the question had passed between the Federation and the society before the latter wished to have a trade committee called, but this Federation saw no sufficient reason for doing it.

A complaint of violation of the working rules against members of the Newcastle Association who are carrying out work at South Shields had been received. The operatives had not replied to the employers' letter asking for the facts of the complaint.

The organisation secretary's report was read, and, on the proposition of the chairman, seconded by Mr. W. T. Weir, it was resolved:—"That it is desirable that Mr. W. C. Creasor attend the meetings of the local associations, and get into touch with their work, and that in future all notices calling their meetings be forwarded to him, and also to the Federation secretary."

The secretary reported upon the annual dinner, which was held at Newcastle-on-Tyne on December 17th last, when 136 were present. The dinner was considered one of the most successful that have been held under the auspices of the Federation. A deficiency amounting to £13 17s. was paid out of the funds.

A communication from the South Shields Association with respect to proposed new by-laws of the Sunderland and South Shields Water Company was read; but as no action can be taken at present, it was deferred until the issue of the by-laws by the water company.

On the proposition of the chairman, seconded by Mr. Ferguson, it was resolved: "That the train fares of the employers' representatives attending the Conciliation Board meetings be paid out of the funds of the Federation."

It was resolved to hold the annual general meeting at Newcastle-on-Tyne, on Tuesday, March 30th.

Accounts amounting to £41 16s. 4d. were passed for payment.

THE MIDLAND CENTRE OF THE NATIONAL FEDERATION.

Secretary: F. W. Amphlet, 58, New Street, Birmingham.

The usual quarterly meeting of the Executive Council of the Midland Centre was held at the Imperial Hotel, Birmingham, on Thursday, April 1st. The president (Councillor H. Smith) took the chair, and representatives were present from Birmingham, Walsall, Derby, Redditch, Nottingham, Northampton, West Bromwich, Leicester, and Worcester. The president and secretary were requested to see the secretary of the North Staffordshire Master Builders' Association, with a view to reorganising that Association.

The secretary was instructed to ascertain from the local associations how far the practice of architects and others in requiring priced quantities to be supplied with tenders obtains in the Midland Centre area.

In his quarterly report, the secretary stated that complaints as to the depression in trade seemed general all over the Midlands. No serious difficulties with the operatives had been reported. Negotiations were going on in several associations in regard to notices of alterations of rules, especially as to hours of work.

Reference was made to the last half-yearly meeting of the National Federation. Mr. F. H. Fish (Nottingham) had been appointed a member of the National Council, in place of Mr. J. Wright, who, as treasurer, was now an ex-officio member.

During the quarter the secretary had met the members of the following associations:—Mansfield, Burton-on-Trent, Leicester, Redditch, Bromsgrove, West Bromwich, and Stourbridge.

The third annual conference of Midland Centre secretaries was held in Birmingham on March 25th. The president took the chair, and representatives were present from Long Eaton, Burton-on-Trent, Derby, Birmingham; Nottingham, Stourbridge, and King's Norton. Mr. A. G. White, the National secretary, gave an address, in which he stated that the essentials of success in the working of a builders' association were, in his opinion, a proper set of rules, such as the model set; an adequate basis of finance such as the model set provides; the intertrading rule and its co-relative the telephone card, in full operation; and an active carrying out of the objects and rules as indicated in the model set. Mr. White also dealt with the following matters:—The excessive proportion of specialist and p.c. sums in quantities, the waste of money due to the development of competitive tendering, the cutting of prices in slack times, and the co-operative purchase and cartage of materials such as already exists among the master masons and bricklayers of Paris. The address was a very suggestive one, and gave rise to a most interesting discussion.

The following matters were also discussed:—The intertrading rule, the "Builders' Journal," and the practice of architects in asking for priced quantities to be supplied with tenders. The secretary's report was received and ordered to be entered in the minutes.

The secretary was instructed to inform the National Secretary that the following associations approved of the existing contract form, and had no amendments to suggest:—Long Eaton, Mansfield, Burton-on-Trent, Nottingham, Bromsgrove, Leamington, Walsall, King's Norton, Leicester, and Northampton.

ROOFING SLATES.
Velinheli, Penrhyn and Westmoreland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

THE ASTON JUNCTION CO. LTD.,
Aston Road, BIRMINGHAM.
BUILDERS' MERCHANTS AND SLATING CONTRACTORS.
CEMENTS, PLASTER, LATHS, LIME, QUARRIES, TILES, CHIMNEY POTS, SANITARY GOODS, FIRE BRICKS, and BLUE BRICKS of every description.
TELEGRAMS—"CONCRETE, BIRMINGHAM."
TELEPHONE NO.—1436, CENTRAL.

THATCHING AND REED LAYING.
J. G. COWELL, SOHAM.

LAUNDRY and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE.
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

HOLLIS BROTHERS & CO.,
Timber Importers.
HULL. Jameson Chambers.
LEICESTER. Queen Street.
Wood Block Flooring.
H. B. Hardwood, Floorings, Oak, Maple, etc.
Large Stocks of Joinery Wood held under cover.
Mouldings, etc., to design.
Telephone: No. 82 CENTRAL (2 Lines.)
Telegrams: "ELF, BIRMINGHAM."

SUTTON & ASH,
41, SNOW HILL, BIRMINGHAM.
JOISTS, CHANNELS, ANGLES, TEES, RIVETTED GIRDERS, LIGHT ROOFS &c

The suggestion of the National Secretary that a note should be placed on Federation and Association note-paper to the effect that the "Builders' Journal" was the official organ of the Federation, was adopted so far as the Midland Centre is concerned, and recommended to local associations.—Fred. W. Amphlet, Secretary.

LOCAL ASSOCIATIONS AFFILIATED TO THE MIDLAND CENTRE.

BROMSGROVE AND DISTRICT ASSOCIATION.

Secretary: Sydney J. Brazier.

The third annual dinner in connection with the Bromsgrove and District Association was held at the Golden Cross Hotel, Bromsgrove, on Thursday evening, March 4th, the president (Mr. D. Edwards) being in the chair, and the vice-president (Mr. W. J. Tilt) in the vice-chair. About fifty-five gentlemen were present.

Mr. E. B. Cotton proposed the toast "Success to the Bromsgrove and District Master Builders' Association." He was very glad to know that this association was steadily increasing in numbers, and this was evidence that it was doing good work amongst the trades. He believed the association did a great deal of good in settling small disputes between masters and men, and if that conciliatory spirit could be extended to other trades, a great deal of litigation would be saved. The chairman, whose name was coupled with the toast, said that it gave him much pleasure to respond on behalf of his fellow members. If there was a young fellow present who wished to become a practical builder, he would advise him to learn the trade as a bricklayer and a joiner, and in his opinion, there was nothing to equal the joiners' shop as a means of practical education.

Mr. A. Brazier submitted "Kindred Associations." He said that the more he saw of the work of the association, the more he approved of it, for it brought them together as one of the largest bodies of employers, to protect their interests and those of their employees. Conciliation Boards were a great source of usefulness; he thought that every man who sat on those boards should go to the meetings with an open mind to do what was fair to both parties. Mr. F. W. Amphlet, whose name was coupled with this toast, said that the membership of the association was considerable for a town the size of Bromsgrove. The object of the Federation was to embrace all the builders of the country. They sought to embrace in their ranks all branches of the trade, whether engaged as large employers of labour or as smaller men, whether actually engaged in the trade or belonging to some trade allied with the trade. He was very glad that a local Conciliation Board had lately been formed, which would deal with any dispute between masters and men in the first instance, and in case of a non-settlement, the matter would be referred to the Midland Conciliation Board, and from there to the National Conciliation Board, so that it could be seen that each time the cases were brought before a different tribunal outside the influence of local prejudice. He was pleased to know that the insurance scheme adopted by the Midland Centre had been well taken up by several members, but he hoped every member would do so, as it was an entirely unrestricted policy at a very reasonable rate, and members could easily save their subscription to the association by its use. He added that every member should subscribe to "The Builders' Journal," the official organ of the Federation, which had proved a great success. Interesting news from all parts appeared regularly in its pages.

The vice-chairman, in submitted the toast of "The Architects and Surveyors," remarked that his experience was that architects always acted fairly between builder and client. Mr. Smith, whose name was coupled with the toast, said he hoped next year to have a more satisfactory report with respect to the number of buildings erected in the district.

Mr. J. Brazier proposed the health of the "President and Vice-President, who replied.

The health of "The Visitors" was proposed by Mr. A. H. Godsall, and Mr. W. Pike replied.

THE SOUTH-EASTERN CENTRE OF THE NATIONAL FEDERATION.

Secretary: T. Costigan, 31 & 32, Bedford Street, London, W.C.

LOCAL ASSOCIATIONS AFFILIATED TO THE EASTERN COUNTIES FEDERATION

NORWICH AND DISTRICT ASSOCIATION.

Secretary: J. H. Hatch.

On Thursday, March 18th, the annual meeting of the Norwich and District Master Builders' Association took place at Victoria Chambers, Bank Plain, Norwich. The president (Mr. W. Stacey Daws) occupied the chair, and was supported by the vice-chairman (Mr. B. E. Scarles) and other members of the association.

The report of the committee states that the balance-sheet for the year ending December 31st, 1908, showed for the first time in the history of the association a small deficit, due, however, to special circumstances. Three new members were elected during the year, and it is believed that several building-trade employers might be willing to join the association if members personally interested themselves in securing them. The committee are pleased to report that the rules of the plasterers and the masons have been revised, and agreed upon for a period expiring March 1st, 1911. Very important trade questions were brought to the notice of the committee during the year affecting the contract for building a new secondary school in Norwich. Considerable attention was given to such questions, and it is satisfactory to report that certain modifications were made in the terms of the contract, although not to the extent hoped for.

The members of the association again visited the beautiful grounds of Mr. Charles W. Daws, of "Riversdale," Wroxham, on July 8th, and a most enjoyable afternoon was spent, and the thanks of the association are tendered to Mr. Daws for placing his grounds at their disposal.

The committee regret that during the year the association lost three of its most prominent members by death, viz., Mr. John Hurn, Mr. G. E. Hawes, and Mr. Charles Payne. The two former had occupied the presidential chair, while Mr. Payne had for several years served as a member of the committee. The association was represented at the funeral of each, and letters of sympathy were sent to the bereaved widows and families.

The report, which was moved by the chairman, was adopted unanimously. The following officials were then elected for the ensuing year:—President, Mr. B. E. Scarles; vice-chairman, Mr. W. G. Crotch; treasurer, Mr. J. S. Smith; committee, Messrs. W. E. Bird, W. S. Daws, G. A. Hawes, J. W. King, R. A. Pank, W. T. Scarles, and J. Young; secretary, Mr. J. H. Hatch.

Several matters were discussed and disposed of.

LONDON

JAMES BROWN (LONDON), LTD.,
MAKE THE BEST
HOLLOW POROUS BRICK PARTITIONS
In 1½ in., 2½ in., 3 in. and 4 in. thicknesses.
Takes a Nail Perfectly

ESSEX WHARF, WHITECHAPEL, E.
— Telephone, 9513 Central. —

Telephone, No. 1062 HOLBORN
Contractors to H.M. Government, &c.
THE PERFECT TILE CO.,
13 & 15, Featherstone Buildings,
Holborn, LONDON, W.C.

OPAL WALL TILES. GLAZED WALL TILES.
Tessellated and other Floor Tiles.
Terrazzo and Cube Mosaics to any Design.
Fireproof Partitions. Fireproof Jointless Floors

AGENT FOR "MODERNIA" GLASS TILES

BUILDING . BOOKS . AT GREAT REDUCTIONS ! !

New Books at 25 per cent. Discount.

Books on Building, Architecture, Surveying, Estimating Technical, **all** other Subjects and for all Examinations Supplied. Sent on Approval. State Wants. Catalogues Free.

BOOKS PURCHASED.

R. P. FOYLE, 135, Charing Cross Road, London, W.C.

Send for Prices and Particulars of
FRAZZI FIREPROOF FLOORS & PARTITIONS.
Frazzi Fireproof Construction, Ltd.,
Essex Wharf, Durward Street,
WHITECHAPEL.

BIRKBECK BANK.
Established 1851.
Southampton Buildings, High Holborn, W.C.
2½ **PER CENT. INTEREST**
allowed on Deposit Accounts.
2 **PER CENT. INTEREST**
on Drawing Accounts with Cheque Book.
All general Banking Business transacted.
ALMANACK with full particulars, **POST FREE**
C. F. RAVENSCROFT, Secretary.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters, Iron Doors and Iron Fire-Escape Stairs.
Premier Ironworks, DEPTFORD, S.E.

Sprague Electric
ELEVATORS.
SPRAGUE ELEVATOR CO. LTD.,
QUEEN ANNE'S CHAMBERS,
WESTMINSTER,
LONDON, S.W.

THE MASTER BUILDERS' ASSOCIATION OF NEW SOUTH WALES.

The annual report for the year ending January 19th, 1909, of the Master Builders' Association of New South Wales opens with a jubilant note that is in refreshing contrast to the dismal records of bad trade to which we have been too long accustomed in this country. It is with a great deal of pleasure and gratification, the committee say, that they present the annual report for the year now closing, which has probably been one of the busiest years for the building trade in the history of the State, certainly the busiest of the past fifteen years. The year 1908 has been one of the best years the association has known since the early years following its incorporation.

It is now twelve months since the association occupied its new premises, and the result is a complete justification of the wisdom and foresight of those members who initiated the movement and carried it through to its successful completion. The comfort and convenience of the association rooms have been thoroughly appreciated, and the offices in the building have been all let to good tenants, the major portion of whom are connected with the building trade.

At the close of the first half-year the association was enabled to purchase the building from Builders' Exchange, Limited; the shareholders voluntarily resigning any claim to interest (for which they deserve the hearty thanks of the association), the price paid by the association was below the actual cost. At the close of the year, the first year of occupation, the committee was able to reduce the mortgage by £500.

Thirty-four new members have been added to the rolls of the association since January, 1908, a higher total than during any recent years, which, when allowance is made for the members lost by death, retirement, or other causes, means a net increase of 12½ per cent. in the membership for the twelve months. There has also been a gratifying increase of membership in the Exchange.

During the year there have been many notable additions to the architecture of Sydney in course of erection. Warehouses, shops, and office buildings have been altered, added to, and, in many cases, entirely rebuilt on a larger scale, and in more modern style. There are also several important buildings about to be erected, so that, as far as the city is concerned, the new year is starting well, and promises to be as good as its predecessor. In the suburbs, building operations have somewhat exceeded in number those of the previous year, and there appears to be no immediate prospect of any slacking off.

From enquiries made, it appears that the output of bricks from the principal brickyards during 1908 exceeded the output of 1907 by between 5 and 6 per cent. By referring to the reports of the past two or three years, it will be seen that the output has been increasing steadily since 1904.

A report received from the Metropolitan Board of Water Supply and Sewerage shows that the new buildings erected during 1908 in the city were 199 in number, of an assessed annual value of £45,385. This is a decrease in number, but an increase in value, as compared with 1907—211 buildings, annual value of £34,603. In the suburbs the number of buildings was 4,069, annual value £152,449, an increase in number, but a decrease in value, as compared with 1907—4,045 buildings, annual value £156,382. The total for the area within the jurisdiction of the Board for 1908 is 4,268 buildings, of an annual value of £197,834. This information affords a useful means of comparison of the activity in the building trade from year to year.

One of Sydney's leading daily papers recently set forth that the value of the building operations in city and suburbs during the year totalled in round figures £5,000,000. The committee are of the opinion that this estimate is too high, and regret that the various municipalities and councils have not yet followed the excellent example of the South African towns by keeping records of the number of buildings erected within their borders, the chief materials used in construction and total value of each building.

There is also one feature of the trade that must not be overlooked, viz., that, though the year has been a busy one for the master builders, it has by no means been one of unclouded prosperity. In many trades the prices of materials have been increased, while the competition has been so keen that prices obtained by builders have not increased *pro rata*, with the result that the builder is really doing more work for relatively less money. The amount of work going on has, no doubt, tempted many to start building on their own account, and some to come here from other places, so that the competition is really keener, if anything, than before.

The amount of public works let out by contract is keeping up well, and the Government promises several large and important works to be tendered for shortly, so that those members who are accustomed to Government work should be kept fairly busy during the new year. There is, however, one matter that is not so satisfactory, and that is the number of tenders opened and held over "to be reported on." It appears to the committee that the system of estimating adopted in the Government Architect's Department must be radically wrong, when, after keenest competition among tenderers, the lowest tender is much above the departmental estimate. This is evidently recognised by the department itself, for the assistance of the committee has been sought by the department to entirely recast the printed schedules which in Government works are made part of the contract for valuing extras or deductions.

The ever-recurring day labour question has again forced itself on the notice of the association. There is no doubt that this system is a direct form of State Socialism. To the average citizen the word "Socialism" seems a thing apart; recent events, however, have brought most forcibly before the public the aims of Socialists. Not only have the aims been clearly stated, but the means whereby they are to be achieved should now be familiar to all. It is for the public to judge—it is for the public to say whether the Government shall, in its methods of carrying out public works, largely endorse a system that it has to suppress in other directions. This association has spoken with no uncertain voice on the matter; years ago it pointed out the evils of the system, and every contention made by the association has been proved, beyond a doubt, to be correct. It is the intention of the association to continue in its opposition to the system, believing that it is absolutely inimical to the public welfare.

The efforts of the Government to induce the right classes of emigrants from Great Britain to make their homes in New South Wales have been crowned with a fair amount of success. Large numbers of farm hands and domestic servants have been brought here on assisted passages, and work generally found for them, while others of the farming class have been settled on the estates subdivided privately or by the Government. The advertising done by the State, and by the Immigration League, has also had the effect of attracting workmen in the building and allied trades, most of whom have applied to, or been sent to, the association and to individual members for work.

(*To be Concluded.*)

The Society of Ordained Surveyors held their eleventh annual general meeting on Monday last, in the rooms, 117, George Street, Edinburgh, when it was shown that the funds of the Society at the close of the financial year amounted to rather more than £500.

Trade and Craft.

The "O.S. Wiring System."

Messrs. Siemens Brothers and Co., Ltd., whose head office is now at Caxton House, Westminster, gave at that address, on Friday last, a demonstration of the "O.S. Wiring System," which has been devised with the object of meeting the demand for an inexpensive, efficient, and durable system. The firm has taken up a licence for the sale of "Kalkos" conduits and fittings, which are made of tinned brass or other metal, so proportioned that they follow rapidly sudden changes of atmospheric temperature. Hence no moisture collects in the conduits and fittings, and the wires do not perish. Moreover, as the system, in the course of erection, is soldered throughout, the conduit can be used as the earthed return of a concentric system, thus saving the return wire and allowing of a reduction in the size of the conduit. The "Kuhlos" and "Stannos" Metacase conductors, which, while flexible, are watertight, electrically continuous, and mechanically protected, are comparatively inexpensive. Kuhlos wires are cased with plain or tinned brass or copper, and Stannos wires are cased with tinned copper; rubber insulation being, of course, inserted in each instance. These, with the Kalkos conduits and fittings, make up the "O.S. Wiring System," which is therefore adaptable to every system of wiring, from high-class concealed work to the less expensive surface work.

The cathedral at Pienza, near Siena, is reported to be in grave danger. Some of the walls are "hanging without foundations, there being instead cavities from 10ft. to 12ft. deep, the walls holding together no one knows how." The cathedral is described as a "gem of the Renaissance," and it is hoped that the efforts to save it from destruction will be successful.

* * *

The summer meeting of the Institution of Mechanical Engineers will this year be held in Liverpool, and will begin on Monday, July 26th, concluding on Friday, July 30th, with excursions to Chester and Penmaenmawr. During the week meetings for the reading and discusion of papers will be held in the lecture hall of the Municipal Technical Schools, where, on Tuesday, July 27th, the Lord Mayor will receive the Council and members of the Institution. The Institution dinner will be held on the evening of that date, at the Exchange Station Hotel. Visits to many important works in the district have been provisionally arranged.

* * *

An important amalgamation of labourers' unions is worth noting. An agreement, which has been signed by ten societies, provides for the mutual recognition of each other's cards of membership, transfer of members from one society to another in the case of men changing their employment, mutual help in work, organisation of joint action in case of disputes, and, where disputes arise among unions, arbitration as a means of settlement. The societies which have given their adhesion to the agreement are: United Order of General Labourers of London; Workers' Union; British Labour Amalgamation; Navvies', Builders' Labourers', and General Labourers' Union; Dock, Wharf, Riverside, and General Workers' Union; Amalgamated Society of Gas Workers; Brickmakers and General Labourers; Amalgamated Association of Tramway and Vehicle Workers; National Amalgamated Union of Labour; National Union of Gas Workers and General Labourers. These unions have a membership of over 100,000. The agreement is the result of the action of the General Federation of Trade Unions, which was instrumental in the formation of the General Labourers's National Council, of which Mr. G. N. Bell was appointed secretary, and the promoters of the agreement hope that it may lead the way to complete amalgamation.

ARE YOU VISITING THE GREAT

Offices : 43, Essex Street, Strand, W.C.

H. GREVILLE MONTGOMERY, M.P. }
H. C. MONTGOMERY. } Promoters.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application.

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aber-Bargoed (Mon.).—For erection of a police station at Aber-Bargoed, for the Monmouthshire Standing Joint Committee. Mr. William Tanner, F.S.I., county surveyor, Newport:—

	£	s.	d.
D. W. Richards and Son	£2,250	0	0
R. W. Moon	2,195	0	0
D. Davies and Son, Cardiff	2,170	0	0
G. Edwards	2,136	0	0
D. W. Davies, Cardiff	2,022	0	0
A. J. Colborne, Swindon	1,987	4	10
C. H. Reed	1,950	0	0
Williams & Son, New Tredegar	1,949	0	0
J. Charles	1,946	0	0
A. S. Morgan and Co.	1,900	0	0

Rest of Newport.

Altrincham.—Accepted for the erection of a county high school for girls, Bowden Lodge, for the Committee. Messrs. Sankey and Cubbon, architects, Manchester. Quantities by Mr. W. Windsor, Manchester:—

Gerrard and Sons, Swinton, £9,850.

Bedlinog (Glamorgan).—For the erection of 40 houses. Mr. P. Vivian Jones, P.A.S.I., architect:—

	£	s.	d.
Jenkins Bros.	£5,560	0	0
John Morgan	5,520	0	0
E. P. Davies	5,510	0	0
E. T. Davies	5,080	0	0
Vodden and Lee	4,980	0	0
Horace Davies	4,760	0	0

Birmingham.—For alterations to licensed premises, "The Saracen's Head," Shirley, Birmingham, for Messrs. Grigg and Brettell, Ltd. Mr. Chas. Hook Collett, architect, Carlton House, High Street, Birmingham:—

	£
Pitts and Phillips	£1,125
T. A. Smith	1,049
Bragg Bros.	1,041
Baker and Warr	1,012
W. J. Morris*	960

*Accepted.

Basingstoke.—For alterations and additions to premises, Church Street, for the Conservative and Unionist Association. Mr. W. Roland Howell, F.R.I.B.A., architect, Reading, and 18, Percy Street, W.:—

General Building Works.

	£	s.	d.
W. H. Tigwell	£1,311	0	0
Mussellwhite and Sapp	1,297	0	0
R. Tarrant	1,281	10	0
Sutton and Co.	1,245	14	0
A. Jennings	1,195	10	0
J. Harris	1,129	0	0
Goodall and Co.*	1,118	15	0

Painting and Decorating:

	£	s.	d.
A. Jennings	£153	0	0
C. Munford	128	0	0
Mussellwhite and Sapp	125	0	0
Goodall and Co.	121	10	0
R. Tarrant	120	0	0
J. Harris	119	0	0
Sutton and Co.	113	12	0
W. H. Tigwell	102	0	0
Doman and Sons*	92	10	0

*Recommended for acceptance.

Cleckheaton (Yorks.)—For the erection of secondary and technical school, for the Urban District Council. Mr. W. H. Thorp, architect, Phœnix Chambers, South Parade, Leeds:—

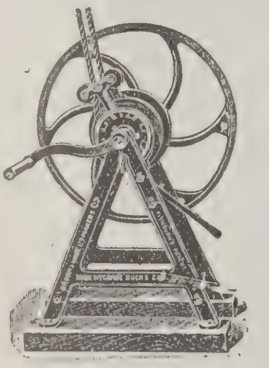
Robinson and Crowther, masons, bricklayers, and excavation work, £6,699 10s.; W. Isherwood, carpenter and joiner, £1,401 16s.; E. Nutter, plumber and glazier, £1,239; Clapham and Walker, painters, £142 18s.; G. W. Birkett, electrical work, £182 10s. All of Cleckheaton.

London, S.W.—For the erection of new iron buildings and other works at Swaffield Road, Wandsworth, S.W., for the Guardians of Wandsworth Union:—

	£	s.	d.
W. H. Hyde and Co., Norwood Junction, S.E.	£5,161	0	0
McCarthy Fitt, 118, Oxford Road, Reading	4,960	0	0
T. J. Hawkins and Co., 109, Victoria Street, S.W.	4,720	0	0
Wire-Wove Roofing Co., 108, Queen Victoria Street, E.C.	4,700	0	0
General Buildings Co., 45-6, Chandos Street, W.C.	4,647	0	0
General Iron Foundry Co., Ltd., 43, Upper Thames Street, E.C.	4,588	0	0
W. Harbrow, South Bermondsey Station, S.E.	4,570	0	0
E. Wall,* Alice Works, Summerstown, S.W.	4,106	0	0

*Accepted subject to the sanction of the Local Government Board.

(*Tenders continued on page viii.*)



Reduce your Wages by using

BROOM & WADE'S

PATENT HOIST.

This is the most Efficient Hoist on the market for hoisting barrows of bricks, concrete, &c., without Gearing.

BROOM & WADE, LTD.,

Engineers, HIGH WYCOMBE.

Telegrams— "Hoptonwood, Wirksworth."

Telephone— No. 9 Wirksworth.

THE HOPTON-WOOD STONE FIRMS, Ltd.

QUARRY OWNERS and WORKERS of WHITE, GREY and DARK HOPTON-WOOD STONE, BIRD'S EYE, BLACK and FOSSIL MARBLES.

Wirksworth, DERBYSHIRE.

London Agency Office : 134, CHEAPSIDE.

Telegrams—"Guttridge, London." Telephone—2759 Centra

PEIRSON & Co

ST DUNSTAN'S HILL

LONDON, E.C.

& WANSTEAD WORKS

Telegrams "ALLEGRETTO, LONDON." Telephone, 5951 AVENUE.

Copy of our HANDBOOK 1907 gratis

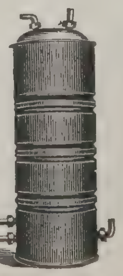
FIRE ESCAPE STAIRCASES COMPLETE - TO LOCAL AUTHORITIES REQUIREMENTS

CONSTRUCTIONAL ENGINEER

JAMES CHEW & Co.,

Brookhouse Brass and Copper Works,

BLACKBURN.

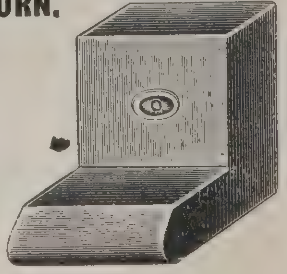


Copper Cylinders and Boilers and Pans of every description.

Sanitary Brass work.

Copper Cylinders for any pressure.

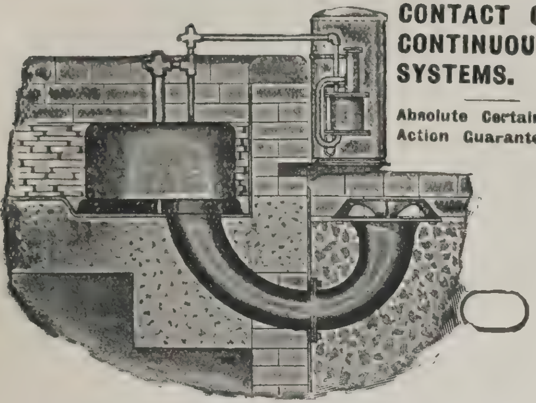
Copper Boilers for every class of range.



Galvanised Cisterns.

Roofs and Turrets covered with Copper.

BACTERIAL TREATMENT OF SEWAGE.



CONTACT OR CONTINUOUS SYSTEMS.

Absolute Certainty. Action Guaranteed.

PATENT ALTERNATING SYPHONS.

PATENT TIMING SYPHONS
(requiring no auxiliary brick chambers).

PATENT ROTARY DISTRIBUTORS
FOR TRICKLING FILTERS.

PATENT SEWER FLUSHING SYPHONS.

BURN BROTHERS,
Sanitary Engineers,
3, Blackfriars Rd., LONDON, S.E.
ALSO AT EDINBURGH.

SURVEYORS' INSTITUTION EXAMINATIONS

Complete Courses of Preparation in all Divisions and Subdivisions of these Examinations are given either in Class, by Correspondence, or in Office by

Messrs. PARRY, BLAKE & PARRY

The twelve months and two years' courses for the next two Examinations are just commencing.

These Courses have been taken by the great majority of the successful candidates in these Examinations for very many years past, including the winners of SIXTY-NINE out of the NINETY-NINE prizes awarded during the last fourteen years.

For Particulars of the Courses of Work, or for any advice with respect to the Examinations, apply to

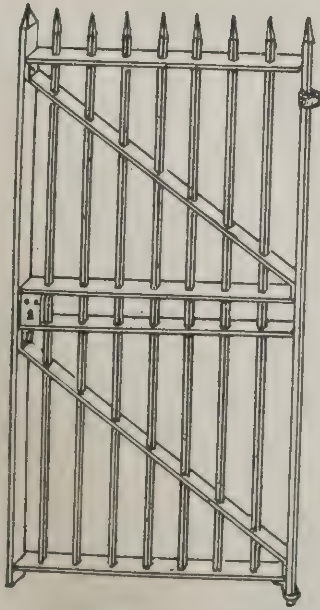
MESSRS. PARRY, BLAKE & PARRY,
82, VICTORIA STREET, WESTMINSTER.

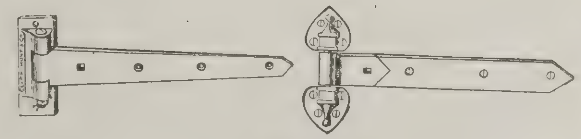
Telephone Gerrard 5680.

These Courses were established eighteen years ago, and since that time no stone has been left unturned to raise them to, and maintain them at, the highest standard of efficiency.

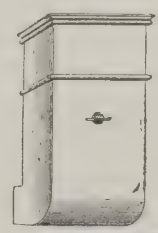
IRONWORK FOR COUNCIL SCHOOLS

GENERAL BUILDERS' IRONWORK.

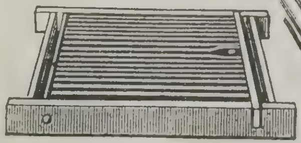


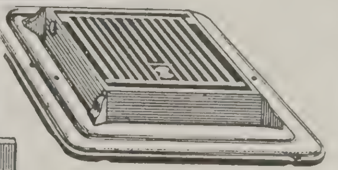


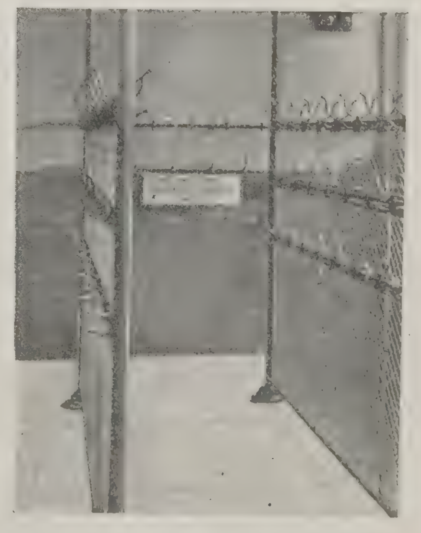
GATES . .
and . . .
RAILINGS.



TOBIN TUBES
and
GULLY
GRATES







PATENT HAT AND COAT RAILS.

CLARK, HUNT & CO., Ltd., *Middlesex Ironworks,* **Shoreditch, London.**

GENERAL CATALOGUE ON APPLICATION.

(*Tenders continued from page vi.*)

East Boldon (Durham).—For the erection of premises for Boldon Industrial Co-operative Society, Ltd. Quantities by Mr. C. W. Bell, architect, 17, Norfolk Street, Sunderland:—

Ridley and Crawford	£1,523	8	0
J. Carruthers	1,471	0	0
W. J. Robertson and Sons	1,470	0	0
S. Sheriff and Sons	1,450	0	0
W. Kennedy	1,436	9	5
J. Johnson and Sons, Ltd.	1,422	10	6
D. and J. Ranken	1,417	0	0
Clerey and Charlton	1,416	0	0
R. Harper	1,415	16	3
W. D. Allison	1,415	0	0
W. Rutherford	1,412	3	3
J. Davidson	1,407	11	2
J. Elrick	1,406	16	0
W. G. Knott	1,399	11	4
S. Fenwick and Co.	1,384	14	6
M. Hall, jun.	1,356	11	0
J. and T. Parker	1,348	5	3
J. M. Wright	1,337	10	0
J. Taylor	1,319	0	0
J. Huntley	1,317	0	0
A. Wilkinson	1,290	0	0
G. A. Black	1,273	10	11
A. Ridley	1,272	10	0
T. Lumsden,* Jarrow	1,270	0	0

*Accepted.

Enfield (Middlesex).—For the erection of houses, Ladbroke and Alberta Roads, for Mr. W. D. Cornish. Mr. F. Bethell, architect and surveyor, 23, Queen's Place, Bush Hill Park, Enfield:—

Albeta Road.

A. Burrage	£3,010	0	0
Fairhead	2,939	0	0
J. Randall	2,860	0	0
Hall Bros.	2,729	0	0
A. Monk	2,780	0	0
G. T. Lea	2,305	0	0
G. Hall*	2,070	0	0

Ladbroke Road.

Fairhead	£1,091	0	0
A. Burrage	1,085	0	0
J. Randall	990	0	0
Hall Bros.	999	8	0
A. Monk	945	0	0
G. T. Lea	860	0	0
G. Hall	765	0	0

Paving: Alberta Road—A. Burrage £35, Fairhead £10, J. Randall £20, Hall Bros. £50, A. Monk £30, G. T. Lea £6 15s., G. Hall* £12. Ladbroke Road—A. Burrage £16, Fairhead £22, J. Randall £9, Hall Bros. £25, A. Monk £15, G. T. Lea £5, G. Hall* £3.

*Accepted.

London, W.—For the erection of shop premises at No. 73, Marylebone Lane, W. Frank Chown and Sheffield, architects, 2, Princes Street, Hanover Square, W.:—

Rowe and Co., Clapham	£938
G. Parker and Son, Peckham	819
C. A. Sedgwick, Croydon	799
B. E. Nightingale,* Lambeth	796

*Accepted.

Luton.—Accepted for erection of school buildings on Beech Hill, Dunstable Road. Messrs. J. R. Brown and Sons, architects, Castle Street, Luton: W. and O. Wilkins, Watford, £8,899.

Rogate (Hants.).—Accepted for the erection of a detached house and stabling at Fyning Common, for Mr. H. C. Upton. Mr. W. R. Howell, F.R.I.B.A., architect, Reading, and 18, Percy Street, W.:—

G. A. Kemp and Son, Greatham, Hants, £3,432 15s. 6d.

Sheerness.—For the erection of higher elementary school, for the Kent Education Committee. Mr. Wilfrid H. Robinson, M.S.A., architect:—

Stephens, Bastow and Co., Bristol	£7,345	0	0
W. J. Ballard and Co., Ramsgate	7,300	0	0
J. Parren and Sons, Earith, Hunts	7,927	10	0
T. Crossley and Son, Bromley	7,140	0	0
T. W. Moss, Southend	7,000	0	0
G. Gates, and Sons, Frindsbury, Rochester	6,989	0	0
W. Wallis, Ltd., Balham	6,919	0	0
G. Browning, Canterbury	6,797	0	0
J. Podger and Sons, Bromley	6,714	0	0
L. Seager, Sittingbourne	6,696	0	0
West Bros., Rochester	6,685	0	0
T. Knight, Sidcup	6,670	0	0
Amos and Foad, Whitstable	6,595	0	0
G. E. Wallis and Sons, Maidstone	6,484	0	0
G. Baker and Sons, Strood, Kent	6,399	0	0
C. E. Skinner,* Chatham	6,393	0	0

*Recommended for acceptance.

Torquay (Devon).—For the erection of Sunday School premises, for the United Methodist Church, Chelston. Messrs. Norman G. Bridgman, A.R.I.B.A., and Walter H. Bridgman, M.S.A., architects and surveyors, Torquay and Paignton:—

J. Smerdon	£805	0	0
R. F. Yeo	792	0	0
Webber Bros.	770	0	0
W. Narracott	740	0	0
T. Vanstone	723	0	0
F. Hawkins	715	0	0
S. Hawkins	700	0	0
E. P. Bovey	684	0	0
W. Eales	670	0	0
T. Jackman	635	0	0
S. Phare	620	12	0
W. Brock*	620	0	0

*Accepted.

'Phone Holborn 1562.

The Brilliant Sign Co. 1907 Ltd.

Original Manufacturers of Brilliant Sunk Gilt Copper Window Letters.

THE LARGEST MANUFACTURERS IN THE WORLD OF

PLATE GLASS FACIAS
STALLPLATES
SWING SIGNS
GILT WOOD LETTERS
ILLUMINATED SIGNS
(of every known style)
REPOUSSÉ COPPER WORK
WINDOW LETTERS

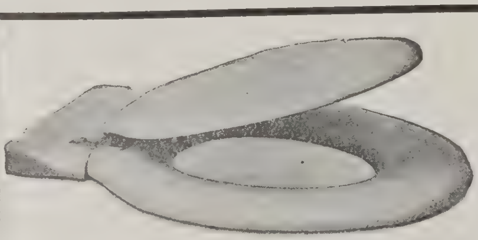
Guaranteed Best Work—Keenest Rates in the Trade.

60 pp. Illustrated Art Catalogue Free.

Wire: "Signboards, London."

38 Grays Inn Rd. London W.C.

BRILLIANT SUNK GILT COPPER PLATE GLASS FACIAS, &c.



SANITARY SEATS.

ORDERS THROUGH MERCHANTS.

EAST BROTHERS,
Lochee Cabinet Factory,
DUNDEE, SCOTLAND

THISTLE (REGD.) BRITISH MANUFACTURE

TILES. MOSAICS. FAIENCE.

CRAVEN DUNNILL & CO., LTD.,

Jackfield, S.O., Shropshire.

ENAMELS. LUSTRES. WALLS.

LIGHTNING CONDUCTORS

Supplied, Erected and Tested. Chimney Shafts Restored, &c.

J. LEWIS, 5 & 6, Great Winchester Street LONDON, E.C.

TELEPHONE No. 3053 CENTRAL.

FOLDING PARTITIONS. 2/- ft. Super.

REVOLVING SHUTTERS. 1/- ft. Super.

Hartley Bros., GORTON, MANCHESTER.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

April 8. EASTER COLTFIELD, ALVES.—Mason, carpenter, plumber, slater, plaster, and painter works of cottages to be erected at Easter Coltfield, Alves. Plans and specifications with John Witter, architect, Elgin, to whom tenders are to be sent by April 8.

April 8. MOURNEABBEY, CO. CORK.—Erection of a parochial house at Mourneabbey, for the Rev. J. Linehan, P.P. Plans, etc., at the offices of the architect, Mr. Samuel F. Hynes, F.R.I.B.A., 5, South Mall, Cork. Tenders to be sent in by April 8.

April 8. DEWSBURY.—Erection of three houses at Northfields, Dewsbury. Plans and specifications and bills of quantities of the architects up to April 8, on which day before 3 p.m., tenders are to be sent to Kirk, Sons, and Ridgway, F.R.I.B.A., architects, surveyors, and valuers, Market Place, Dewsbury.

April 8. WEST AUCKLAND.—Erection of a church hall at West Auckland. Plans and specifications, and all particulars, of F. H. Livesay, architect and surveyor, Newgate Street, Bishop Auckland, up to April 8, on which day tenders are to be delivered to the Rev. J. Roscamp, the Vicarage, St. Helen's, Auckland.

April 8. PENMAIN, NEAR BLACKWOOD, MON.—Erection of forty houses at Penmain, for the "Oakdale Building Club," Secretary, W. Phillips, Pontllanfraith. Plans and specification at the offices of the architects. Tenders by April 8 to Webb and Davies, joint architects, High Street, Blackwood, Mon.

April 8. PONTYPRIDD.—Erection of three shops, with offices over, at Mill Street, Pontypridd. Plans and specification and bills of quantities at the offices of the architects on deposit of £2 2s. Tenders, endorsed "Tender for Shops," by April 8, to A. O. Evans, Williams, and Evans, architects, Pontypridd.

April 8. WINDSOR.—Erection of a wood refreshment house on an island in the Thames, for the corporation. Plan and specification and form of tender of the borough surveyor and E. A. Stickland, Alma Road, Windsor. Tenders, endorsed "Tender for Refreshment House," by April 8, to C. Cecil Durant, clerk, 2, Park Street, Windsor.

April 8. BRISTOL.—Construction and maintenance for twelve months after completion of (1) a steel-framed building covered with galvanised corrugated iron, (2) a small brick building, (3) a small wooden office, for the docks committee. Specification, schedule, form of tender, and form of contract, and copies of contract drawings, of W. W. Squire, engineer, engineer's office, Cumberland Road, Bristol, on production of a receipt, deposit £3. Tenders, endorsed "Tender for Sack Shed, etc.," by 3 p.m., on April 8, to secretary of the docks committee, docks office, 19, Queen Square, Bristol.

April 9. NEWMACHAR (SCOTLAND).—Mason, carpenter, slater, and cement works of reconstruction of steading at Brownhills, Elrick, Newmachar. Plans and specifications with Burnett and Reid, 12, Golden Square, Aberdeen, with whom tenders are to be lodged by April 9.

April 9. HAVERFORDWEST.—Work at the old county prison, Haverfordwest, and alterations, painting, and drainage work at the police station, Milford Haven, for the Pembrokeshire C.C. Plans and specifications and all particulars upon application to Arthur H. Thomas, assistant county surveyor. Tenders to be delivered by April 9.

April 10. GILSLAND.—Erection and completion of a house at Gilsland. Plans, etc., at 3, Stanley Crescent, Gilsland. Tenders by April 10, to Thos. Routledge.

April 10. CARLISLE.—Various trades in alterations to premises in St. Cuthbert's Lane, Carlisle, for J. Martindale. Names stating trades before April 10, to J. H. Martindale, F.R.I.B.A., architect, Eaglesfield Abbey Rooms, Castle Street, Carlisle.

April 10. SUTTON-ON-SEA.—Erection of Wesleyan Church and school-rooms at Sutton-on-Sea. Particulars and bill of quantities from John Wills and Sons, architects, Victoria Chambers, Derby. Application before April 10, must be accompanied by £1 1s. deposit.

April 10. TRURO. — Completion of the tower, from plans and specifications supplied by E. Sedding, architect, for the vicar of St. Paul's Church, Truro. Plans, etc., at the Vicarage, up to April 7. Tenders by noon on April 10, to the Rev. W. G. Kerr.

April 10. ELGIN.—Mason, carpenter, slater, plumber, plaster, and painter works of additions and alterations at Murrayfield, Elgin. Plans and specifications with John Wittet, architect, Elgin, to whom tenders are to be sent by April 10.

April 10. CLWTYBONT.—Alterations to Caledffrwd, Clwtybont, for Dr. D. R. Evans. Plans and specifications, etc., at Caledffrwd or at the office of the architect. Tenders by April 10, to Ellis F. White, architect and surveyor, 17, Bridge Street, Carnarvon.

April 10. CROOKHILL.—Extension of shop premises at the Crookhill branch of Blaydon Co-operative Society. Plans and specifications at the office, Blaydon. Tenders, endorsed "Crookhill Branch," to be sent to the office, Blaydon, by the morning of April 10.

April 10. GLENCRAIG.—Brick, joiner, plumber, plaster, and slater works of proposed licensed premises, Glencraig, for John Hunter. Plans and specifications and all other information on application to James T. Scobie, architect, Dunfermline and Lochgelly. Estimates with the proprietor, 5, Douglas Street, Dunfermline, by April 10.

April 10. WELLING (KENT).—Erection of a branch public library in Bellegrove Road, Welling, for the Bexley U.D.C. Plan and sections, and specification, general conditions, and form of tender, of Thos. G. Baynes, clerk, council offices, Bexley Heath, Kent, upon deposit of £1 1s. Tenders, endorsed "Tender for Welling Public Library," to the clerk by noon on April 10.

April 10. ABERSYCHAN (WALES).—Erection of a building to be used as a drinking fountain at Leigh Road freehold land, for the U.D.C. Plans and specifications at the office of W. H. V. Bythway, clerk. Tenders, endorsed "Drinking Fountain," to be sent to the clerk by April 10.

April 10. DUNGIVEN (IRELAND).—Alteration and extension of church, for the committee of Dungiven Presbyterian Church. Principal parts of the work will consist in constructing screens and building a concrete front. Plans and specifications with Rev. Andrew Gibson, B.D., or Samuel Macartney, architect, Dungiven. Tenders with Patterson Boyle, secretary, by April 10.

April 12. MARTOCK.—Erection of a Ham stone wall at Ash Churchyard, Martock. Particulars at vicarage. Tenders to Churchwardens by April 12.

April 12. GELLIGAER.—Erection of 30 or more cottages at Gelligaer village for the Cascade Building Club. Plans and specifications may be seen at the office of Wm. Harris, architect and surveyor, Bank Chambers, Bargoed. Tenders by April 12, to the secretary, E. I. Phillips, A.A.I., High Street, Bargoed.

April 12. ABERDEEN.—Mason, carpenter, slater, and plaster work of the following buildings, for the Haddo House Estates: Parish of Tarves—1, Old Balgove (Alexr. Coutts), byres and stable; 2, Gateside (Charles Davidson), byres and shed; 3, Braiklay (and. Norrie), new steading; 4, Braiklay (Peter Bruce), new dwelling-house; 5, Boudiestone (William Allan), new dwelling-house; 6, Nether Kirkton (Robert Smith), new dwelling-house; 7, Braiklay (John Marr), new dwelling-house. Parish of Fyvie—8, Crichneyled (George Argo), kitchen wing; 9, Cloverycrook (John M'Hattie), new dwelling-house; 10, Lethenty (George M'Gregor), new dwelling-house; 11, Fetterletter (John Harper), new dwelling-house; 12, Woodhead (James Robertson), new dwelling-house; 13, Blackstocks (Mrs. Carrol), new dwelling-house. Parish of Methlick—14, Haddo (H. R. Maitland), alterations to steading; 15, Wardford (David Davidson), men's apartments; 16, Braiklay (Thomas Mennie), new dwelling-house; 17, Rosieburn (Robert Scroggie), new dwelling-house. Parish of New Deer—18, West Auchmaliddy (Mrs. and H. Gordon), additions to steading; 19, Myre of Bedlam (John Brown), new steading; 20, Auchmaliddy (J. Taylor), new steading. Parish of Ellon—21, Auchreddie (Alexr. Leslie), new dwelling-house. Plans and specification may be seen at the farms, and at the estate office. Tenders with Charles G. Smith, factor, Haddo House, by 10 a.m., on April 12.

April 13. NORTH REDDISH.—Erection of infants' school, Lewis Road, North Reddish, for the corporation of Stockport. Cheers and Smith, of Blackburn and London, architects. Name, with deposit of £3 3s., by April 13, to Arthur Lawton, secretary to education committee.

April 13. DURHAM.—Erection of a cookery centre at Esh. Alterations and improvements at Annfield Plain infants' county school. Plans, specifications, and general conditions of contract, and bills of quantities as follows:—1, Esh cookery centre, at the office of F. E. Coates, Shire Hall, Durham; 2, Annfield Plain infants' council school, at the office of W. Rushworth, Shire Hall, Durham. Tenders (endorsed with name of school), by April 13, to A. J. Dawson, clerk to the education committee, Shire Hall, Durham.

April 13. APPLEBY.—Mason's, joiner's, plumber's, painter's, plasterer's, ironfounder's, and slater's works, in the erection of a new elementary school at Appleby, for the Westmorland County Education Committee. Plans at the county education offices, Lowther House, Kendal, or at the borough surveyor's office, The Cloisters, Appleby. Bills of quantities on application to the architect, James Hartley, Swadford Chambers, Skipton, on deposit of £1. Tenders, endorsed "Appleby New School," by April 13, to Chas. J. R. Tipper, secretary to the committee, county education offices, Lowther House, Kendal.

April 13-29. LITTLE COATES, LINCOLN.—Erection of an elementary school at Little Coates, for the Lindsey County Council Education Committee. Bills of quantities and form of tender of Scorer and Gamble, architects, Bank Street Chambers, Lincoln, until April 13, on deposit of £2 2s. Tenders before 10 a.m. on April 29, to S. Maudson Grant, secretary, 286, High Street, Lincoln.

April 14. CONSETT.—Erection and completion of new P.M. hall and class rooms, Consett. Names by April 14, to J. W. F. Phillipson, architect, Murton Chambers, 8, Grainger Street, Newcastle-upon-Tyne.

April 14. ROTHERHAM.—Erection of the South Grove Upper Standard School, for the corporation. Name and address, accompanied by £2 2s. deposit, by April 14, to Spurley Hey, director of education, education offices, Rotherham.

April 14. EMBLETON (CUMBERLAND).—Erection of a villa at Embleton for A. I. Rea. Plans and specifications at the offices of W. G. Scott and Co., architects and surveyors, 2, Park Lane, Workington, to whom tenders must be sent by April 14.

April 14. DOWLAIS.—Re-roofing the "Mackworth Arms," George Street, Dowlais, for A. Buchan and Co. Drawings and specification at the office of J. Llewellin Smith, M.S.A., architect, Aberdare. Tenders, endorsed "Re-roofing 'Mackworth Arms,' Dowlais," to A. Buchan and Co., The Brewery, Rhymney, Mon., by April 14.

April 14. SWATRAGH, CO. DERRY.—Renovation and extension of St. John's Catholic Church, Swatragh, Co. Derry, for the Right Rev. Monsignor M'Gurk, P.P., V.G. Plans and specification at the Parochial House, Maghera, or at the office of the architect. Tenders by noon on April 14, to J. V. Brennan, C.E., architect, Belfast Bank Chambers, Belfast.

April 14. COMBE HAY, SOMERSET.—Erection of a new council school at Combe Hay, for the C.C. Drawings, specifications, and conditions of contract, and bills of quantities and forms of tender of W. F. Bird, Midsomer Norton. Drawings and specification at the school. Tenders, endorsed "Tender, Combe Hay New Council School," by noon on April 14, to C. H. Bothamley, county education secretary, county education office, Weston-super-Mare.

April 15. BURRY PORT (WALES).—Erection of a dwelling-house at Tabernacle Road, Burry Port. Tenders must be received by April 15. Plan and specifications from A. Wilcox, Old Harbour, Burry Port.

April 15. MILFORD HAVEN.—Erection of a shop and alterations and additions to the Grimsby Stores, on the Docks, Milford Haven. Plans and specification from C. Launcelot Blethyn, architect, Milford Haven, to whom tenders are to be delivered by noon on April 15.

April 15. MORLEY.—Various works (except plumbers) in the erection of additional premises, Prospect Mills, Morley, for J. and S. Rhodes. Plans and specifications and quantities at the Morley office of the architect on and after April 8. Tenders by 4 p.m. on April 15, to T. A. Buttery, F.I.A.S., architect, Queen Street, Morley, and 1, Basinghall Square, Leeds.

April 16. NEWCASTLE-ON-TYNE.—Alterations and extensions of premises, for the Co-operative Society, Limited, Easington Lane. Plan and specifications of L. G. Ekins, Newcastle-on-Tyne, architect, at the Society's office, 1, Store Terrace, Easington Lane, until April 14. Tenders by April 16, to the Society.

April 16. EMLEY.—Builder, joiner, slater, plumber, plasterer, and painter works at Emley Provided School, for the West Riding Education Committee. Plans, specifications with quantities on application to the West Riding architect, County Hall, Wakefield. £1 deposit in each case by separate letter to the West Riding treasurer, County Hall, Wakefield, by 10.30 a.m., on April 16, to Francis Alvey Darwin, clerk to the C.C., County Hall, Wakefield.

April 17. TRURO.—Restoration of 5 cottages, at Clarke's Buildings, Pydar Street, for T. Pascoe, Truro. Plans and specifications at 36, Pydar Street, Truro, to April 16. Tenders to T. Pascoe, 36, Pydar Street, Truro, by April 17.

April 17. DUDLEY.—Erection and completion of a new high school for girls (accommodation about 350 places) at Dudley. Applications to J. Hutchings, architect and surveyor, county education offices, Stafford, by April 17. Quantities will be supplied upon deposit of £3 3s., which should accompany the application.

April 17. BURY (LANCS.).—Erection of 50 cottages (five pairs each of five types), Bolton Road, Bury, for the corporation. Drawings and specifications and quantities, with form of tender, on application to Arthur W. Bradley, A.M.I.C.E., borough engineer and surveyor, Bank Street, Bury, on deposit of £2. Tenders, endorsed "Housing Scheme—Bolton Road," to the town clerk, Bury, by April 17.

April 17. BISHOPWEARMOUTH.—Erection of the new church, Bishopwearmouth. Plans, specification, and general conditions of contract and bills of quantities at the office of C. A. Clayton Greene, architect and surveyor, 18, Norfolk Street, Sunderland. Tenders, endorsed "St. Gabriel's Church Tender," by April 17, to H. E. Hinkley, secretary St. Gabriel's Church Building Committee, 68, Cleveland Road, Sunderland

April 19. Kirton-in-Holland.—Enlarging Kirton Holme School. Particulars of Jas. Howell, architect, Church Lane, Boston, Lincs. Tenders to be sent in by April 19.

April 19. METHLEY.—Alteration of existing building at Methley into eight cottages. Plans and specifications and bills of quantities and forms of tender on deposit, by cheque, of £1 1s., with John S. Richardson, C.E., East Parade Chambers, Leeds, to whom tenders are to be sent by noon on April 19.

April 20. WENTLOOG.—Erection of a cottage at the main sewerage outfall in the parish of St. Bride's, Wentloog, for the Western Valleys (Monmouthshire) Sewerage Board. Plans and specifications and copies of the quantities and form of tender of the engineer, Baldwin Latham, M.Inst.C.E., Parliament Mansions, Victoria Street, Westminster, S.W., and George Chatterton, M.Inst.C.E., 6, The Sanctuary, Westminster, S.W., or of the resident engineer, J. F. Jupp, A.M.I.C.E., at his office at Bassaleg, on deposit of £2 2s. Tenders, endorsed "Tender for the Erection of Cottage," by April 20, to T. S. Edwards, clerk to the board, 24, Stow Hill, Newport, Mon.

April 21. TALYWAIN (WALES).—Erection of a hall and classrooms for the trustees of the Pisgah Church, Talywain. Plans and specification of D. J. Lougher, architect, Bank Chambers, Pontypool, to whom tenders, endorsed "Hall and Classrooms," are to be sent by April 21.

April 21. WILMINGTON, HULL.—Erection of goods offices, Wilmington, Hull, for the directors of the North Eastern Railway. Plans and specification and quantities and further information upon application to William Bell, the company's architect, at York; duplicate plans also at the station master's office, Paragon Station, Hull, on and after April 14. Quantities supplied on personal application. Tenders, marked "Goods Office, Wilmington," to be sent by 9 a.m., on April 21, to R. F. Dunnell, secretary, York.

April 22. LONDON.—Erection of depot buildings, on a site at Norman Road, Greenwich, for the corporation. Drawings, specification, and conditions, forms of tender, and other particulars, from the borough engineer and surveyor's office, town hall, Greenwich Road, S.E., on deposit of £2 2s. Tenders, endorsed "Tender for depot buildings," by 4 p.m. on April 22, to Francis Robinson, town clerk, town hall, Greenwich Road, S.E. Fair wages clause.

April 28. ABERGAVENNY.—Reconstruction of the upper floors with fireproof staircases, new bath houses, etc., at the Monmouthshire Asylum. Plans and specification and bills of quantities on deposit of £5 5s. at the Abergavenny offices of the architect, E. A. Johnson, F.R.I.B.A. Tenders, endorsed "Reconstruction of upper floors, etc.," by April 28, to Charles Owen, clerk to the committee.

April 29. LONDON.—External repairs at the workhouse, Marloes Road, Kensington, for the Board of Guardians. Specification and form of tender of the clerk. Tenders by 3 p.m. on April 29, to W. R. Stephens, clerk to the guardians, guardians offices, Marloes Road, Kensington, W.

No date. CARLETON.—Various works in the erection of a dwelling-house, on the London Road, near Carleton, for J. Studholme Thompson. Drawings and specification with John Slack, architect, 18, Bank Street.

No date. SHERBURN-IN-ELMET.—Erection of a cloak room and lavatory, and internal alterations, at the Sherburn-in-Elmet Provided School. Copies of specification on application to R. J. Smith, education offices, Garforth, near Leeds.

ENGINEERING.

April 13. DUNDEE.—Construction of reinforced concrete foundations, raft, and walls of swimming bath, at West Protection Walls, Dundee, for the T.C. Plans and specifications, and schedules of quantities, etc., at the office of Jas. Thomson, city engineer, 91, Commercial Street, Dundee. Tenders with Wm. H. Blyth Martin, town clerk, City Chambers, Dundee, by April 13.

April 14. STOKE-UPON-TRENT.—Erection of water softener and hot water service at the workhouse, in accordance with plan and specification prepared by Edwards and Shaw, consulting engineers, Birmingham, for the guardians of the union. Plans and specification, with form of tender, on application to the clerk, and deposit of £3 3s. Tenders, marked "Hot Water Service," by 9 a.m. on April 14, to C. Daniel, clerk to the guardians, union offices, Stoke-on-Trent.

April 19. HAWNBY, NEAR HELMSLEY.—Construction of an earthen dam, together with cast-iron pipe outlet, bye-wash, etc., at Hawnby. Plans and specifications and quantities and forms of tender on deposit, by cheque, of £1 1s. Tenders by noon on April 19, to John S. Richardson, C.E., East Parade Chambers, Leeds.

April 22. LONDON.—Supply and erection of steam, feed, circulating water and other pipework, valves, hot-well tank, motor-driven centrifugal pumps, etc., for the Corporation of Stepney. General conditions, specification, form of tender, and drawings from Wm. C. P. Tapper, A.M.I.E.E., borough electrical engineer and manager, 27, Osborn Street, Whitechapel, E., upon receipt of a deposit of £5 5s. Additional copies on payement of £1 1s., which will not be returned. Copies of specification and drawings by appointment. Tenders, endorsed "Tender for Pipework," to the chairman of the electricity supply committee, at the abovementioned address, by noon on April 22.

April 22. PENRITH.—Supplying, laying, and jointing about 14 miles of 3in. diam. cast-iron piping, about 6 miles of 4in. diam. cast-iron piping, with valves, hydrants, etc., for the R.D.C. Plans and specifications by Joseph Graham, civil engineer, 28, Castle Street, Carlisle. Specification and bills of quantities, with form of tender, and drawings, at the office of the engineer upon deposit of £1 (cheque). Tenders, endorsed "Hesket Water Supply (Extension)," by April 12, to J. W. Smith, clerk, public offices, Penrith.

May 4. LONDON.—Supply and delivery of about 4,000 tons of steel-girder tramway-track rails and fastenings, and about 3,000 tons of slot rails and conductor tees, for the L.C.C. Track rails, etc., and slot rails and conductor tees under two separate contracts. Drawings, specifications, bills of quantities, forms of tender, and other particulars of the chief engineer of the council, Maurice Fitzmaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon deposit of £2 with the cashier of the council. Tenders to the clerk of the L.C.C., Spring Gardens, S.W., marked "Tender for Track Rails and Fastenings, L.C.C. Tramways," or "Tender for Slot Rails and Conductor Tees, L.C.C. Tramways," by 11 a.m., on May 4. Fair wages clause.

PAINTING.

April 8. EASTHAMPSTEAD, BERKS.—Painting the outside and parts of inside of the infirmary at Easthampstead, for the guardians. Specification on application to the clerk. Tenders, marked "Tender for Painting," by April 8, to C. B. Wilson, clerk to the guardians, High Street, Bracknell, Berks. Tender restricted to residents of Easthampstead.

April 14. LONDON, S.W.—Painting, distempering, general repairs, etc., at the infirmary, Fulham Road, S.W., for the guardians. Specifications of the clerk. Tenders by noon on April 14, to Thomas Worlock, clerk to the guardians, guardians' offices, Princes Row, Buckingham Palace Road, S.W.

April 14. DARTFORD, KENT.—Cleaning and painting works and repairs at Darenth Asylum, Dartford, for the Metropolitan Asylums Board. Drawing, conditions of contract, bills of quantities, specification, and form of tender, at the office of the Board, Embankment, E.C., upon deposit of £2. Tenders, by 10 a.m. on April 14.

PLUMBING & SANITARY

April 17. LINLITHGOW.—Construction of about 5 miles of 6in. to 18in. sewers and relative works, for the Bathgate District Committee. Plans, specification, and schedule at the office of Middleton, Hunter and Duff, MM.Inst.C.E., 42, Frederick Street, Edinburgh, on deposit of £1. Tenders, endorsed "Uphall and Broxburn Drainage," by April 17, to J. G. B. Henderson, district clerk, Linlithgow.

April 19. MARLOW, BUCKS.—Construction of bacterial contact filters, pump well, engine house, outfall to river, and other works for the treatment of brewery discharges at Marlow, Bucks., for Thomas Wethered and Sons, Limited. Drawings and specification and form of tender and copy of quantities at the office of William Fairley, civil engineer, 69, Victoria Street, Westminster. Tenders to be lodged with the engineer by April 19.

April 19. EASTHAM.—Construction of sewers and appurtenant works in Church Lane and Stanley Road, in the township of Eastham, for the R.D.C. The work will consist of about 430 lineal yards of stoneware pipes varying in diameter from 12in. to 6in. Drawings and specification of the engineers, Priest and Ellis, M.Inst.C.E., 13, Harrington Street, Liverpool, from whom copies of the specification, form of tender, and bill of quantities may be obtained on deposit of £1 1s. Tenders before 9 a.m. on April 19, to J. E. S. Ollive, clerk, 54, Hamilton Street, Birkenhead.

April 24. ROTHBURY.—Construction of about 4,100 lineal yards of 9in. and 6in. earthenware and cast-iron pipe sewers (including about 200 lineal yards in heading), together with manholes, inspection shafts, river crossing, detritus and settling tanks, bacteria beds, and other incidental works, for the U.D.C. Plans, sections, and specifications and bills of quantities with form of tender from C. Franklin Murphy, A.M.I.C.E., civil engineer, Newgate Street, Morpeth, on deposit of £5. Tenders, endorsed "Tenders for Sewage Works," by April 24, to George Nicholson, clerk, council offices, Rothbury, Northumberland.

May 4. LONDON.—Construction of a brick sewer, 6ft. internal diameter and 7,180ft. in length, in the Borough of Paddington, for the L.C.C. Drawings, specifications, bills of quantities, form of tender, and other particulars on application to the chief engineer, Maurice Fitzmaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon deposit of £10 with the cashier of the council. Fair wages clause. Tenders to the clerk of the L.C.C., Spring Gardens, S.W., and marked "Tender for Extension of Middle Level Sewer, No. 2, to County Boundary at Willesden," by 11 a.m. on May 4.

ROADS AND CARTAGE.

April 8. WAKEFIELD.—Construction of roads at South Kirkby Collieries, near Wakefield. Plans and specifications, and bills of quantities at the Pontefract office of Garside and Pennington, surveyors, etc. Tenders endorsed "Roads at South Kirkby," to be forwarded to the South Kirkby, Featherstone, and Hemsworth Colleries, Ltd., Ropergate House, Pontefact.

April 8. MORLEY.—Supplying the following materials during the year ending March 31, 1910, for the Corporation:—Broken granite, Yorkshire setts, flags; and kerb, sewer and drain pipes, Portland cement, pitch and creosote oil, manhole and ventilating covers, gully grates and frames, lime, sand, scavenging brooms and for refilling, stocks of machine brushes. Forms of tender and any further information on application to W. E. Putman, Assoc.M.Inst.C.E., borough engineer and surveyor, town hall, Morley. Tenders, endorsed "Tender for —," to the town clerk, F. Thackray, by April 8.

April 10. TAMWORTH.—Supplying broken granite for the year ending March 31, 1910, for the Corporation. Tenders, endorsed "Granite," by April 10, to F. E. G. Bradshaw, borough surveyor, Municipal offices, Tamworth.

April 10. LEEDS.—Paving and flagging the following streets, for the Corporation: Arthur Street, Back Nice Road, Marian Road, Back Marian Road, Marian Mount, Marian View, Marian Avenue, Cyprus Place, Back Cyprus Place, Cyprus Mount, Melville Mount, and Back Cobden Place. Also macadamising and flagging the improvement in Harrogate Road, and paving Mill Hill. Drawings of the private streets at the city engineer's office, Municipal Buildings. Forms of tender and bills of quantities and contract on application at the highways office, 155, Kirkstall Road. Tenders, endorsed "Tender for Street Work," by 10 a.m. on April 10, to town clerk's office, town hall, Leeds.

April 12. GELLIGAER.—Forming and metalling a new road at Gelligaer village for D. Williams and Co., Taff Vale Brewery, Merthyr Tydfil. Plans and specifications, with Wm. Harris, architect and surveyor, Bank Chambers, Bargoed. Bills of quantities on deposit of 10s. 6d. Tenders, endorsed "New Road," by April 12, to Frank James and Sons, solicitors, Merthyr Tydfil.

April 13. CHORLEY.—Supplying the following materials for year ending March 31, 1910, for the R.D.C.:—Broken granite and slag, rubble, chippings, setts, kerbs, tools, implements, etc. Particulars and forms of tender of Percy Whalley, highway surveyor, Gregson Lane, Hughton, near Preston. Tenders by April 13, to John Whitfield, solicitor, clerk for highway purposes, 10, High Street, Chorley.

April 14. HAMPSTEAD.—Paving with creosoted deal a portion of Constantine and Agincourt Roads, for the Corporation. Area about 2,275 square yards. Specification of O. E. Winter, A.M.I.C.E., town hall, where form of tender, with full conditions, can be obtained. Tenders by 9 a.m. on April 14, to Arthur P. Johnson, town clerk, town hall, Hampstead.

April 14. CARSHALTON. — Laying limestone tar paving, relaying and providing kerbing, and incidental works, at North Street, Waterloo Road, and The Beeches, for the U.D.C. Bills of quantities from the surveyor, Wm. Willis-Gale, A.M.I.C.E., at the Council Offices. Tenders, marked "Tar Paving," by noon on April 14, to C. P. Lovelock, clerk, district council offices, The Square, Carshalton.

April 19. YORK.—Supplying about 52,000 tons of broken stone, or about 47,000 tons of broken slag, in one year; or about 256,000 tons of broken stone, or about 232,000 tons of broken slag, to be supplied over five, or less, years, for ballasting purposes, for the North Eastern Railway. Specification and form of tender on application to W. J. Cudworth, the company's engineer, at York. Tenders to the secretary, endorsed, "Tenders for Stone Ballasting," by 9 a.m., on April 19.

April 20. ALTON.—Materials and steam rolling during the year ending March 31, 1910, for the R.D.C. Specifications and forms of tender from the surveyor, William McIntosh, Alton, Hants, on the receipt of a stamped and addressed envelope. Tenders by April 20, to A. F. M. Downie, clerk.

April 23. LONDON.—Road repairing and tar paving work, etc., at the Northern convalescent hospital, Winchmore Hill, N., for the Metropolitan Asylums Board. Drawing, conditions of contract, specification, and form of tender, at the office of the Board, Embankment, E.C., upon deposit of £1. Tenders by 10 a.m. on April 23.

April 26. WANDSWORTH.—Making-up and paving part of Acuba Street, Southfield, for the corporation. Specification and drawings, and forms of tender, at the borough engineer's office, new streets department, 56, East Hill, Wandsworth, S.W. Tenders, endorsed "Tender for Paving Acuba Street," at the Council House, East Hill, Wandsworth, S.W., by 4 p.m. on April 26. Fair wages clause.

MISCELLANEOUS.

April 8. MERTHYR TYDFIL.—Providing and fixing vestibule or inner doors and letter-box slits and plates to 88 houses, to workmen's dwellings at Penywern and Twynyrodyn, for the corporation. Particulars and forms of tender from the borough engineer. Tenders, endorsed "Workmen's Dwellings," to T. Aneuryn Rees, town clerk, by April 8.

April 17. LONDON.—Supplying furniture and fittings at the New Central Library, for the Corporation. Applicants must state similar work executed by them. Names by April 17, J. Percy Shuter, town clerk, town hall, Fulham, S.W. Of the limited number selected to compete a deposit of £2 2s. will be required.

Appointments Wanted.

The charge for Advertisements under this heading 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE architect prepares designs, perspectives, working drawings, etc., on moderate terms.—W., 6, King's Road, Kingston-on-Thames. 4918

ABLE ASSISTANCE rendered, drawings, tracings, photo-prints prepared, plans from rough sketches, specifications, etc.—Yorkshire Drawing Office, 21, Scale Lane, Hull. 4940

ARCHITECT'S Assistant (24), disengaged; Inter. R.I.B.A.; 6½ years' varied experience; working drawings, details, and perspectives, levelling; assist with quantities; shorthand and typewriting; excellent references. — S. Riches, 35, Culverden Road, Balham, S.W. 4963

ADVERTISER (20), three years with Quantity Surveyors, wishes to enter Builders' Office (preferably estimating department); excellent testimonial; very low commencing salary, with good prospects. —E., 2, St. Mary's Road, London, S.E. 4960

APPOINTMENT as Improver (19), prob. R.I.B.A., just completing three years' articles with an architect and surveyor; small salary to commence; highly recommended.—H. Cullerne, "Bridge House," Lugwardine, Hereford. 4911

ARCHITECT'S Assistant (28) seeks situation; thoroughly competent in all design and construction, including steelwork and ferro-concrete; details, specifications, quantities, surveying; eleven years' experience; manage office; permanency preferred; excellent references.—Apply, at first, Box 4954, Builders' Journal Office.

ARCHITECTURAL Draughtsman, thoroughly experienced in designing steel and ferro-concrete work, factory chimneys, retaining walls, foundations, overhead gantries, and all constructional work is open to assist or consult architects by correspondence.—Box 4927, Builders' Journal Office.

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECTS, Builders, etc., draughtsman (19), used to general work, fill up time in office; good references.—F. J. Williams, c/o F. Cundall, Architect and Surveyor, 34, Parade, Leamington Spa. 4878

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. 4888

ARCHITECT'S Assistant (27), excellent draughtsman and colourist; contract drawings, specifications, details, design, perspective, surveys, etc.; travelling studentship winner; highest refs.—Box 4902, Builders' Journal Office.

ARCHITECT'S Assistant (23) desires engagement, town or country; excellent draughtsman; good general experience; first-class references.—Box 4937, Builders' Journal Office.

ARCHITECT'S Assistant (26), desires engagement at moderate salary; good draughtsman.—Address, Young, Narellan, Old Colwyn. 4950

ARCHITECT and Surveyor's junior assistant (19), desires engagement; surveying, levelling, etc.; office routine; salary 15s.—Box 4930, Builders' Journal Office.

ARCHITECT'S Assistant (25), R.I.B.A. exam., nine years' thorough practical experience, design, working drawings, details, specifications, estimating, quantities, levelling, perspectives, etc.; sal. moderate.—Apply, Box 4900, Builders' Journal Office.

ARCHITECT'S fully qualified Assistant and Quantity Surveyor, energetic and experienced, desires immediate engagement, temporary or otherwise; competition expert; highest references; salary moderate.—W. B., 156, Warwick Road, Birmingham. 4935

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

ARCHITECT'S Junior Assistant, 5½ years' experience; disengaged; working and detail drawings, typewriting, knowledge of perspective; moderate salary.—W. L. Francis, 11, Middleton Road, Ilkley, Yorks. 4891

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, Builders' Journal Office.

ASSISTANT Surveyor seeks re-engagement; 9 years with City firm; highest testimonials; surveys, levels, estate management, etc.; shorthand if required; moderate salary.—K., 21, First Avenue, Manor Park. 4917

ASSISTANT, provincial experience, good planner and designer, domestic Renaissance, working drawings, details, surveying, competitions; excellent draughtsman, A.R.I.B.A. at one sitting; age 27.—Box No. 4928, Builders' Journal Office.

BUILDERS' Assistant desires situation; thorough knowledge plans, specifications, quantities, measuring; not afraid of work; salary not so much an object as permanent situation; 21; 5 years' experience.—Box 4839, Builders' Journal Office.

BUILDER and contractor's estimating and managing clerk seeks berth, exceptionally good all-round qualifications, acquired by sound London and provincial experience, and a reliable and successful estimator, including sewerage and kindred works; good references.—T. C., 3, Hampton Terrace, Brighton. 4933

BUILDER'S or Architect's Junior Assistant (18), good tracer, well up in prime cost, and general office work; excellent references; three years' experience. — J. W., 164, Wellesley Road, Ilford, Essex. 4833

BUILDER (38), life experience, seeks engagement as Building or Estate Clerk of Works or Builders' General Foreman; thorough knowledge of plans, details, quantities, and accounts; accurate setting out; good manager all trades.—Box 4958, Builders' Journal Office.

BUILDING Exhibition.—Young architect is prepared to assist exhibitors at the above; can reach same daily; terms low.—Box 4925, Builders' Journal Office.

BUILDING Trades' Exhibition, 1909.—Gentleman, with wide architectural experience, offers services to provincial or other exhibitors as representative at their stand; for terms apply Box 4931, Builders' Journal Office.

BUILDER'S or Architect's Assistant (25), Inter. R.I.B.A.; neat draughtsman, levelling and surveying; assist quantities, specifications, accounts, and general routine; excellent references; moderate salary for experience. — H. O'R., 80, Lavender Sweep, Clapham Common, S.W. 4973

CARPENTER and Joiner desires sit.; bench, building or estate, or other suitable capacity; experienced; good refs.; age 30.—R. H. W., 24, Thorncroft Road, Fratton, Portsmouth. 4908

CLERK of Works, shortly disengaged; first class; well up in all trades; best London references; abstainer.—R. E., 2, William Road, Guildford, Surrey. 4972

CLERK of Works, desires re-engagement, possessing first-class testimonials for ferro-concrete construction, also from Metropolitan Borough Councils, eminent architects and engineers; age 45.—Box 4922, Builders' Journal Office.

CLERK of Works, shortly disengaged, well up in all trades, best London references; abstainer.—R.E., 2, William Road, Guildford, Surrey. 4938

DRAUGHTSMAN (junior), 5 years' experience in structural engineers, good knowledge of constructional and ornamental work, details, quantities and estimating; shop experience.—M.D., 74, Bartholomew Road, London, N.W. 4884

DRAUGHTSMAN, neat, quick tracer, working drawings from rough sketches, good colourist; shorthand, typing, etc.; about 12 years' varied experience; terms moderate.—Box No. 4889, Builders' Journal Office.

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, Builders' Journal Office.

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, Builders' Journal Office.

GENTLEMAN, with office in Glasgow, splendid connection among architects, builders, etc., is open to represent one or two good firms; first-class references given.—Box 4893, Builders' Journal Office.

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W. 4951

MANCHESTER district, architect's draughtsman gives temporary assistance; experienced planner and designer; contract, detail or competition drawings.—Box 4949, Builders' Journal Office.

OUTDOOR representative, surveyor's assistant (25), disengaged, requires appointment; had experience interviewing, canvassing, knows London well; well educated, and of good address; first-class references.—Box 4952, Builders' Journal Office.

PARTNERSHIP.—Gentleman with practical knowledge, desires post in sanitary engineering business with view to partnership.—Address, Engineer, 1, Creighton Avenue, Muswell Hill, N. 4942

REINFORCED CONCRETE.—Details, drawings, calculations, and assistance generally, rendered to architects, builders, etc., by a specialist of large experience; terms moderate.—Box 4887, Builders' Journal Office.

SURVEYOR'S Assistant seeks re-engagement; 9½ years with municipal engineer; exceptionally good testimonials; well up in surveying, levelling, etc., and all work appertaining to a surveyor's or contractor's office. — Box 4971, Builders' Journal Office.

TO Builders.—Experienced, practical Builder Surveyor undertakes preparation of estimates and settlement of accounts on reasonable terms.—Box 4957, Builders' Journal Office.

TO Manufacturers.—Gentleman, with valuable connection among engineers, railway companies, and contractors, is prepared to undertake London agency for one or two good firms; offices in Westminster; highest references given. -- Box 4967, Builders' Journal Office.

WORKING shop foreman seeks re-engagement; thoroughly practical and reliable carpenter and joiner; abstainer; 7 years' ref.; age 38; wages moderate.—C. M., 16, Margett's Road, Kempston, Bedford. 4932

YOUNG Architect is prepared to assist others, at his own office or otherwise; mod. terms.—Box 4926, Builders' Journal Office.

Appointments Vacant.

A START in Life,—Vacancy for youth as pupil; moderate premium required, in a county architect's office.—Pryer, Clarence Street, Gloucester. 4947

ARCHITECT required to represent a large West End firm of contractors; must be a qualified man and be willing to call upon architects as representative.—Apply Box 4955, Builders' Journal Office.

ARTICLED Pupil—Reinforced Concrete. Required a young gentleman as articled pupil in reinforced concrete specialist's office, one with a knowledge of elementary applied mechanics, and mathematics and a taste for theory of construction and design preferred; an excellent opportunity for one willing to learn and understudy chief engineer.—Write, R. C., c/o Hastings Bros., Ltd., King's Chambers, Portugal Street, Kingsway, W.C. 4907

ARTICLED PUPIL.—Vacancy for same in old established West End firm of architects and surveyors; moderate premium; small progressive salary to suitable youth.—Box No. 4890, Builders' Journal Office.

OFFICE Boy wanted, by a builder, at West End; apply, in own handwriting, stating age, salary, and experience, to Box 4974, Builders' Journal Office.

Box 4897.—This vacancy is now filled up, and advertisers tender thanks to all applicants for letters sent. 4970

WANTED, Joiners' Foreman, for London shop of 20 men; able to estimate and work accurately to cost; used to machinery.—Box 4936, Builders' Journal Office.

JOINTLESS Floor Layers. — Wanted immediately, one or two good men, thoroughly experienced in composition floor-laying.—Apply, giving experience and wages required, Box 4946, Builders' Journal Office.

WANTED, competent reinforced concrete hands, experienced enough to act as sub-foremen.—Write, stating wages required, to D.N., Box 4944, Builders' Journal Office.

WANTED immediately, for Manchester district, competent surveyor, age about 25, for plane and angular surveying and levelling. Must have fair constructional knowledge. Address, stating age, experience, and salary required, to—"S. 31," W. H. Smith and Son, Advertising Agents, Blackfriars, Manchester. 4965

April 14, 1909.

olume 29. No. 740.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: Parliament and Town Planning; The Prince's Practical Wisdom, 313; Exit Euclid - - - - - - - - 314
Our Edition de Luxe: Building Trades Exhibition Number - - - - - - 314
American Architecture, with Especial Reference to Work at Washington. By Francis S. Swales - - - - - - - - 314
Town Planning and Open Spaces - - - 318
Notes on Competitions - - - - - 318
Construction and Wear of Roads - - - 318
Enquiries Answered: Sewage Purification Works for Small Town, 318; Rights of Adjoining Owners; Water Discoloured with Iron; Partnership Question—Style of Firm, 319; Steel Columns and Struts; Columns for Workshops - - - - - 320
New Church House, Wrexham - - - - 321
The Specification and Inspection of Timber. By J. Davies - - - - - - - - 321

FIRE-RESISTING CONSTRUCTION SECTION.

Construction of Earthquake-proof Dwellings. By Cæsar Pesenti - - - - - - - 323
The Concrete Institute - - - - - - - 324
New L.C.C. Regulations for Cinematographs - 324
Steel Frame Building Encased in Concrete - 325
The Corrosion of Steel Reinforcement in Concrete. By Ernest R. Matthews, A.M.Inst. C.E., F.R.S.E. - - - - - - - - 326
Blackler's Stores, Liverpool - - - - 327
The London County Council - - - - 328
A Concrete Town - - - - - - - 328
Hard Woods and Fire Resistance - - - 329
British Fire Prevention Committee's Official Tests - - - - - - - - 330
Reinforced Concrete Buildings in Toronto - 330
Federation News - - - - - - - 331
The Master Builders' Association of New South Wales - - - - - - - 332
Trade and Craft: Johnson's Lattice System of Reinforced Concrete - - - - - 332
Coming Events - - - - - - - 332
Tenders - - - - - - - - vi., viii.
Complete List of Contracts Open - xxiii-xxv

ILLUSTRATIONS.

Alaska-Yukon Pacific Fair, 1909; Detail of the Agricultural Building, 315; The Auditorium, 317; A Corner, 318; Mines Building and Washington State Fisheries Building, 319. See also *Centre Plate.*
New Church House, Wrexham; Prothero, Phillott, and Barnard, Architects - - - 321
Construction of Earthquake-proof Dwellings - - - - - - - 323, 324
Extensions at Hele's Schools, Exeter. Ware and Sons, Architects - - - - - - 325
Blackler's Stores, Liverpool. W. Aubrey Thomas, Architect - - - - 328, 329
High-pressure Tanks for Country Houses - 330

Parliament and Town Planning. The resuscitated Housing and Town Planning Bill was read a second time in the House of Commons on Monday, April 5th, when Mr. John Burns, in moving the second reading, said that the Bill was almost an exact reproduction of the Bill that was read a second time on May 12th last, and that stood the ordeal of twenty-three days' criticism in Grand Committee. An essential feature of the Bill, it was explained, was that it made Part 3 of the Housing of the Working Classes Act, 1890, applicable throughout the country, instead of being merely adoptive. It gave increased facilities for the acquisition of land for housing on small-holding terms. It would enable loans to be obtained from the Public Works Commissioners, up to a period of eighty years at the minimum rate of interest. It would consolidate existing Housing Acts into one measure, giving more efficient machinery at less cost. It would strengthen and simplify the present law as to closing orders and the demolition of slum dwellings. The town-planning portion of the Bill represented a new departure for this country, and Mr. Burns regretted that it had come so late. It was not fair to the poor that "streets should be put the wrong way on, or formed at the wrong angle, that they should be placed where the sun rarely got and the wind always did, and [the seeming paradox disappears on close examination] where ventilation was always denied the inhabitants." The Bill also sought power to abolish underground and cellar dwellings and to prohibit the future erection of back-to-back houses. Mr. Burns (who was at this point interrupted by Mr. Lupton, member for Sleaford, who seemed to favour back-to-back houses, and who had to be reminded that "this was a debate, and not a *conversazione*") agreed with a statement issued by the National Association for the Prevention of Consumption "that back-to-back houses and cellar tenements were unfit for habitation," and he said that eminent medical men, whose names he gave, had represented to him that the death-rate from infectious and other diseases, and lung complaints, was far higher in back-to-back houses than it was in through-ventilated houses. To those who would tell him that some of the provisions with regard to town planning were more arbitrary than they should be, he would reply, in anticipation, that he was perfectly convinced that the Government would be able to meet them in Committee. Mr. Lyttelton, who followed Mr. Burns, criticised the Bill in a very friendly spirit. He thought that the principle of town planning was quite sound. It was lamentable to think of the vast sums that had been wasted on the pulling down of expensive property which had been erected at haphazard, and which those responsible for the development of the town had been compelled to remove. Yet, subject to certain matters being adjusted satisfactorily, he did not think that owners of property need apprehend any loss. The principle of town planning would expand the market for building. Instead of landowners being almost forced to sell, as at present, small parcels of land upon which houses were packed, the tendency of the Bill would be to spread out the zones of the suburbs, and to bring much more land into profitable occupation, and thus, by creating a large area upon which buildings might be erected, to recoup the landlord for the lesser number of houses placed upon the acre. He welcomed nothing more in this Bill than the greater elasticity which it would allow in matters which had become intolerable by reason of the absurdity of rigid cast-iron by-laws; and he claimed for private experiments in planning that they had shown that commercial stability was perfectly consistent with beauty and sightliness, and local amenity generally. With certain details of the Bill, however, he was in disagreement. He thought that it gave the central authority too much power, and he conceived the possibility of that power being exercised against the local wish, and thus bringing discredit and unpopularity upon otherwise beneficent operations. He thought it unwise, also, to make the Local Government Board the appellate body in questions of demolition and the like, and he gave reasons why compensation in such cases should err (if at all) on the side of liberality, the bald value of property being often inadequate and unjust. A most serious defect in the Bill was the absence of any provision for an addition to the staff of the Local Government Board for the purpose of working the measure. The Board must set aside the false economy that might eventually cause the country to lose millions of pounds, and must equip itself sufficiently to be a real guide to the country. That is exactly the contention put forward in these pages at the time when Mr. Burns seemed disposed to deny himself what we regard as the indispensable advice and assistance of the R.I.B.A. Mr. Masterman gave certain reassurances with respect to the augmentation and equipment of the staff; and with regard to the question of preserving commons and open spaces (referred to in another column of this issue) he stated that all reasonable requirements in this respect would be met by amendments to be moved in Committee. The opposition to the Bill, led by Mr. Lane Fox, who moved the amendment, which was lost (20 for, 128 against), was based mainly on financial considerations, fears being expressed that the local authorities would not be able to cope with the burdens which the Bill imposed upon them.

The Prince's Practical Wisdom. The Prince of Wales, presiding at the first meeting of the Royal Commission for the Brussels, Rome, and Turin Exhibitions, made a speech that was not less stimulating than his famous "Wake up, England!" utterance of a few years ago. His Royal Highness, after explaining that the Brussels Exhibition, to be held next year, will represent the first occasion on which His Majesty's Government has taken part officially on an important scale in an exhibition in Belgium; and that the Rome Exhibition (in 1911) will be devoted to arts and archæology, while the Turin Exhibition of the same year will be confined to agriculture, industries, and commerce, referred to the reluctance to take part in foreign exhibitions which has been shown in the past by some of the large firms in this country, and attributed it to the fact that the trouble and cost of preparing an effective exhibit appears to be out of proportion to the direct commercial results obtained in the shape of increased orders. He reminded his hearers, however, that "the extent of the benefit resulting to any particular industry from the display of its manufactures at an exhibition cannot be measured solely by the amount of direct orders received by individual exhibitors." This reminder, stand-renters at Olympia should note, holds good for home exhibitions, where the results, although they are more immediate and direct, are still not always so prompt as to satisfy the less experienced among the exhibitors, who have yet to learn that patience and perseverance are essential to the full fruition of any form of advertising. The Prince added, "In the opinion of the recent Committee of Enquiry, the same causes which render it necessary for individual firms to spend large sums of money on advertisements in order to maintain their position in a particular trade, also render it imperative that every effort should be made at the present day to maintain and improve the reputation of British manufacturers as a whole. Experience has shown that even in the case of firms having an established reputation and world-wide connections, attempts to discontinue advertising have usually been followed by a diminution in the sales effected; and it is not unreasonable to assume that the neglect by Great Britain of one of the most important forms of national advertisement would be equally detrimental to her interests as a manufacturing country." In other words, if we are to prosper, either as individuals or as a nation, our traders must put more faith in the virtues of persistent advertising. Apropos, Sir Thomas Roe has just introduced a Bill to enable local authorities to advertise the attractions and advantages of their districts. But, in spite of high sanction, it is not likely that "the new spirit," as it is somewhat erroneously called, will infect the professional classes. With all our firm belief in advertisement, we shudder at the horrifying idea of the advertising architect. The builders' merchant, however, and the contractor, labour under no such disqualification, and the latter tradesman would find it greatly to his advantage to be much more emulous of the former in making the most of his opportunities in this direction.

Exit Euclid. It is not for nothing that the leaders of modern thought are deprecating "T-square architecture," and are dead against the slightest inclination to "argue in a circle." They are apparently in a conspiracy with the Education Department, which has not hesitated to lay its profane hands on Euclid. In a White Paper (ominous emblem!) that has just been issued by that august body, there are many revolutionary propositions —if it is still permissible to use a word that is instinctively associated with Euclid. Thus it is dogmatically laid down that "Straight needs no explanation, and all attempts at definition are waste of time." It is further alleged that "Progress in geometry does not depend on the memorising of definitions." The mathematician who is staggered by that statement will surely become a practical geometer, by the crude process of "measuring his length on the earth," as the sensational novelist used to phrase it, when he reads this: "Axioms are still less necessary, and the best course is probably never to mention them." Why that weak intrusion of "probably"? It detracts considerably from the uncompromising dogmatism that befits so draconic a pronouncement. This White Book on "The Teaching of Geometry and Graphic Algebra" is intended, we believe, for the regulation of such studies in secondary schools, whence, it may be safely assumed, are drawn most of the recruits for the noble army of architects. Those who are still at school will bless their lucky stars at escape from the soulless drudgery of burdening a reluctant memory with definitions and axioms that are sometimes worse than sterile; for there is undoubted truth in the statement that "Euclid did not write for children, but for men. To commence the subject by proving what seems to them to need no proof is a safe way to make boys think that the whole subject is artificial and unreal." This evil effect has been too often intensified by reason of the well-marked proclivity of teachers of a certain type for emphatic and fatal insistence on unessentials, while leaving their unfortunate pupils to flounder about helplessly *in ignorantio elenchi.* Any reform that shall concentrate the student's attention on principles rather than on futile paradoxes should be cordially welcomed, and will probably go far towards removing that profound distaste for mathematics which is shared by so many imaginative minds. In such cases it is not the pure reason of mathematics that is abhorrent, but the clumsy method of presentment. Oliver Goldsmith's contemptuous reference to "the low cunning of algebra" was merely a reflection on the incompetency of his teachers.

OUR EDITION DE LUXE.

Building Trades Exhibition Number.

The value of the Building Trades Exhibition to all connected with the great building industry is now so generally acknowledged, that we are spared the task of demonstrating its importance to our readers' consideration. The present fixture, which opens on Saturday next, the 17th inst., at Olympia, promises to be the most successful of all those which have been organised under the very able direction of Messrs. H. G. and H. C. Montgomery. The demand for space has been abnormal, and this great hall and its spacious annexe have been taxed to the uttermost to find room for the numerous firms who naturally desire to be represented. For weeks past the exhibition space has been reported as exhausted.

The exhibition may be regarded as one of the most interesting events in the building trade this year, and it is our desire to deal with it in a manner befitting its importance. We have arranged therefore to publish on Wednesday next, April 21st, an Edition de Luxe, printed on art paper, dealing very fully with the various features and exhibits.

Mr. H. Greville Montgomery, M.P., has kindly consented to write an article on the Exhibition, its inception, aims and growth; and we shall also publish short notes on the value of such exhibitions to architects, builders and others, by Sir Aston Webb, R.A., Mr. Mervyn Macartney, F.R.I.B.A., F.S.A., Mr. A. W. S. Cross, M.A., F.R.I.B.A., Mr. Alfred East, A.R.A., Mr. R. Frank Atkinson, F.R.I.B.A., and other well known artists. The proceedings at the opening ceremony and the luncheon will be fully reported, with sketches by our special artist. We shall also give a complete list of the visits of various bodies, arranged up to the time of opening. Among the other contents of special interest will be the revised drawings for the Royal Automobile Club's new premises, Pall Mall—Messrs. Mewès and Davis, architects—now first published.

To deal with the exhibits in a manner at once useful and informative has ever been a trouble in writing about exhibitions, and, after consultation with Mr. Ernest Newton, Mr. Mervyn Macartney, Mr. A. W. S. Cross, and other well-known architects, we have decided upon what we believe is an original and interesting arrangement for this information. The whole of the work of preparing the notices has been entrusted to Mr. Fredk. Chatterton (of Messrs. Chatterton and Couch, AA.R.I.B.A.), who has selected from data furnished by the various exhibitors some particular information about each exhibit which he believes will be of interest and use to his fellow-architects, accompanying each notice by an illustration procured in a similar manner. In the selection and preparation of these particulars and illustrations Mr. Chatterton has had an absolutely free hand. The sectionising and arrangement of them, subsequently, has been carried out by us on a system that will facilitate immediate reference, and will enable readers at the exhibition to find any exhibit with a minimum of trouble.

The Edition de Luxe will be on sale at our stand, No. 23, Row B, on Wednesday, April 21st, the fourth day of the exhibition, which remains open till May 1st.

AMERICAN ARCHITECTURE: WITH ESPECIAL REFERENCE TO WORK AT WASHINGTON.

By Francis S. Swales.

Abstract of a paper read before the Royal Institute of British Architects, Monday, March 15th, 1909.

(Concluded from page 292, No. 739.)

An Artist's Idea Achieved.

Walter's plan consists of three blocks. The central one which embodies the needs and aspirations of the formative period of the American nation; of two newer ones, a north wing and a south wing containing the two houses, each linked to the old block—the old home of both houses. It is indubitably a practical arrangement, designed to afford the best lighting to the new wings and to shut out as little as possible from the old structure; but I like to think that it is something more than all that—that there is a beautiful symbolism about it—an artist's idea achieved. That from the beginning Walter saw the two houses—the Northern States and the Southern States — widely separated, housing two different representation of the people, yet each essential to the existence and continuance of the other. That he saw in the old building the expression of a half century of common effort and common accomplishment founded upon the old plan representing the Constitution of the United States; common ideals crowned by that ornament of achievement, Unity, represented by its dome. First he planned and constructed the two wings and linked each to the old building—the two great wings of white marble were seen to predominate—to assert their importance over the old structure. He then proposed a larger dome—an emblem of a greater unity, a greater objective, one that would be powerful enough to draw the two into closer relations and harmony with each other—and to mount this emblem of a great Amendment upon the old base of the Constitution, and, finally, to bring the old structure up to the quality of the new, in appearance at least, he found it expedient to give the old substructure a coat of white paint; but he planned for the reconstruction of its front in the same enduring and beautiful materials of which the wings had been built. He saw weaknesses in the substructure that would not permit him to construct his dome of the same material as the wings, so he built it of cast-iron, and, like the amendment which I feel it represents—that which gave the slaves their freedom and the suffrage at the same time—it overhangs its substructure and is unpleasant to behold from many points of view. But so Walter deemed it expedient to leave it, and so also Lincoln left the Amendment, to succeeding generations to modify or re-construct as may be found necessary or desirable; and how is the present generation doing its duty to that trust? And to whose hands has it been especially committed? When the American Institute of Architects was formed—patterned upon this Royal Institute—Thomas Ustick Walter was selected to be its first President. He was the last representative of American architecture as it was.

The First American R.I.B.A. Royal Medallist.

The architecture of the present in the United States may be said to have begun with Richard Morris Hunt, whom this Institute honoured as the first American to which it awarded, in 1893, the royal gold medal. Hunt, when he returned to the United States in 1855, had been for ten years a student in the Ecole des Beaux Arts in the atelier of Hector Lefuel, and had worked under Lefuel and Visconti upon the construction of the extensions of the Louvre carried out during the Second Empire. He is accredited with the design of the Pavilion which faces the Rue de Rivoli, opposite the Palais Royal. Hunt was the son of a Congressman, and went directly into the office of Walter, working for him upon the Capitol for six months. He then returned to New York, where he found two or three architects endeavouring to resuscitate Gothic architecture by attempting to follow the so-called Gothic revival—or should I say Gothic postmortem?—in England. Upjohn had built Trinity Church with a great steeple, typifying religion dominating over New York—a stone exterior of pleasing design, fit to go with an old English village, and a vaulted interior—that is, "vaulted" in *plaster!* There were one or two other examples of this same sort of thing—a kind of old-world scenery, planted in little parks, amidst Greek temples serving as sub-treasury, hotel, and theatre. He set to work vigorously to change things. He started an atelier, in which he had as pupils Mr. George B. Post and Charles Gambrill, Professor Ware and Henry Van Brunt. All of these pupils turned to the brand-new "Gothic." Ware and Van Brunt practised together in Boston. Gambrill and Post, for a time, in New York. Upon the return to the United States, in 1870, of Henry Hobson Richardson, who had studied for several years in Paris, the firm of Gambrill and Richardson was formed; and in this office the late Stanford White worked as a draughtsman before he, too, went to Paris to study. Hunt had endeavoured to work in the *neo-Grec*, but seems to have found it an up-hill task, and, in spite of his best endeavours and his uncompromising contention against engineers designing architectural work, such buildings as the State War and Navy Department at Washington, the Capitol at Albany, and the Philadelphian city hall, went merrily on. Richardson returned after the war was over, and at the time that the country was being fairly inundated with Irish and Italian labourers, German mechanics, and fortune-seekers and adventurers from all parts of the world, the administrative ability which America inherited from England was taxed to its utmost to preserve order and provide elementary education. Richardson almost immediately caught the rough, vigorous spirit of the times, and his Trinity Church at Boston, Court-house and Gaol at Pittsburgh, and Chamber of Commerce at Cincinnati, attracted the attention of the public to the difference between the work of the architect and that of the engineers and builders. Everybody wanted his building, whether a court-house or church, railway station or gate lodge, in "the Romanesque rock-faced style." An architect's client, who was wealthy but without taste, was described in the architect's office as being "rich and rock-faced." Richardson's work extended all over the country—even to Washington, where he built the residence of the late Secretary of State, then Colonel, John Hay. His design for the Cathedral at Albany was perhaps his greatest work, but the building, a commonplace Gothic structure, was not erected from his design. He died in 1886, and his influence upon the architecture of the country terminated when, in 1888, in the competition for the huge Cathedral of St. John the Divine, a Renaissance design by Messrs. Carrère and Hastings was placed first by the assessor over a number of the most original, impressive, and imaginative works that had been produced in Richardson's style, including the design in course of erection, a huge *tour-de-force* by Mr. William Halsey Wood, and the masterpiece of the period, the design submitted by one Buffington and made by the late Harvey Ellis.

Photo: Topical.

ALASKA-YUKON PACIFIC FAIR, 1909. DETAIL OF THE AGRICULTURAL BUILDING.

Hunt and Avery: McKim, Meade & White.

Hunt, who found his taste for classic work opposed by the wave of Gothic and "Picturesque" popularity, had meantime compromised with the public by taking into association with himself Henry O. Avery, and together they produced the design for the William K. Vanderbilt house, Marquand house, and others in the French transitional styles of Francis I. and Louis XII. The Vanderbilt house was very successful, one of the most charming designs I have seen, either old or modern, in the style. Henry P. Kirby, of New York, produced some fine imaginative studies in this style, which he published in his book of "Compositions." A number of strong men were won over to the style of the early French Renaissance, including Ellis, who produced some interesting work in St. Louis, among other things the City Hall; Bruce Price, of New York, who designed the Chateau Frontenac, an hotel for the Canadian Pacific Railway at Quebec; and Clarence Luce, of New York; Louis Hickman, of Philadelphia; Julius Schweinfurth and George Newton, of Boston, made studies of conspicuous merit, nearly all of which were produced between the years 1888 and 1892. In 1889 several works by Messrs. Carrère and Hastings were published, which had been built at St. Augustine, Florida, in the style of the Spanish Renaissance, but highly original and beautifully adapted to American needs, composed on lines of pure design and ornamented with paintings, mosaics, and decorative sculpture. Messrs. McKim, Meade, and White produced several works in the Italian Renaissance style—the Villard houses and the Century Club; the Madison Square Garden, with the tower similar to the Giralda of Seville, and the New York "Herald" Building, by Stanford White. The publication of the early studies by Mr. McKim for the Boston Public Library, which clearly showed that it owed its inspiration to the Library of St. Genevieve, in Paris, had a very beneficent influence, and for several years was regarded by architects and the public generally as the finest example of architecture in the United States. Its extent and costliness indicated something of the demands for education of the citizens of Boston, and its conservative architecture is unquestionably only a reflection of the character of the representative people of that city.

The Columbian Exhibition

afforded an opportunity, for the first time, of bringing together the combined artistic abilities of several of the then leading architects of the country. Again, the best work owed its inspiration to French designs. From the time of this Exhibition down to the present day the history of the development of American architecture discloses a rapid march of progress. The classic influence, re-established in the public favour by the Exhibition, has been maintained, and has been accepted in one or another of its manifestations throughout the country. Numerous architectural schools have been founded; and the old ones at the Cornell, the University of Illinois, and the Massachusetts Institute of Technology, improved their courses of instruction, modelled in principle upon that of the great school of Paris. The atelier system, first attempted by Richard Hunt, was successfully inaugurated about fifteen years ago (by Mr. E. L. Masqueray, since Chief Architect of the St. Louis Exposition, who was at the time Hunt's chief assistant), and has been fostered by the Society of Beaux-Arts Architects, which has made its principal objective the education of the younger men. The Architectural League of America—a society composed of societies—whose members are the various architectural clubs, which, in several of the large cities do auxiliary work to that of the Society of Beaux-Arts Architects, especially as regards the education of those office-trained men whose circumstances prevent them from taking a regular course in one of the universities. These have given birth to and rock the cradle of the architecture of the future.

After the Exhibition.

It would be an almost Homeric catalogue that would attempt to include the works worthy of honourable mention which have been built since the time of the Columbian Exposition, and I am sure I need only to name a few of the architects who have produced them to recall to your memories views of different works of merit by each of them as among the leaders, Daniel Burnham, Charles F. McKim, George B. Post, John M. Carrère, Walter Cook, Thomas Hastings, Cass Gilbert, Whitney Warren, E. L. Masqueray, Henry Hombostel, Ernest Flagg, Louis H. Sullivan, and Peabody and Stearne, among the strong and brilliant men who have advanced the standard of design, Messrs. Lord and Hewlett, York and Sawyer, Tracy and Swartwont, Hiss and Weekes, Herts and Tallant, Hale and Rogers, Rankin and Kellogg, Trowbridge and Livingstone, Kelsey and Cret, Harold Magnigle, Dome Barber, J. H. Freedlander, H. Blackall, Arnold Brunner, John Galen Howard, J. Randolph Coolidge, Wyatt and Notting, Pell and Corbett, Richard Howland Hunt, Howells and Stokes, Shapley Ruton and Coolidge, Guy Lowell, Parker Thomas and Rice, Cope and Stewardson, Frank Miles Day, Kirby, Petit and Green, and Edgar Seeler.

Gothic Exotic.

Of those who indulge their fancy in Gothic the most successful in obtaining picturesque results (though to me Gothic is an anachronism and an exotic in America) are Messrs. Haight and Githens, Cram, Goodhue and Fergusson, Allen and Collens, Henry Vaughan, Cope and Stewardson, Field and Medary, and, though only occasionally, Julius Schweinfurth, Frederick M. Mann, Albert Kahn, Maginnis, Walsh and Sullivan, and Adin Lacey. Of the younger fraternity whose ability in monumental work has been given opportunities to make itself known are John Russell Pope, Kenneth Murchison, Janssen and Abbott, Delano and Aldrich, Carpenter and Blair, Waid and Parsons, D'Hautville and Cooper, De Galleke and Armstrong, Louis C. Spiering, Mariner and La Beaume, Galvin Keissling, Jackson and Blake, Andrew Sauer, Paul and Seymour Davis, John Van Pelt, W. W. and Hunt Bosworth.

Then there are those who, either by choice or force of circumstances, have devoted themselves to some special class of work, as residences. Of the great number of these architects I will mention only those who have done a considerable amount of excellent work, which enables me to include Wilson Eyre, Charles Platt, Oswald Hering, Lawrence and David Boyd, Little and Browne, Chapman and Frazer, W. G. Rantoul, Claude Bragdon, Alpheus Chittenden, Elmer Grey, Myron Hunt, Frank Lloyd Wright, Hugh Garden, Robert Spencer, John T. Comes, Hoppin, Koen and Huntington, Grosvenor Atterbury, Percy Griffin, James T. Kelley, Newman and Harris, Charles Barton Keen, Meade and Garfield, and George B. Page. The names stand for thousands of well-designed buildings erected during the past decade or two, and there are others.

[Mr. Swales completed his paper with the description of a visit to Washington in the company of friends, to whom the opinions expressed are to be attributed, as they are probably expressed with less reticence than Mr. Swales would himself observe.]

Before Walter died, he made a plan for extending the east front of the Capitol by arranging offices along it, and left it to his heirs to go to Congress for the money when the country couldn't stand the appearance of the old front any longer. Congress has now built for itself two fine office buildings, two white marble edifices with coupled Doric colonnades as we turn west along North B Street. The library has blocked up the view down Pennsylvania Avenue to the south-east, and it occupies but one-half of the last side of the square. At the other side they will probably soon build the Supreme Court Buildings. Several more buildings are needed, and the whole square is to be enclosed by public buildings in the not very distant future. The front of the Capitol is going to be rebuilt in marble, without any "practical" subterfuge, and because at present it is unworthy to be part of a building that stands for the people of the United States. Walter made a plan to improve it, but the addition of offices would have been unfortunate for the effect. Carrère and Hastings have made some changes to his scheme that will make it just as it should be.

We drive now to the House Office building, and inspect the beautiful interiors. The design of these interiors seems to have commenced where the most refined and scholarly work of the best period of the style of Louis Seize left off; we see the rotunda and staircase hall.

The Library of Congress

goes well with the feeling that follows a good meal accompanied by good-fellowship. It was commenced by a couple of Germans, Smithmeyer and Peltz, but finished by three good Americans—General Casey, his son Edward Casey, and Bernard Green. But young Casey was the real architect who made it worth looking at; it was not his fault that the dome on the library, when seen from Pennsylvania Avenue, looks as though it were on one wing of the Capitol. He did well with the interiors; and the plan which is by Smithmeyer and Pelz, is fairly good.

The Mall and the Avenue.

The next thing to see is the Mall. The Avenue, in accordance with the advice of the Senate Commission, is to be cut through the Mall from the middle of the west front of the Capitol straight to the Washington Monument, and beyond it all the way to the river—or almost; that is to say, to a round point near the river where the monument to Lincoln is to be built, and from which the approach to the bridge over to Arlington is to commence. Two of the big buildings are almost built; the pair in South B. Street are only part of the Agricultural Department. They remind us slightly of those in the Place de la Concorde, Paris. The new National Museum, which is not as big nor has it as fine a collection as the British Museum, has not much to learn from it in some other respects.

We have driven past

The Washington Monument,

and when the base proposed by the Senate Commission is added and the trees are planted in a regular way, it will look well, because the small work around the base and the road leading up to it will make it look its 555ft. in height, and it will be more effective and look like a monument.

This building which is going up on the corner to the left is

The New Pan-American Peace Palace

by Kelsey and Cret, of Philadelphia, and just beyond is the club building for the Society which calls itself the Daughters of the American Revolution.

The Corcoran Art Gallery has a fine interior.

The "Limit" of Ugliness.

As we pass between the President's house and the Treasury we ask a friend accompanying us, "Why didn't you drive straight to Pennsylvania Avenue instead of coming round to this side?" "Because," replies the representative from Montana, "that State, War, and Navy building has got on my nerves: for an absolutely ugly building that's the limit!" But this building is about Mullet's worst work.

Besides a number of good commercial and private buildings, there are the Carnegie Library, the War College, by McKim, Meade and White. The Naval Academy at Annapolis is worth the journey. The only cathedral in America that would do for Washington is the new one that Masqueray is building in St. Paul, Minnesota.

"I thought," remarked our English friend, "there was a handsome cathedral being built from designs by Bodley. Do you know about that?" "Do I know about it? That ——" he is about to say something, but cannot, then changes his mind and says softly: "I have seen the design and I suppose it is really a fine thing, though I think Gothic is an anachronism, and in Washington an exotic. A Gothic cathedral in Washington is as bizarre as a forty-storey office building would be in Oxford."

"But what other buildings remain to be built? I should think nearly all have been either completed or commenced," says our guest.

"Well, the Treasury Department is overcrowded, it would be glad to get rid of the office of the Supervising Architect, and the Supervising Architect would probably be glad to be rid of the Treasury Department. There is that Council of Fine Arts recently appointed by President Roosevelt which must be made permanent and given a home somewhere—possibly in that corner opposite the site suggested for the proposed Supreme Court House. It will not be long before the Government will find it expedient to create a separate department to take care of its works—possibly two departments—one a department of Works, and the Fine Arts, which would control everything of an architectural character, controlling the buildings, bridges, parks, and all their details, furnishings, equipment, and decorations, which would relieve the Treasury Department of a heavy load; and another which might be a Department of Engineering Works to relieve the War and Navy departments of a similar strain, by taking over all such works as dams, sea walls, harbours, levees, forts, earthwork and canals. Before long, even with these changes, one of the three departments in the State, War, and Navy building, will have to find new quarters, and even for the two that will be left it will remain inconvenient and unsatisfactory—and that means unprofitable."

"You don't suggest," we exclaim, "that the State, War, and Navy building, will ever be materially altered, do you?"

"We shall see," he replies. "You would have said the same thing about the New York Post Office five years ago, but it has been proved that the country can save money by building a new one. By the way, I haven't answered your question about the Mall—as to whether everybody is agreed—as a matter of fact the Department of Agriculture did try to interfere with the scheme, but Senator Newlands stopped the game by placing a 'rider' on the appropriation, so that the Department could only get the money for the building by setting it up in a given position. But I believe the time will come, and I think within the next four years, when all will be agreed that the plan of the Senate Commission must not be altered—why do I think that? Because nearly every new M.C. is a college man, and nearly every college of importance is planned on a comprehensive scheme. See the new plan for the University of Minnesota, by Gilbert, and those for the Western University of Pennsylvania by Hornbostel; then there are Cornell, Pennsylvania, Columbia, the University of the City of New York, Harvard, Yale, Princetown, Washington in St. Louis, the University of California, to mention only a few which have been, or are in the process of being, built to a prearranged plan. They cannot help but have some influence."

"So you really think my ideal town is a possibility?" asks Mr. Lanchester.

"I am sure it is a possibility," responds O'Grady, "but whether or not it is a probability depends more or less upon your own professional fraternity—you know the sayings as to the enemies of one's own household—and about households divided against themselves. I can remember the days when every architect who came to see me not only

Photo: Topical.

ALASKA-YUKON PACIFIC FAIR, 1909. THE AUDITORIUM. ONE OF THE PERMANENT BUILDINGS.

'knocked' the bad work of the supervising architect under the old *régime*, but also wanted his job. It's different nowadays, they all pull together in public and have their rows out between themselves; of course there are still among them the 'yellow dogs' who bark at everything but their own bone, but those that are any good belong to one or another of the societies—sometimes to several, and they are all pals. They come here organised like an army, there are three or four strong societies, but you cannot put one up against another, for they pull together; and at times—let me give you the tip—we don't know it, but we suspect that they vote together. How do you stand as regards your leaders—or are you the leader yourself—or is your condition as ours was here a few years back, when every man was the sole leader of an army of one? Or, are you in England suffering from the old complaint that used to be the rule here, in the days when the American Institute of Architects had only just come into existence, of not knowing who the leaders of your profession are until they are beyond the age when they desire active leadership?"

"How do you account for this new condition of things among the architects?" asks our guest by way of reply.

"Search me," says the congressman. "How do you account for it?" turning to ourselves.

We reply: To several things; including, first the system of education which enables America to know who their strong men are while they are still young—a system that is competitive and the results of the competitions made public. It is the French system—that of the Ecole des Beaux-Arts—where each student knows exactly the standing and record of every other student as well as his own in every subject. The entrance examinations are to the schools—not to the Institute. Before a student has spent much time or money he knows whether it is likely to be worth his while to do so. Second, to fellowship which arises out of friendly association with one another in the architectural clubs, the universities, and the ateliers in Paris. To the influence upon a large personal following of young men by such strong men as Messrs. Charles McKim, John M. Carrere, George B. Post, Walter Cook, Cass Gilbert, and E. L. Masqueray; and of the college professors, Wm. R. Ware, A. D. F. Hamlin, D. Despradelles, Warren Powers Laird, Frederick M. Mann, Emil Lorch, Paul Cret, and others; but more particularly to the generous impulse of one of the present leaders who had a great opportunity to show his mettle and proved equal to the occasion. This was the man who might have designed in his own offices all of the buildings at the Columbian Exposition, but chose rather to recommend to the Exhibition Company to give out five of the largest buildings to his ablest contemporaries in his own town of Chicago, and five others to men practising in different parts of the country, whose loyalty to these co-workers was never found wanting, and whose integrity and ability—artistic, organising, and executive—proved him to be the fittest to lead, though he conceded himself that leadership to Richard Morris Hunt during his lifetime—Mr. Daniel Hudson Burham, of Chicago, Chairman of the Senate Commission, which recommended to the Senate that the plan of the great L'Enfant should be adhered to.

Discussion.

Mr. John W. Simpson proposed a hearty vote of thanks to Mr. Swales, and said he wished that someone more familiar than he with American architecture had been called upon to perform that duty. Mr. Swales was well qualified to read such a paper, being one of the architects connected with the St. Louis Exhibition, and also an old pupil of Pascal in Paris. It was not his (the speaker's) business to discuss or to criticise the paper. The views Mr. Swales had shown them were quite clearly representative of work in America, and he had nothing to do but to express his appreciation of the general excellence of its character. It was usual, he believed, to draw a moral, and it seemed to him that the only moral to be drawn was the wonderful influence of French work manifested in buildings designed by architects who had received part of their education in France. The great progress made since Hunt came from that country was really remarkable. The Americans were a nation pre-eminently practical; a nation used to dealing with vast monuments not merely as monuments, but as works of actual necessity. He had been occasioned some surprise by the statement of Mr. Swales, that when it was found that the station of the Pennsylvania and the Baltimore and Ohio Railways interfered with the construction of a certain avenue, and the authorities were requested to remove the obstructions, they demurred not at all, but speedily commenced to make the required alteration. He believed that a great improvement would be made if the Charing Cross railway station and the bridge across the foot of Ludgate Hill were demolished, and the respective termini reconstructed on the opposite side of the river to designs by Mr. Ernest George.

Mr. John Slater, in seconding the vote of thanks, observed that it almost turned them green with envy to hear of a young architect going to America and submitting a large scheme, such as the new Admiralty buildings, and getting it accepted immediately. Mr. Ernest George commented upon the common sense of Americans in pulling down certain buildings to make room for others of a more valuable type. He would like to see similar reform instituted in London.

Mr. Swales briefly replied.

TOWN PLANNING AND OPEN SPACES.

The appointment of the first University Professor of Civic Design and Town Planning has naturally invested the subject with fresh and vitalising interest. The somewhat airy abstraction of the publicist and the theorist will now crystallise in the more definite prolusions of the professor. The establishment of the Chair in the University of Liverpool, and the happy choice of an ideal occupant, are of good augury for the movement, and will go very far indeed towards confirming the public confidence in it, and thus towards strengthening the favourable mass of opinion that already seems to give assurance that the Town Planning Bill will not be abandoned, or at least that its best principles will become operative. As to the main motive and purpose of that Bill there is but little opposition; but some of its details are open to strong objection. In particular there is vehement protest against the clauses that give power to local authorities to enclose commons or open spaces, or to appropriate them for building purposes without the sanction of Parliament in each particular case. The Commons and Footpaths Preservation Society, the Metropolitan Public Gardens Association, the National Trust, and the Kyrle Society, are taking united action in preferring the reasonable request that, should it in any case be found desirable to include any public land—park, common, village green, or other similar open space—in a town improvement scheme, under the prospective new Act, an equivalent and a suitable area must be provided in compensation, and that in every such case the express sanction of Parliament must be obtained. No doubt it will be found that open spaces are sometimes awkwardly situated in relation to prospective town planning, so that their obliteration might be necessary to a good scheme; but what is chiefly feared by the jealous lovers of open spaces in that parsimonious local authorities might be tempted by relative cheapness of public as compared with private lands, to prefer to build on the former rather than on the latter. This temptation would be removed if the authority were compelled to make good the public loss. But here the rather nice question arises: How will "an equivalent and a suitable area" be calculated? Any orally worthy town plan, devised upon enlightened lines, will, as a matter of course, include due provision for parks and open spaces; which, however, will be required rather as promenades and playing-fields than as "lungs." The town-planning of the future will include properly organic breathing apparatus, and its parks and open spaces will be beauty spots and recreation grounds.

Photo: Topical

A CORNER OF THE ALASKA-YUKON PACIFIC FAIR, 1909.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading. Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second, and third respectively. Assessor: Mervyn E. Macartney, F.R.I.B.A., F.S.A.
July 31.	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	BOURNEMOUTH BRANCH PUBLIC LIBRARY. Architects practising in the County Borough of Bournemouth are invited to submit designs for a new Branch Library at Boscombe. Particulars from Charles Riddle, Borough Librarian, Central Library, Bournemouth.
No date.	WALLASEY U. D. COUNCIL. CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

Town Hall Extensions, Stoke-on-Trent.

The Town Council has decided to spend £20,000 on extensions to the present town hall, for the provision of a hall seating 3,500 to 4,000 people, a new courtroom, and other offices. The building committee will request the President of the R.I.B.A. to nominate an assessor to draw up the conditions and adjudicate. Prizes are to be given for the three best designs.

CONSTRUCTION AND WEAR OF ROADS.

At the ordinary meeting of the Institution of Civil Engineers, on Tuesday, March 23rd, a paper on the "Construction and Wear of Roads" was read by Mr. H. A. R. Mallock, F.R.S., who considered the subject from a theoretical point of view with regard to the foundation of the road, its surface, and the character of the traffic. The proper function of the foundation, he said, is to form a buffer between the natural ground and the surface of the road, and within the thickness of the foundation there should be a gradual change in the properties of the material employed from those of the natural ground to that required at the road surface; and, further, the proper thickness to be given to the foundation should depend on the elastic limits and breaking strain of the ground and foundation material. It is suggested that roads with a hollow cross-section, drained by a central gutter covered by a continuous grating, would be worthy of trial, as tending to prevent the accumulation of mud and water close to the footways, and as giving the greatest facilities for keeping the whole of the roadway clean. The formation of dust and mud was imputed almost entirely to the grinding and crushing action of iron tires and iron horseshoes. The diffusion of dust was shown to be chiefly dependant on speed, and on the width of the tires, and in a minor degree on the form and ground clearance of the vehicles. With soft tires the wear of any good road is extremely small, and with pneumatic tires still less, but as long as iron tires and iron-shod horses are used for traction, the best means of preserving a clean and unbroken road surface is to be found either in the applications of tar (many of which have already been made with considerable success), or in some other method which will give the same large limits of elasticity and rupture to the upper layer of road material.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

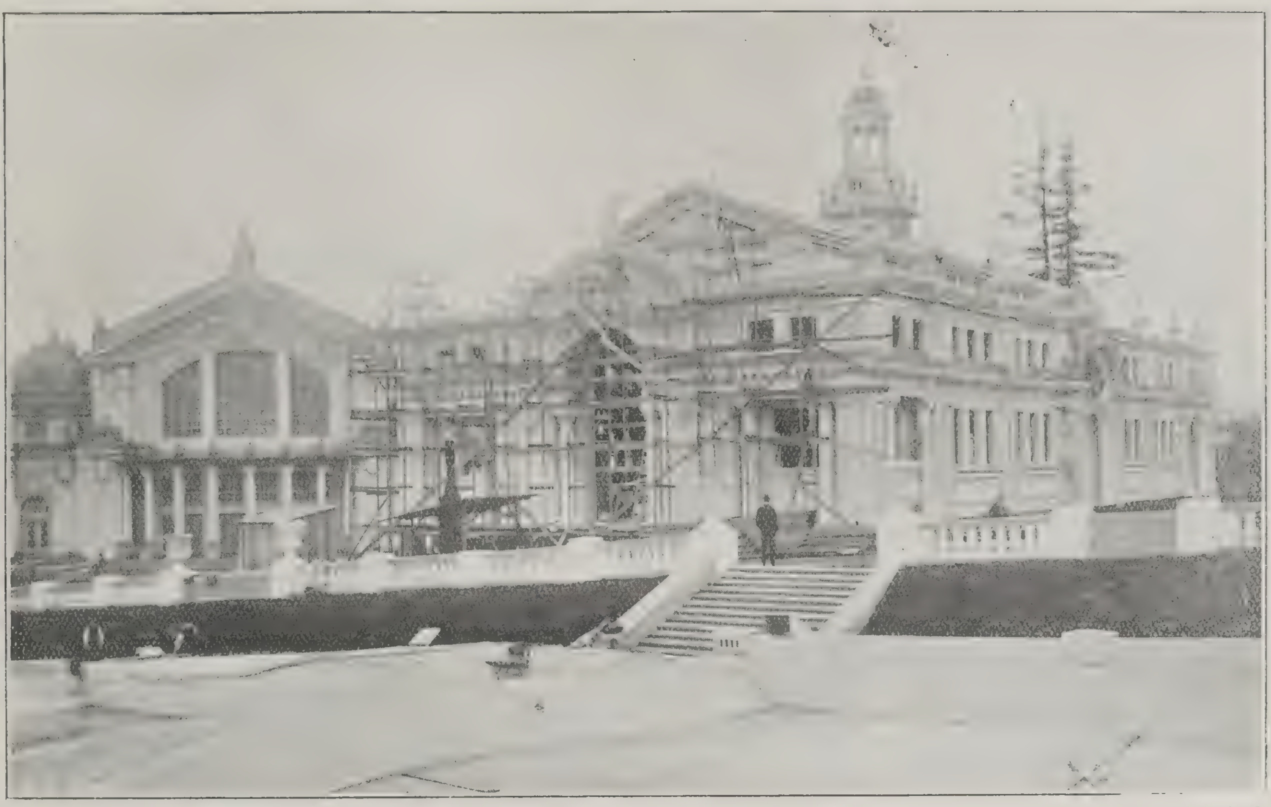
This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Sewage Purification Works for Small Town

NORTHAMPTON.—X. Y. Z. writes: "Kindly advise with respect to the drainage of a small town as shown in the accompanying plan (not reproduced)."

The scheme suggested consists essentially of a 24-in. diameter sewer, with a free outfall to the river at low water, but which will act as an inverted syphon during the three hours the sewer is tide-locked, when the sewage will rise to a depth of some 6 ft. in a chamber adjoining the river, from which it will throw on to a filter; and after percolating through it will be discharged into a stream adjoining the river, where it will accumulate until the tide has receded sufficiently to allow the stream water to be discharged into the river. During times of storm, when the filter is unable to cope with the full amount of liquid, the surplus will flow across the top of the filter and fall into the stream to accumulate. Hydrostatically there is nothing to prevent this scheme working; but from a sanitary point of view some considerable alterations are necessary, and if the work is to be carried out with the aid of a loan the design of the works must be such as would receive the sanction of the Local Government Board, whose requirements are being modified and brought up to date in accordance with the recent Royal Commission Report. The *normal* volume of sewage during the three hours tide-lock is given as 15,000, but regard must be had to the extreme variations in this quantity which will occur when high water is respectively at about 2 a.m. and 2 p.m. Inasmuch as the storage capacity of the 24-in. pipe is 10,000 gallons, two out of the three hours of tide-lock will be occupied in filling the syphon when there is a flow of 15,000; but when the flow is less than 10,000 gallons in the three hours the syphon will not fill at all, and the filter would be inoperative. There are many sanitary objections to a syphon of this nature, but there is no danger of the pipes lifting. Ballast and coke breeze would be suitable materials for the purification of sewage if arranged in a properly constructed and well aerated filter and the liquid is distributed by a suitable appliance, which conditions the pro-



THE ALASKA-YUKON PACIFIC FAIR, 1909. *Photo: Topical.*

Mines Building (*Left.*) The Washington State Fisheries Building (*Right.*)

posed filter does not fulfil. The fact of there being no water-closets in the town will not materially reduce the difficulty of purifying the sewage; the presence of spring water in the sewers only dilutes the sewage; it does not reduce the amount of matter to be purified. The overflow of unpurified storm sewage into the stream would cause serious nuisance, and should not be adopted. In order to be able to give details of a suitable scheme it would be necessary to visit the locality and to consider the question as a whole after taking the necessary levels.

HENRY ADAMS.

Rights of Adjoining Owners.

WALES.—P. G. F. writes: "I reside in a house marked B on enclosed plan (not reproduced). In June, 1905, I erected over the backyard of my house a glass roof, and also enclosed the open end with glass, thus forming a dry yard. This structure was erected self-supporting, not in any way fixed to or supported by A's wall. Owing to A's rain-water pipe, I was unable to fix my roof within 3 ins. of A's wall, and I got a lead apron, and laid it against A's wall and on my roof to catch some of the rain-water, and carry it on to roof. I had A's oral permission to do this at the time, but he now asks me to compensate him for the use of his wall as one side of this structure. What I would like to know is, has A any claim on me? And can I compel him to remove his rain-water pipe and shutes, which overhang my property, thus enabling me to place my roof close up to his wall, and so do away with the lead apron?"

If your roof is quite self-supporting, there can be no question but that you were within your legal rights in building it as you did; but, on the other hand you have no right whatever to use A's wall, and must remove the lead apron and everything that is attached to it. I should, however, fancy that a trifling payment of an acknowledgment rental would most comfortably settle the matter. With regard to A's alleged encroachments on your property, if you are quite sure that A's property ends at the face of his wall, you may certainly order the removal of his rain-water spouting—both the gutter part and also the downpipe. In any case, you may most certainly call upon him to rearrange his rain-water spouting in such a way as to cease to discharge his roof water into your property. If you leave it alone for nineteen years and a day, it is probable that A will acquire the right to discharge his water on to your property.

F. S. I.

Water Discoloured with Iron.

CAMBRIDGE.—BATNAC writes: "A new hot-water service consists of new kitchen range with steel boot back boiler, galvanised cylinder in adjoining scullery and galvanised cold supply cistern in room above bath room on first floor connected with Stewarts and Lloyd's' water quality blue-painted flow and return pipes. The supply of water is from a well, and the suction pipe (lead) goes from the pump in the scullery below the kitchen floor to the well about 20ft. away, and 14ft. deep. The pump is of iron, with an iron foot valve at the bottom of the suction pipe. The main trouble is that the water is very much discoloured, as though with rust, and tastes quite strongly of iron, although drawn direct from a tap on the pump. Also pieces of rust-scale up to an inch long come out of the taps over fittings on first floor. After about a month's use the boiler was cleaned out. Enclosed is a sample of what was taken out; it appears to be lime impregnated with rust. I enclose copy of analysis of the water and of the deposit taken from the boiler (not reproduced). Can you account for the discoloration and taste (not noticeable before the installation of new system), and can you advise a remedy or remedies?"

The rust is caused by the iron or steel water pipes between the boiler and the cistern, and the galvanising may have cracked off the hot water cistern by the expansion and contraction night and morning. The first thing to do is to substitute lead or copper pipes between the boiler and the cistern, and also examine the cistern and find out whether the galvanising has cracked off the iron. If the galvanising has cracked off, a new copper cistern is needed, and the inside of the boiler should soon have scaled over with such hard water as yours, and the tainting from that source would then cease; but you will find that boilers of iron or steel plate rust more quickly than those of cast iron. To coat the boiler and pipes with scale, and thus prevent the rust taint, open the hot-water tap a little and keep the water *boiling* for ten hours. If scale can be formed more quickly than rust it will adhere to the iron and steel; but the best remedy in your case is the installation of lead pipes and a copper cistern. If the water was soft, copper would be needed throughout. The iron foot-valve should give place to one of brass or gun metal; or even of wood (elm), with oak-tanned leather hinges or valve; or a perforated cast-iron galvanised strainer-box with a brass valve inside it would prevent rust at the source and hold water in the pump; but you may need a wooden or brass pump to get rid of the rust completely in the cold water.

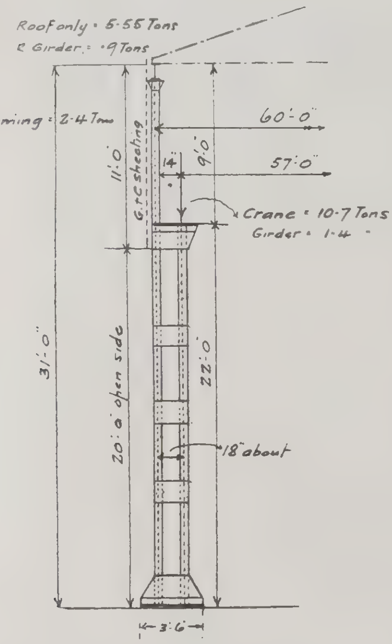
Partnership Question: Style of Firm.

PERTH.—REDSTONE writes: "Alpha and Omega carried on business under that name. Omega retired, and Alpha paid him up his share of the business, but nothing was mentioned at this time about the name. Alpha advertised that the business would still be carried on by him under the same firm name. Alpha died a year after, and left the business to his son, who took two other persons into partnership with him, and they advertised that the business would be carried on under the firm name of Alpha and Omega. After being in business one year, Omega wishes the new partners to sign a letter to the effect that he only allows his name to be used during his or his successor's pleasure. Can Omega call on the partners to sign this letter after the business being advertised in the way aforesaid and him taking no objection? In fact, the firm supplied Omega with goods, and signed the receipts under the firm's name."

I assume, of course, that when selling the business Omega transferred all his interest in the goodwill thereof to Alpha. That gave Alpha and his successors the right to use the name of Alpha and Omega, except in so far as might expose Omega to the risk of being held liable for the firm's debts. If Omega, by taking no step, allows the public to think him still a partner, and to rely on his credit, he might be held responsible. Therefore he is within his rights in objecting to the use of his name to that extent. Alpha may, however, style his business "Alpha, late Alpha and Omega." I do not understand Omega's claim that the permission is only during the pleasure of himself and his successors. His right to object is confined to himself. B.

Columns for Workshops.

There are many points arising in this problem which are difficult of theoretical treatment; the first points to settle are (1) the "fixing" of the columns; (2) what proportion of the wind or other horizontal forces can be considered as distributed to the other side of the building? We will assume that the columns are "free" at top as regards buckling in the plane of the paper, but will assume that only one half of the wind or other horizontal forces are carried by the stanchions on one side of the building. As far as the bending manents due to -the horizontal forces are concerned—and these form the most important factor in the present case—these will be almost the same on our assumption as if we assumed the columns fixed in direction at the top and took all the horizontal forces as being carried on one side, because the bending manents will be less if the ends are fixed in direction.



The horizontal forces are as follows:—

Wind blowing on side of building

$$=\frac{24\times11\times30}{2240}=3{\cdot}54 \text{ tons}$$

Wind blowing on roof

$$=\frac{24\times32.5\times6.7}{2240}=2{\cdot}33 \text{ tons}$$

Dragging force due to crane in

cross travel = say $\frac{1}{10}$ of load = 1 ton.

The bending manent at the base of the column due to these forces are as follows:—

Wind on side $=3.54\times25.5\times12=1082$ in.-tons
Wind on roof $=2.33\times31\times12=866$ in.-tons
Dragging force on crane
$=1\times12\times22=264$ in.-tons

Total $=2212$ in.-tons

∴ B.M. to be carried at the base of each column $=\frac{2212}{2}=1106$ inch tons.

Suppose the column consists of 2 18″×7″ Standard I. beams spaced at 18″ centres. The sectional area will then be $2\times221=44.2$ sq. in. The radius of gyration about a centre line at right angles to the plane of the paper will be $\sqrt{9^2+1{\cdot}45^2}=9{\cdot}12$.

$$\therefore \text{section modulus}=\frac{44.2\times9.12^2}{12.5}$$
$=294$ inch units nearly

$$\therefore \text{stress due to bending}=\frac{\text{bending-manent}}{\text{modulus}}=\frac{1106}{294}$$
$=3.76$ tons per sq. in.

This leaves $6-3.76=2.24$ tons per sq. in. to be provided by direct compression.

Next consider the loads acting on the column.

Load on roof column:—

Roof and roof girder $=5.55+.9$ $=6.45$ tons
Framing $=2.4$ tons

$$\text{Vertical pressure of wind}=\frac{3}{4}\cdot\frac{32.5\times17.4\times24}{2240}$$
$=4.55$ tons
13.4 tons

Load on crane column $=10.7+1.4=12.1$ tons. The total load $=25.5$ tons, and as the two portions are very nearly equal, this may be taken as acting centrally.

The equivalent length of this compound column $=2\times22=44$ feet

$$\therefore \text{Safe load}=\frac{f_c}{1+\frac{1}{6000}\left(\frac{44\times12}{9.12}\right)^2}=\frac{2.24}{1+.75}$$

$$=\frac{2.24}{1.56}=1.43 \text{ tons per sq. in.}$$

$$\text{Direct stress}=\frac{25.5}{44.2}=.57 \text{ tons per sq. in.}$$

This may be taken as satisfactory. We use the method shown above, and not that given for eccentric loading, because the stress due to horizontal loads is a maximum only at the base where the buckling tendency is least, so that this case is not so serious as that of eccentric loading. It should also be noted that we have treated the load given from the crane as the equivalent dead load.

The strength in a direction at right angles to the plane of the paper will be found to be ample.

Next consider the strength of the roof portion of the column above the point where it joins the crane portion.

B.M. due to wind on side $=3.54\times4.5\times12$
$=191$ in.-tons
B.M. due to wind on roof $=2.33\times9\times12$
$=252$ in.-tons

Total $=443$ in.-tons

$$\therefore \text{B.M. on each side}=\frac{443}{2}=221{\cdot}5 \text{ in.-tons}$$

Sections Modulus $=13.3$.

$$\therefore \text{Stress}=\frac{221.5}{13.3}=16{\cdot}7 \text{ tons per sq. in.}$$

This is much too much, and the column must be strengthened. This could be done if it is desirable to keep the clearance as much as possible by riveting a 8in. by 3½in. channel to each flange. The increase in section modulus would be $2\times15.94=31.88$, the total modulus then coming

$$13.3+31.88=45.18$$

$$\therefore \text{Stress}=\frac{221.5}{45.18}=4{\cdot}9 \text{ tons per sq. in.}$$

This leaves 1.1 tons per sq. in. for the direct load consideration; since the direct load is 13.4 tons, and the total area

$22.1+26.6=48.7$ the direct stress

$$=\frac{13.4}{48.7}=.28 \text{ tons}$$

per sq. inch, which will be good enough.

The question of the foundation is more one of fixing securely to overcome the bending manent than of carrying the direct load; for this reason it would probably be more satisfactory to bury the end of the column in concrete. The size of the bolts to tie the column to a concrete base can be found approximately as follows:—Assume column turns about one pair of bolts, the bolts being at 3ft. centres. Then by manents, force on each bolt.

$$\frac{\text{B.M.}}{2\times36}=\frac{1106}{2\times36}=15.3 \text{ tons.}$$

$$\therefore \text{necessary area of each bolt}=\frac{15.3}{7.}$$
$=2.2$ sq. in.

This would be given by 1¾in. bolts. A 1in. base plate will be satisfactory if it is very securely stiffened. A.

Steel Columns and Struts.

In reply to query by Thornton Heath, P.C.E.B., on "Steel Columns and Struts," in present issue of "Builders' Journal," I note value for C is given as follows, viz:—For sections mild steel one I beam $=\frac{1}{300}$.

For sections mild steel two or more I beams $=\frac{1}{480}$.

The $\frac{1}{300}$ agrees with page 344 in Mr. Andrews' book, but for built-up stanchions the value given is $\frac{1}{400}$ not $\frac{1}{480}$. Please say which is correct?"

The value given by me in the "Builders' Journal" of February 17th, for the constant in Gordon's formula for two or more

I a [s vir $c=\frac{1}{480}$

was calculated afresh from a number of cases taken at random, to agree with Rankine's formula as given by me, viz.:—

$$f_p=\frac{6}{1+\frac{1}{6000}\left(\frac{L}{k}\right)^2}$$

Strictly, one should use a different constant for every different section in Gordon's formula, $\frac{1}{480}$ being about the mean of a number of examples that I chose. The value of this constant can be calculated in the following manner:—

Take for example a stanchion composed of two 14in. by 6in. by 57lb. I beams at 8½in. centres and two 16in. by ⅝in. plates. The minimum radius of gyration of this section is 4.50 in., and the value of d in Gordon's formula is 15.25in.

Therefore if c is the constant of Gordon's formula, to agree with Rankine's formula—

$$C\times15.25^2=6000\times4.50^2$$
$$C=\frac{6000\times4.50^2}{15.25^2}=520 \text{ nearly}$$

Next take a section composed of two 10 in. by 3½ in. by 28.21 lb. channels at 4½ in. apart, and four 12 in. by ⅝ in. plates—

k min. $=3\,42$
d $=12$

$$\therefore c=\frac{6000\times3{\cdot}42^2}{12^2}=487 \text{ about.}$$

Take also a section composed of three 16 in. by 6 in. by 62 lb. I beams at 6½ in. centres, and six 20 in. by ⅝ in. plates—

k min. $=5.63$
d $=19.75$

$$\therefore C=\frac{6000\times5.63^2}{19.75^2}=487 \text{ about.}$$

Take finally a section composed of two 12 in. by 6 in. by 54 lb. I beams at 7 in. centres and four 14 in. by ⅝ in. plates—

k min. $=3.90$
d $=14$

$$C=\frac{6000\times3.90^2}{142}=467 \text{ about.}$$

Calculations of this kind show that $\frac{1}{480}$ is a good mean value for stancheons composed of plates and two or more I beams. For sections with channels the value of c may apparently be taken higher still, say $\frac{1}{550}$ as a mean figure. For a lattice channel, for example, of two 10in. by 3½in. by 28.31lb. channels at 6½ in. centres c comes as much as $\frac{1}{660}$. The large variation points to the desirability of using Rankine's formula in preference to Gordon's. A.

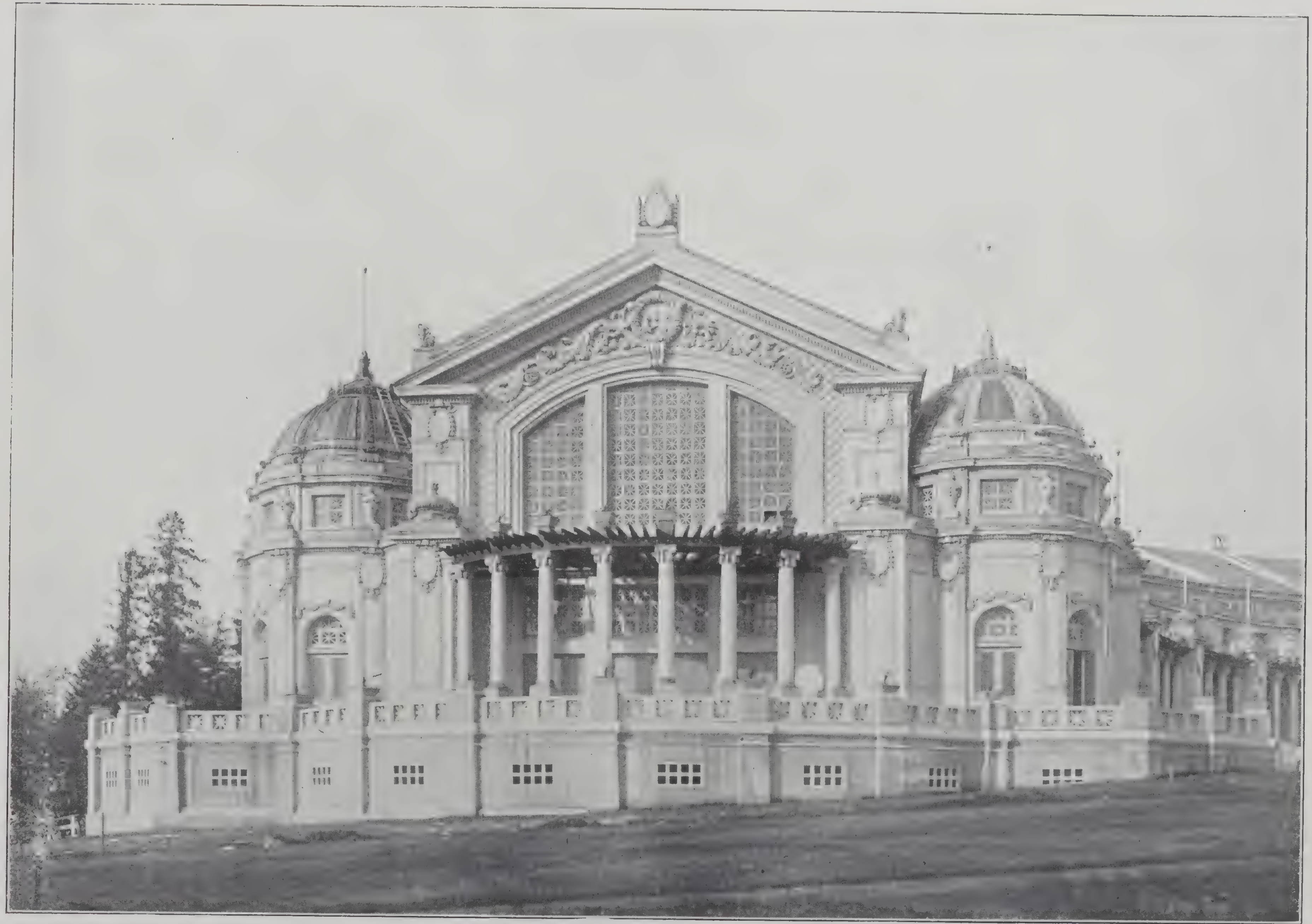
Strength of Compound Girder–Correction.

My attention has been drawn to a slip in my reply to "Calculator" in the "Builder's Journal" of February 3rd, which may cause confusion to some readers. The expression for the position of the centroid should be

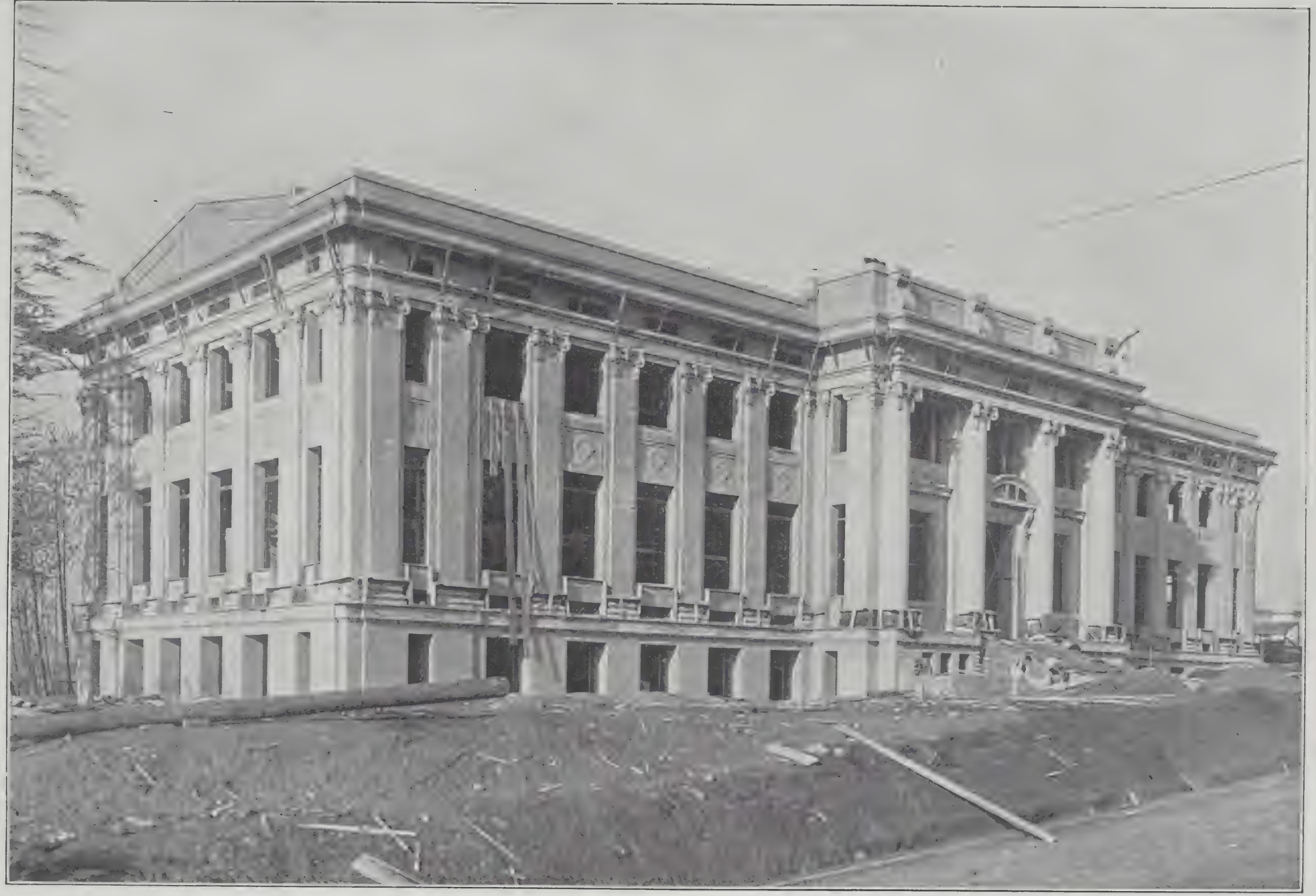
$$d=\frac{ax}{2A+a} \text{ instead of } d=\frac{ax}{2A}$$

and d should of course be the distance to the centre of the joists, not the plates. This will affect the numerical example given, although the method is otherwise quite correct; d should be 1.4in. nearly, and $Z=95$ nearly, thus making $W=2.25w$ nearly. A.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



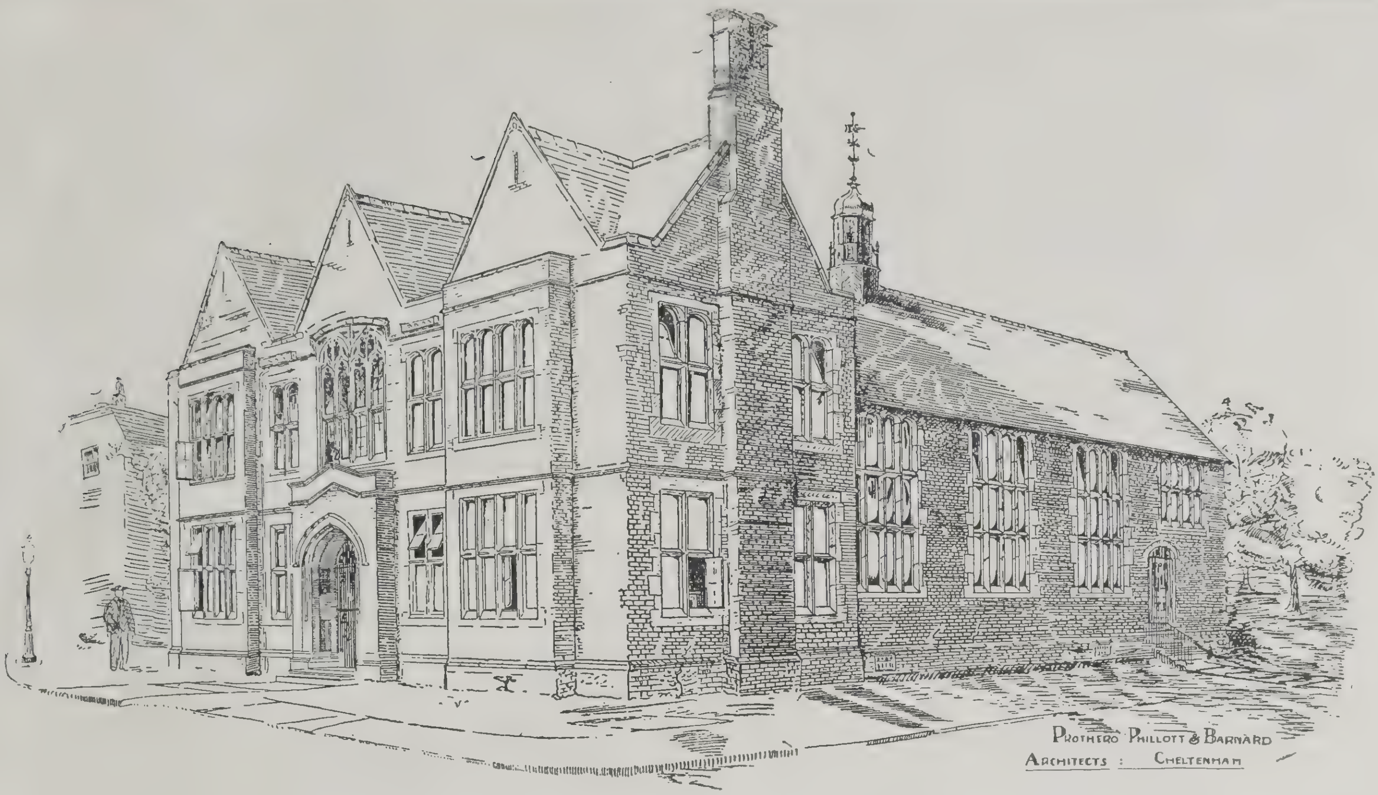
The Agricultural Building. The Pergolas—one of which is seen on the extreme right—to be covered with flowering vines, will be a feature of the fair.



The Fine Art Building. One of the permanent structures that will revert to the University of Washington. *Photos: Topical.*

BUILDINGS AT THE ALASKA-YUKON PACIFIC FAIR, SEATTLE, WHICH IS TO BE OPENED NEXT MONTH BY PRESIDENT TAFT.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



Wrexham Church House.

NEW CHURCH HOUSE, WREXHAM.

This building is to be erected at the corner of Regent Street, near St. Mark's Church. The design is in late Gothic style, of red brick with stone dressings, and the roof is covered with green slates. The front part is of two stories, and comprises an entrance hall and two committee rooms. A small bar is situated under the stairs for dispensing light refreshments when required, this communicating with the caretaker's kitchen. On the first floor there are a club room and a full-sized billiard room, with raised recess for games. The floors of this part are fireproof construction of reinforced concrete by the Armoured Tubular Flooring Co. The main hall is capable of seating over 400, measures 65ft. by 35ft., and has a raised platform with changing rooms and lavatories at the back. In the basement there are to be a miniature rifle range and rifle room, and a large storage room for chairs. The rifle range is 25yds. long, and will be absolutely safe, as there is a concrete roof. The contractor for the building is Mr. W. E. Samuel, of Market Street, Wrexham, Messrs. Prothero, Phillott and Barnard being the architects.

Our Plate.

We give this week views of the Agricultural Building and the Fine Art Building at the forthcoming Alaska-Yukon Pacific Fair, Seattle, which is to be opened next month. The site is on the grounds of the University of Washington, in the midst of a great fir forest on Puget Sound, and faces three mountain ranges, so that its surroundings are both picturesque and unique. The Forestry Building can claim to be the largest log-house in the world, and there are other buildings for Agriculture, Manufactures, Fisheries, Mines, Fine Art, and Transportation, beside the Auditorium, the United States Government Buildings (including the Alaska, Hawaii, Philippines, and the Government Fisheries Buildings) and those of the foreign countries. The Washington State Building will cost £25,000, and there are also four county buildings. Most of the buildings are of a permanent character, and will remain standing. Views of other buildings are given in the text.

THE SPECIFICATION AND INSPECTION OF TIMBER.

By J. Davies.

Abstract of a paper read before the Society of Architects on March 11th, by Mr. J. Davies, of "The Timber News."

The question is, what forms of timber can the architect specify for use in a given building, which will on the one hand give his client the best value for his money, and will on the other permit the contractor and timber merchant to supply what is wanted without undue inconvenience?

Many of the ports which once sent us large quantities of the fir, pine, or deal, so largely used in building construction, both for joiners' and carpenters' work, have ceased to exist as sources of supply, and conversely other ports, till recently unknown, are now exporting to England some of the best and most suitable shipments.

Out-of-Date Text Books.

Although there is no lack of literature dealing with wood, most of the available books were published many years ago, before the conditions of to-day began to prevail. Some of the students' handbooks deal with the point in an incidental and casual way, and the chapters setting forth the ports of origin are obviously copied from the earlier works referred to. Others are content to generalise, and state that our yellow and white deal come from Russia, Sweden, and Norway; but this leaves us where we were, and does nothing towards helping us to differentiate between the various brands or shipments.

It may be urged that the architect need not interest himself in areas of origin, ports of shipment, or brands, it being his duty to see that good sound timber is supplied, irrespective of any other consideration. This might hold good, if the standard of quality required by different classes of work were always the same, and if builders and contractors were philanthropists eager only to please their clients and to achieve the highest possible level of artistic excellence in their work.

Timber Merchants' Appeal to Architects.

But we have to deal with materials, and men, as we find them, and it has been the custom of the profession to lay down in its specifications certain definitions of what it requires in the way of timber for constructional and decorative work. Now I submit that the timber merchant and contractor are entirely within their rights in asking that the description of timber in architects' specifications shall be clear and definite, and as far as possible in accordance with the reasonable convenience of the trade. So far from deprecating any close and detailed limitations in the timber clauses, the sensible contractor asks for them. Nothing would please him better than to know that the terms used in describing the wood are meant, and will be strictly enforced. Then, to use his own expression, he knows where he is, and can tender accordingly. Estimators now frequently complain that the formulæ usually put before them tell them little or nothing. If they read them literally, they would never secure a contract under open competition. They have to consider the class of erection in question, and the idiosyncrasies and prejudices of the architect, so far as they are known to exist, plus the possibility of trouble from the clerk of works. I attach so much importance to these considerations that, at the risk of labouring the point, I wish to warn the profession that, so far from securing the desired level of quality, the clauses in question frequently open the door to the substitution of inferior materials. If the contractor demonstrates the inability o the timber merchants to supply satisfactory material of the exact description specified, and obtains permission to supply something equal thereto, a great deal is at once left to his own discretion. Further, the more punctilious a builder is, the more will he suffer from the easy morality of his less scrupulous rivals, who by taking the fullest advantages of such opportunities, turn out their woodwork at a lower price and can tender accordingly.

Interpreting Timber Specifications.

In my own experience, I have learnt to associate many of the well-known builders and contractors with a certain set standard so far as their purchases are concerned. It varies with every firm, the experience of no two establishments being exactly alike. There are many who permanently exhibit as intense anxiety to carry out their woodwork in a manner creditable to themselves and just to the architects for whom they work.

Even these are sometimes involved in serious difficulties through varying intepretations of timber specifications, and grave injustice has been inflicted upon them by the inability of architects to realise the difficulties of the situation. On the other hand, there are a few who prefer the existing state of things, and see in it opportunities for using indifferent wood under the excuse that what was specified is unobtainable, and that "this is just as good."

I commend these facts to those who, possibly by reason of their own experience having been free from difficulties of the sort, are inclined to think the present system is sufficient. Of course there are countless instances in which the good faith of the builders and the sound common sense of the architect (best exhibited, when he has a conscientious firm working for him, in leaving as much to them as he can), have surmounted all difficulties without friction. Still, the possibilities of trouble are always there, and the wide differences between sundry clauses taken from recently issued bills of quantities, which I will quote from now, will show clearly that all cannot be right, and some must be wrong. For obvious reasons, I abstain from quoting any clause *in extenso*, but extract the phrases to which exception is taken. The first reads thus:—"The joiners' work to be executed with the best yellow Christiania or best red Petersburg deal"; and the second as follows:—"The joiners' work to be the best Christiania or equal quality deals." But although familiar with importers' stocks and the contents of the dock storage sheds, I should not know where to find a Christiania deal or plank. It may be found right to name a port of shipment, and it may be thought better to omit it; but it cannot be right to name a port which has entirely ceased to exist as a source of supply.

One of these clauses permits the use of Petersburg stuff. This is more reasonable, but is open to the objection that it rules out by implication other ports which send better and milder wood than any we now get from that place. Petersburg wood has shared the deterioration which has characterised the whole of our imports, and even the finest parcels show a considerable proportion of centres, knots, and sap. Another firm specifies the best Gefle yellow deal for joinery. This is nearer the mark, but similarly rules out other equally good Swedish shipments, and the even more useful material which comes from the White Sea, except by the indulgence of the architect.

Another says:—"Joinery to be first quality red Onega, Gefle, or American growth." This gives Onega the preference over other Archangel ports, which now send equally good wood, and rules out Petersburg as well as various Swedish imports. The American growth referred to is doubtless red or yellow pine, which will be dealt with in due course. The next gives Onega, Petersburg, or Archangel, leaving no room for even the best of the Swedish stuff. Altogether, it is clear that the information upon which these clauses have been based is very fragmentary, and is greatly in need of revision. The same applies to the phrases governing the carcassing or carpentry. One says:—"The timber for carpenters' work to be the best Memel, Danzig, or Riga fir, and no American, Swedish or Scots fir is to be used in any part of the building." You will agree that the wording of this clause suggests that the compiler meant what he said. Let us look at it for a moment. Memel has ceased to send us fir. Riga still sends us fir, but not of the former quality. Danzig still sends us fir, in diminished quantities, of smaller sizes and lower quality than in the past. American red pine, which when obtainable is considered equal to any European stuff, is barred. Swedish fir is excluded. This rules out the firm, tough, and elastic wood which comes in abundance from the best Swedish ports, and which is largely used for high-class timbering. What is meant by the exclusion of Scots fir is not clear. If the writer used the term commercially, indicating place of origin, it is necessary, as the quantity of Scots fir or pine used in England or Scotland is negligible, and would not enter into a builder's calculations. If he used the word botanically, to cover a species, he stultifies himself, as the Danzig fir, which he admits, and the Scots fir, which he bars, are one and the same thing. No mention is made of Petersburg wood, which includes some very strong carcassing stuff.

When Tendering becomes a Lottery.

Altogether the terms are very confusing, and make tendering under these clauses very much of a lottery until the personal intentions of the architect are ascertained. Some of the most formidable clauses are the easiest to work under, being recognised as a sort of Thirty-nine Articles, not calling for too literal an interpretation, and never referred to so long as the contractor behaves himself. But there they are, a rod in pickle for him, to be applied at the architect's discretion. Another specification requires as much as possible of the timber to be cut from deals, and not from baulks, with the avowed object of getting it better seasoned. This implies the use of Swedish or Russian stuff.

Summarizing the carcassing clauses, none of them specify the wood mostly used for constructional work where dimensions that are over 12ins. by 4ins. are required, viz., pitch pine, or, in some cases Oregon or British Columbian pine.

Most of our

Schools and Municipal Buildings

are timbered in pitch pine or Oregon pine, so far as the bigger sizes go, and in Russian or Swedish deals and battens where the smaller dimensions are concerned. Yet these items are not specified. Here we have a complete divorce between precept and practice, fraught with possibilities of endless disputes between the profession and the contractors. The right of veto being with the former, the necessity of revision may not appeal to them with such force as to the builders; but the feeling on the part of the latter is very strong, and the expressions which one hears in the ordinary course of business about archaic and obsolete restrictions are more crisp than elegant.

New Formulæ to meet the Case.

It is one thing to condemn, however, and another to create, and it must be admitted that the task of compiling clauses which will govern the use of timber with fairness to all parties is not an easy one. Still, with your indulgence, I propose to attempt it, and will put forward formulæ which appear to me to meet the case. I am not at all dogmatic about their details, and invite the co-operation of my audience in shaping them in such a way as fully to cover the legitimate requirements of the profession, as well as of the timber and building trades. They will be much more authoritative if appearing with the hall-mark of this society. If we can agree upon their terms, I venture to hope that your members will officially adopt them, thereby taking, as a corporate body, an active part in effecting a much-needed reform. Before they are placed before you, it may be appropriate to make a rapid survey of the important features of the timber trade to-day, with special reference to the soft woods which we have been considering, and which form by far the largest proportion of imports. It will be necessary to examine the nomenclature of the staple building wood in some detail, the terms which are variously applied to it being very puzzling to the uninitiated.

Fir that is Pine.

Although we speak of Memel or Danzig fir, the tree which yields it is a pine, botanically known as *Pinus sylvestris*, a coniferous, needle-leaved tree, growing very widely in Russia, Germany, Sweden and Norway, and in some parts of Scotland and the north of England. Whether we receive it in the form of squared hewn logs from Danzig, or planks, deals and boards from Russia, Sweden, and Norway, the wood is essentially the same, variations in its texture and quality being brought about by differences of climate and soil. That is why it is so difficult to draw distinctions between the shipments from various ports, any one shipment containing both fine, slowly grown, and clean wood from the highlands, and coarse, wide-ringed and spongy stuff from the lower and moister ground. A joiner may get hold of a nice clean mild-working deal of a particular brand and swear by it ever after, giving precedence to a shipment the average quality of which may be very ordinary. Or he may come across a piece which is harsh and inclined to warp, or so resinous as to make it impossible for him to get a smooth surface upon it. He is then likely to condemn that mark for good, although its average quality may be very high. Possibly this is one reason why the men who actually work the wood differ so widely in their opinions about it, and make such unreliable guides upon the subject. It is known to the shippers as red, and is so called in the Midlands and North; but most merchants and consumers in the South know it as yellow. It is thus variously called redwood, red deal, yellow deal, Baltic, Memel, or Danzig fir, which are quite enough to go on with; and has even two more names, Northern pine and Scots fir, although these two are fortunately not often met with in the South. It may be noticed here that the word deal is also used to denote a size, as 9 by 3, and in this connection has no relation to the name of the wood itself. It is the wood about which nearly all the disputes occur, and is the one which is usually specified for most forms of building construction, so that we are justified in spending some time upon it. From thirty to fifty years ago it mainly came from Memel and Danzig, Stettin, and Riga, in the form of logs, both round and squared. These were converted into carcassing and joiners' stuff in England, and undoubtedly yielded a large proportion of the finest and most durable wood. But as time went on, Russia and Sweden developed an export trade in what is, as we have explained, botanically the same tree. It came from these places in a more easily merchantable form, viz., sawn square-edged planks, deals, battens, and boards. Naturally, the saving effected in buying the converted sizes had an effect upon the trade in Danzig and Memel stuff, and the imports of the latter fell away, until now we get very little indeed. Still, as it was then correct to specify the latter variety, the terms became very firmly embodied in architects' specifications, and have been copied and re-copied until to-day. The situation is complicated by this fact, that, although Riga fir is no longer of desirable quality, and Memel fir is a thing of the past, we still get these hewn squared logs from Danzig, and if an architect absolutely insists upon it, they can be had, although only in limited quantities, and of very ordinary quality. Consequently, the builder who meets the re-copied clause in a specification is faced by the probability that the architect is only using a figure of speech, but also the possibility that he has some reason for using the words, and actually wants Memel or Danzig fir.

It will next be considered whether there is any special virtue in that wood, as compared with the best Swedish or Russian stuff.

(To be concluded.)

FIRE-RESISTING MILL AT BRIGHOUSE.

The spinning mills of Messrs. Wood Brothers and Sons, Ltd., at Brighouse, Yorks, are being extended. The new building will be 200ft. long, 64ft. wide, and 40ft. high from ground level, and is being constructed over an existing reservoir. There are three floors and roof, and the building is designed to take silk spinning frames, and to be entirely free from vibration. The whole of the structural work is of reinforced concrete with Kahn reinforcement, and the contract has been taken by the Trussed Concrete Steel Co., Ltd., of Westminster and Newcastle-on-Tyne. Messrs. Sharp and Waller, Brighouse, are the architects.

FIRE-RESISTING CONSTRUCTION SECTION.

(MONTHLY.)

CONSTRUCTION OF EARTHQUAKE-PROOF DWELLINGS.

By Caesar Pesenti, Engineer.

Translated from "Il Cemento," of Feb. 15, 1909.

To make a house intended for a locality subject to frequent seismic movements really practical and safe, certain requirements must be fulfilled.

As a result of researches here and in other countries visited by earthquakes, it has been found that the dwellings must not only fulfil all the requirements of modern construction, but must also be able to resist shocks. In this respect the following conditions need to be observed:—

1. The construction of the building should be monolithic, without discontinuation or imperfect joining.
2. The monolith should have great elasticity in every part.
3. It should be as light as possible.
4. The building should be of minimum height, two storeys at most—ground floor and first floor.
5. It must be of comparatively low cost, compatible with the use of the persons for whom it is intended. It must also be hygienic.
6. The building should be able to stand wear and tear of atmospheric influences, etc.
7. It must be able to remain dry, and therefore should be built of non-porous materials. Also it must not harbour the myriads of microbes which are to be found in the wooden houses of earlier date, and of which a distressing example was afforded by the ruined buildings of Reggio and Messina.
8. The building must be fire-resisting.
9. It must keep out both cold and heat.

The writer, from personal experience, adds to the above that buildings can only be rendered absolutely indestructable by earthquake when the following requirements are also fulfilled:—

(a) The building itself must not simply be placed on the ground and fixed to the same by foundations, but must be completely separated from its foundation; in other words, the foundation and the building should form two entirely separate structures, each independent of the other; the building thus being capable of being displaced from the foundation which supports it.

(b) The points of contact between the foundation and the building must be as few and as small as possible.

(c) These points of contact must be perfectly smooth.

(d) The points of contact must be built in such a manner as to prevent conduction of the shock from the foundation to the upper storeys and vice versa, and also be built in such a manner that the shock is lessened and absorbed by the interposition of a material of great elasticity between the points of contact.

We will now carefully consider the above list of requirements and make the necessary deductions.

The requirements Nos. 1 to 9 can be easily met by reinforced concrete, a system of construction which is now generally used and which has been tried on a very large scale. This system, which is already half a century old, is used for the most varied purposes, such as for private and public buildings, which are subject to the most varied loads, for bridges, streets, and railways, aqueducts, reservoirs, etc., etc. We find it used nowadays for all buildings which were previously only possible in iron, wood, and masonry, and also for those which are intended for countries subject to violent shocks. We cannot, therefore, get away from the assertion that the structure either of a public building or of a dwelling house could be most conveniently made in reinforced concrete, which has great elasticity, resists shocks and fire, possesses hygienic qualities, and is capable of keeping out cold and heat, and also of being moved with comparative ease from one place to another. On this point I believe no one could reasonably raise the objection that the fact that some houses built of reinforced concrete were damaged or destroyed in the recent earthquake was sufficient to prove the contrary. It could not be claimed in any way that these houses which were destroyed were built of reinforced concrete, although they were partly built in iron and partly in concrete, brick, and broken stone. Although the different parts were framed together, they were not monolithic constructions, and monolithic character is the first requirement laid down. However, I do not pretend to demonstrate that a building in reinforced concrete, even made according to scientific rules, but with the usual foundations, would have absolutely resisted the shocks and violent seismic movements which took place in Sicily and Calabria. Rather, in fact, I would be the first to admit that these buildings, though they resisted better than the others, would necessarily crack. But I maintain that such damage would not have occurred if the buildings had been monolithic and constructed of reinforced concrete, which were among the first requirements mentioned, and if they also fulfilled all the requirements which I gave under (a), (b), (c), (d).

The accompanying illustrations show a house built with thin double walls, composed of a meshwork of small steel rods which act, so to speak, as tendons of our body or of iron lathing, protected by a layer of cement; in a word, a cage of iron surrounded by a larger iron cage and joined to the first by a thin partition, something like what has been done already in the buildings erected at the factory of Clusone, or like those executed in reinforced concrete with double thin partition walls by the Societa di Navigazione on Lake Iseo for docks, reservoirs, etc.

This building constructed then as a large cage, as above described, with double walls connected by partitions, or bonders, should be divided in half horizontally from another similar cage construction, which serves as a division between the ground floor and the first floor, and be divided by other vertical divisional walls between the different external walls of the house.

The framework—light, elastic, and comparatively indestructible—would have as many points of support as there are angles of the outside walls at ground floor level. The points of support would be covered by an armouring of iron or of galvanised steel, without points and flat underneath.

The armoured feet would rest on a single monolithic platform of reinforced concrete. This ought to be much longer than the perimeter of the house so as to form, under normal conditions, a raised stoep around the house, and should have as many iron or steel plates as there are feet, each solidly connected to the concrete of the platform.

A layer of a different elastic material (for instance, lead or some other metallic composition which is not too hard), should be applied between the columns of the foundations and the platform in order to lessen and absorb the vertical shocks. The platform should be calculated to provide sufficient resistance to sustain the weight of the building when the platform is at its normal level, as when there is any upheaval of the ground the platform is raised at the ends, so that the centre of gravity of the whole system is almost at the point of passing out of boundary of the plan itself, in which case an inclination of the whole building would inevitably result owing to the platform being supported only at the two ends and being free in the middle. The platform of reinforced concrete should therefore rest freely on the ground, well pinned down in such a way that it forms a raised stoep giving access to the building.

Now let us consider how these buildings would act under the influence of earthquakes. An earthquake shock may be undulating or vertical, or both together. In certain places there is also a rotary movement. At Messina a monument was deflected about 90 degrees. If these movements are rythmic and slow the whole building should follow them without injury of any kind. This is so true that in most cases these same even movements do no great damage even to the disjointed constructions of former times. But if instead they are violent and of unexpected frequency, while they undoubtedly cause the destruction of the old buildings, they can never demolish new buildings constructed on the principle suggested above. If the building rests with few points of contact on the large platform and is well placed thereon, no matter how strong and sudden the shocks may be, the platform must follow them in a limited manner, and the building will follow in a still less manner. And this by the law of the inertia of matter. This can be proved by very simple experiments. Let us

Fig. 1.

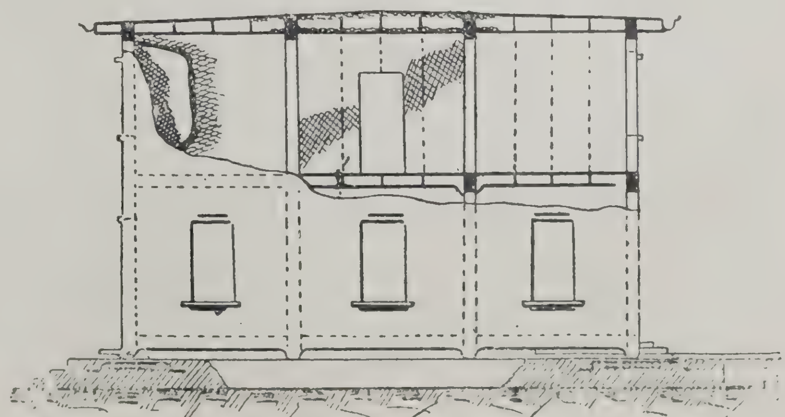
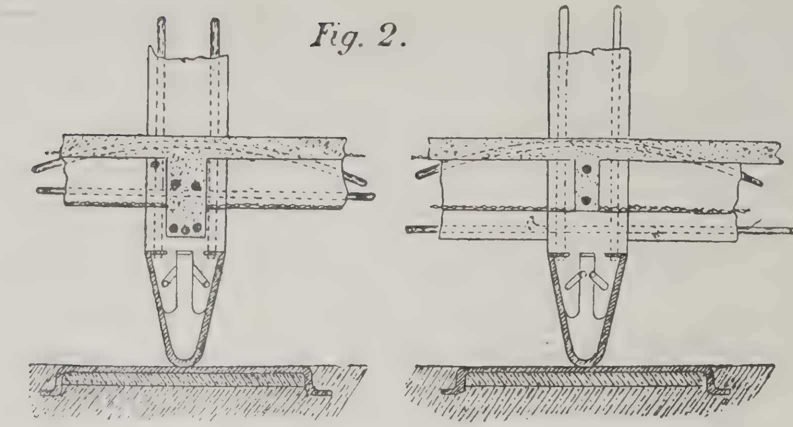


Fig. 2.



place on a thin lath a second thinner lath, and on the latter put a stool. If we try to move or take away the lower lath by a violent jerk or pull, the upper lath will only partially follow the motion and the stool even less, the latter almost remaining in its original position.

There is a family game which shows the idea still better. Put a playing card on the top of the thumb of the left hand and put a coin on the card. Then strike the card sharply with the middle finger of the right hand, and the card will jump away, the coin remaining on the thumb. The lower lath and the card represent in our case the earth under the influence of a violent seismic movement; the top lath represents the platform supporting the building, the stool and the coin represent the building itself.

I also thought of placing ball-bearings of steel between the foundation columns and the metal plate, but the too easy sliding caused by the interposition of these balls between the foundation and the structure could, it seems to the writer, become dangerous in case of violent oscillations; because, instead of itself moving, the plate under the building would set up a vibration all over the building.

For the vertical shocks which would in certain cases in ordinary buildings be more dangerous than undulating and rotary shocks, buildings built in this manner could not be affected by them, inasmuch as the ground on which the plate rests and the rather thin layer of metal under the foundation column supporting the house should lessen the shocks to a great extent. I can also prove this by a simple experiment.

If a blacksmith's anvil is placed on a soffit, the latter, even though made of reinforced concrete and resisting shocks, will be finally put out of place if repeated blows of a hammer are struck on the anvil; if, on the other hand, we place a slab of wood or a layer of sand or gravel between the soffit and the anvil, the former will not suffer at all under the blows.

At this point it should be noted that my deductions seem to be contrary to the opinions of the celebrated seismologists and geologists P. Cecchi, P. Alfani, B. Bertelli, P. Serpieri, Densa, Mici, Stoppani, and others given in the interesting treatise, "Earthquakes and Houses," of P. Alfani.

The studies and observations of these scientists are, however, based on ordinary constructions, which (differing from those made of reinforced concrete described by me) in order to have a certain amount of stability should have good foundations in the ground, or, better still, in hard and compact rock. For if this is not done it is evident that the least movement of the sub-soil on which the building rests would cause the destruction of the building, which is disjointed and easily put out of shape.

My arguments are, therefore, based on a point of departure diametrically opposite to those of the above-mentioned celebrated seismologists, and it is not to be wondered if the conclusions come to by me are found to be in contradiction to theirs.

To conclude, I am convinced that the first problem of the future regarding new constructions in lands swept by earthquakes should be the profound study, aided with practical experiments, of the programme which I have briefly sketched, consisting above all in a free house on free foundations and in the use of reinforced concrete, with the object of giving to the structure homogeneity, elasticity, lightness, and at the same time to follow the manifold and just requirements of modern construction.

THE CONCRETE INSTITUTE.

The Concrete Institute, which was founded last year, has now attained a membership exceeding 600, of whom the larger number are members of the Institution of Civil Engineers, Royal Engineer officers, architects and surveyors holding public appointments or practising in their private capacity. The Institute has already been incorporated, the incorporation having recently been granted by the authorities concerned.

The governing body is a council of 28 members, among whom are the Earl of Plymouth, C.B., President, Sir Douglas Fox, J.P., Sir Wm. Mather, LL.D., Sir Wm. Preece, K.C.B., Sir Henry Tanner, I.S.O., vice-presidents; Mr. Edwin O. Sachs, F.R.S.Ed., chairman; Mr. E. P. Wells, J.P., hon. treasurer; and Mr. A. E. Collins, M.Inst.C.E., hon. secretary.

Standing committees have been elected to deal with various technical matters, and sub-committees of these standing committees have already been appointed to deal with matters of detail. It may be of interest to note the list of standing committees with the names of their chairmen and hon. secretaries. They comprise the following:—

Science Standing Committee.—Mr. William Dunn, F.R.I.B.A., chairman, and Mr. F. E. Wentworth-Shields, M.Inst.C.E., hon. sec.

Parliamentary Standing Committee.—Mr. A. Ross, M.Inst.C.E., chairman, and Mr. J. Ernest Franck, A.R.I.B.A., hon. secretary.

Reinforced Concrete Practice Standing Committee.—The Chairman of the Executive, chairman pro. tem., and Mr. R. W. Vawdrey, B.A., Assoc.M.Inst.C.E., hon. secretary.

Tests Standing Committee.—Mr. W. T. Hatch, M.Inst.C.E., chairman, and Mr. W. G. Kirkaldy, Assoc.M.Inst.C.E., hon. secretary.

Mass Concrete Standing Committee.—Mr. C H. Colson, M.Inst.C.E., chairman.

The number of general meetings already held is four, and the next meeting will take place at the Royal United Service Institution, on May 27th. The council and committee meetings take place at the offices of the Institute, No. 1, Waterloo Place, Pall Mall, S.W., to which address applications as to particulars should be made.

The Institute is taking up a strong position in the matter of the proposed amendments to the London Building Acts, and has petitioned Parliament on the subject.

The first volume of the transactions has already been issued, and the second volume will be issued this month.

Circular letters with a view to collating information are being prepared on matters affecting the rusting of steel, expansion and contraction, algebraical notation, the specification of dampness in concrete mixtures, etc.

It was originally intended to raise the annual subscription to two guineas per annum for new members at an early stage, but it has now been decided that the annual subscription of one guinea shall stand for new members who join this Institute before October next.

NEW L.C.C. REGULATIONS FOR CINEMATOGRAPHS.

The report of the Theatres and Music Halls Committee of the London County Council states:—

"We have for some time past had under consideration the revision of the regulations respecting the use of cinematograph lanterns, etc., in premises licensed by the Council and in this connection we have had the advantage of having had placed before us the views of the Kinematograph Manufacturers' Association of Great Britain and of the National Association of Cinematograph Operators. We have been able in the amended regulations to incorporate to a great extent the suggestions made by these associations, and we feel that if the Council adopts our proposals the danger attending cinematograph exhibitions will be further minimised without any unnecessary difficulties or restrictions being placed on the manufacturers and operators of the apparatus. The proposed new regulations have also been submitted to the Theatres Alliance and the Entertainments Protection Association, and no alterations have been suggested by these associations. In the statement (No. 1) separately submitted by us on April 6th, 1909, the effect on the existing regulations of the alterations suggested by us is clearly shown."

Statement (No. 1) is as follows:—

Regulations respecting the use of cinematograph apparatus, etc., in theatres and other premises licensed by the Council.

(1) No cinematograph, or other similar apparatus involving the use of a combustible film, shall be exhibited on premises licensed by the Council until the Council has been satisfied that all reasonable precautions have been taken against accident and danger to the public.

(2) Where cinematograph displays do not form a regular feature of the entertainment, notice of any intended exhibition shall be given to the clerk of the Council by the licensee of the premises in which such exhibition is to be given, and such notice shall be given at least three days before the exhibition takes place. Opportunity shall also be afforded to the Council's inspector of inspecting the apparatus at least four hours before the public exhibition takes place, in order to allow time for any necessary alterations to be carried out and approved by the Council's inspector.

(3) In no circumstances shall a cinematograph chamber be placed so as to interfere with the free use of an exit-way, and any temporary alteration in the regular line of a gangway must be amply compensated for by the rearrangement or removal of seats.

(4) Where cinematograph displays form a regular feature of the entertainment the apparatus shall be placed in a permanent enclosure of sufficient dimensions to allow the operator to work freely. Such enclosure shall be constructed of solid incombustible materials not less than 3 inches thick, and be provided with a proper ventilating trunk carried from the highest point of the interior of the enclosure to the outside air. The entrance to the enclosure shall be fitted with a self-closing fire-resisting and smoke-proof door placed at the rear, or on the operating side, of the apparatus and opening outwards.

Where cinematograph displays are occasionally included in the programme the lantern shall, if a permanent enclosure be not available, be contained in a smoke-proof box constructed of sheet iron on substantial frame-work and fastened together securely. The box shall be of sufficient dimensions to allow the operator to work freely, and the floor shall, if boarded, be covered with asbestos or other fire-resisting material. Such enclosure shall, wherever practicable, be ventilated direct to the outside air, and the entrance door thereto shall be self-closing and smoke-proof.

Openings not larger than is necessary for effective projection, and not exceeding in number two for each lantern, shall be permitted in the front face of the enclosure. The openings shall be fitted with a fire-resisting screen or screens, which, on being released from either the inside or the outside of the enclosure, shall close automatically with a smoke-proof joint.

The necessary pipes, electric cables, etc., shall enter the enclosure through properly bushed openings.

(5) The lantern shall be placed on firm supports of fire-resisting construction. The lamp or jet shall stand on an iron tray, with a vertical edge at least 1 inch in depth. The lantern shall be provided with a metal shutter which can be readily inserted between the source of light and the film gate.

The film gate shall be of massive construction, and provided with ample heat radiating surface, and the passage for the film shall be sufficiently narrow to prevent flame travelling upwards or downwards from the light opening.

(6) Where possible the electric arc light shall be adopted as the illuminant, the Council's regulations for securing safety in the electrical installation being observed. Circuits, in which there is a pressure exceeding 250 volts between the poles or from either pole to earth, shall not be allowed in connection with the apparatus. Where the apparatus is used in a portable box a permanently installed circuit shall be carried to a convenient point having regard to the usual position of the apparatus. Resistance shall be fixed in approved positions, and, where practicable, outside the enclosure. A small resistance for regulating purposes will, if desired, be allowed within the enclosure, but such resistance shall be fixed above the level of, and behind, the lantern.

All live terminals and fittings shall, as far as practicable, be protected so as to minimise the risk of short circuit or shock. Suitable fuses shall be provided at each pole for the main circuit, and for each of the sub-circuits, *e.g.*, the sub-circuits for pilot lights.

If limelight be used in the lantern the general regulations for its safety, which are issued by the Council, shall be complied with, special attention being given to the tubing, which shall be of sufficient strength to resist pressure from without, and shall be properly connected up. Ether and other inflammable liquids shall not be employed under any circumstances for producing light.

(7) All cinematograph projectors shall be fitted with two metal film boxes of substantial construction, and not more than 12 inches in diameter, inside measurement, to and from which the film shall travel. Such boxes shall be made to close in a manner which will prevent the ingress of fire, and shall be fitted with a film slot capable of preventing the passage of flame to the interior of the film box. Gearing should be used in preference to flexible belts for driving the "take up" spool.

All films when not in the machine, and while still in the operating enclosure, shall be contained in such closed metal boxes.

(8) (*a*) Smoking within the enclosure shall be forbidden at all times.
(*b*) Storage of any description shall not be permitted within the enclosure.
(*c*) Adequate small fire appliances, including a bucket of sand, shall be kept available outside the enclosure, and be in the charge of a special attendant.
(*d*) The general lighting of the hall and exits shall not be controlled solely from within the operating enclosure.
(*e*) A suitable barrier shall be placed round the temporary box to prevent the audience coming into contact therewith.

(9) The licensee shall be held responsible for seeing that the Council's regulations are complied with in every respect, and for the employment of competent, experienced, and trustworthy operators, and shall be prepared at any time to supply to the Council satisfactory credentials in this respect.

(10) The Council reserves to itself the right of requiring the adoption of any further precautions, in addition to those specified above, as circumstances may require.

STEEL FRAME BUILDING ENCASED IN CONCRETE.

Cleveland, O.—What is claimed to be a distinctly improved type of reinforced concrete construction is being used in the erection of the new 500,000 dollar Sterling Welch store building at Cleveland. The building is 84ft. by 500ft., with a wing 115ft. deep. It is five stories high, with a basement.

The reinforced steel frame of the building was designed by the Osborn Engineering Co., consulting engineers for the architects, Messrs. Milton Dyer and F. G. Bates. The building is roofed now, and remarkable progress has been made on account of the peculiar form of frame construction.

This is a combination of structural steel and reinforced concrete. It differs from the usual type of structural steel in that the steel frame is very light, and is designed to carry only a part of the load, while the fireproofing protection of concrete is made to carry its share all loads. It also differs in that the structural steel is first erected, and acts as a support for the concrete forms. It has all

EXTENSIONS AT HELES SCHOOLS, EXETER. WARE AND SONS, ARCHITECTS.

Expanded steel concrete flooring and steelwork encasing throughout.

the merits, it is claimed, of both steel construction and reinforced concrete construction, without the defects of either. Although it costs more than the usual form of work, the speed with which the work can proceed is much in its favour. The system has been used in one form or another in some eastern cities. The columns are made of eight light angles running continuously from the foundation to the roof. The floor girders and beams are made of light angles placed at the bottom and top of the girders and laced together by bars. These columns and girders are encased in concrete, the floor slab of reinforced concrete being laid at the same time as the concrete for the columns and girders is poured.

The angles and lacing of columns and girders permit the concrete to become thoroughly attached to the steel work. The steel is set exactly where it should go, and on account of each section of column and each section of girder being assembled at the bridge shop, the steel must come at the exact and proper place in the encased concrete, a somewhat difficult thing to accomplish always in the ordinary way of pouring concrete and inserting reinforcing rods. The girders and beams are riveted to the columns, making the connections absolutely rigid.

One great benefit claimed for this system is the speed with which construction work can proceed. The steel frame can be erected and concrete poured on all floors at once if desired.

THE CORROSION OF STEEL REINFORCEMENT IN CONCRETE.

By Ernest R. Matthews, A.M.Inst.C.E., F.R.S.E.

Abstract of a paper read on April 5th at a meeting of the Society of Engineers, at the Royal United Service Institute.

An Erroneous Impression.

It has been said that reinforced concrete should be avoided, as it is a treacherous material to use, owing to the fact that the metal corrodes, and being covered by the concrete the extent of the corrosion can never be ascertained, and therefore many well-known engineers up to the present have avoided the use of the material owing to this impression. If they were right in their assumption, and the steel did corrode, and there was no remedy for it, then reinforced concrete would soon have had its day, for its weakness in this respect would become generally known, and it would naturally be avoided; but, from a series of experiments which the author has recently made, and which he describes in this paper, he is in a position to state definitely that no such fears need be entertained. Before describing his own experiments, he would in a few words set forth the gist of the information which we already have in relation to this important matter. In America the subject has received a good deal of consideration, and the commonly accepted theory in the United States respecting corrosion of iron in concrete is that stated by Professor S. B. Newbury, which is as follows:—

How Rust is Formed, and Why Concrete Prevents It.

"The rusting of iron consists in oxidation of the metal to the condition of hydrated oxide. It does not take place at ordinary temperatures in dry air, or in moist air free from carbonic oxide. The combined action of moisture and carbonic acid is necessary. Ferrous carbonate is first formed; this is at once oxidised to ferric oxide, and the liberated carbon dioxide acts on a fresh portion of metal. Once started, the corrosion proceeds rapidly, perhaps on account of galvanic action between the oxide and the metal. Water holding carbonic acid in solution, if free from oxygen, soon acts as an acid, and rapidly attacks iron. In limewater or soda solution the metal remains bright. The action of cement in preventing rust is now apparent. Portland cement contains about 63 per cent. lime. By the action of water it is converted into a crystalline mass of hydrated calcium silicate and calcium hydrate. In hardening it rapidly absorbs carbonic acid, and becomes coated on the surface with a film of carbonate, cement mortar thus acting as an efficient protector of iron and preventing the carbonic acid molecules from attacking the metal. The action is, therefore, not due to the exclusion of the air; and even though the concrete be porous, and not in contact with the metal at all points, it will still filter out and neutralise the acid, and prevent its corrosive effect."

Some Very Important Tests

have been carried out by Professor C. L. Norton, of the Massachusetts Institute of Technology, Boston. These were conducted on the following lines. The blocks were made of:—(*a*) Neat Portland cement; (*b*) 1 part cement and 3 parts sand; (*c*) 1 part cement and 5 parts broken stone; (*d*) 1 part cement and 7 parts well washed cinders. The reinforcement of each block consisted of a ¼in. rod, a piece of soft steel, 6in. by 1in. by 1-16in., and a 6in. by 1in. piece of expanded metal. The tests were as follows: One-fourth of the blocks were allowed to remain in air inside a building. One-fourth were placed in a sealed box in an atmosphere of air and steam. One-fourth in a sealed box in an atmosphere of air and carbon dioxide. One-fourth in a sealed box containing an atmosphere of steam, air, and carbon dioxide. Some of the reinforcement was dipped in cement grout previous to insertion in the concrete, but in other cases it was not.

The results of these experiments led Prof. Norton to the following conclusions:—(1) That neat Portland cement, even in thin layers, is an effective preventative of rusting. (2) Concrete, to be effective in preventing rusting, must be dense and without voids and cracks. It should be mixed quite wet, when applied to the metal. (3) The corrosion found in cinder concrete is mainly due to the iron oxide, or rust, in the cinders and not in the sulphur. (4) Cinder concrete, if free from voids and well rammed when wet, is about as effective as stone concrete in protecting steel. (5) It is of the utmost importance that the steel be clean when bedded in concrete. Scraping, pickling, a sand-blast, and lime should be used, if necessary, to have the metal clean when built into the wall. These tests extended over a period only of three weeks, which, in the author's opinion, was not long enough. For years past French engineers have protected many of their iron bridges by coating them with cement wash, two coats being usually applied, and in America cement wash has been largely used for a similar purpose. M. Breuille, of France, states that from his experiments he came to the conclusion that in all cases the action of the cement in the concrete on the iron reinforcement prevented rust, and that it even removed the rust from iron which was already rusty when embedded in the concrete.

The question of

The Rusting of Steel in Concrete

has received the attention of German engineers, and numerous tests have been made, the general conclusion arrived at being that cracks occurring in the concrete do not result in the reinforcement becoming corroded at these points. The method of testing was briefly as follows:—Beams were prepared which were reinforced by the steel which is generally used in reinforced concrete structures, this steel being placed 1¼in. above the bottom of the beams. The concrete was mixed in the following proportions:—1:2:4, 10.1 per cent. of water being added. The forms were removed after a set of 24 hours; the beams were then stored for three months, some in wet sand, others in the open air, water being poured over them daily. For the next three months the beams were subjected to load tests, and of 58 beams made 26 were broken under these tests. The 32 beams which had not been broken were then subjected to a rusting test under a load, sheet iron casing being fixed around the middle third of the beam, through which a mixture of carbon dioxide, oxygen and water vapour passed. The beams were kept in this rusting atmosphere for three days from 7 a.m. to 4 p.m. The steel was then examined with the following result:—

In 27 out of the 32 cases no rusting had occurred. These 27 beams had been subjected to a load causing stresses of 18,000lb. to 35,000lb. per square inch in the steel, and the five remaining beams had been subjected to a greater stress, viz., 35,000lb. to 44,000lb. per square inch.

Mr. J. M. Braxton, assistant engineer at Key West, Florida, U.S.A., recently reported to the engineer officer in charge of the fortification works on the East Coast of Florida that he had made 15 sets of two blocks each, the aggregate in five of these sets consisting of three parts of coral sand, common to the beaches of the Florida Coast, and five parts of bricks crushed to pass through a 1in. ring: in five others it consisted of three parts of coral sand to five parts of brick crushed to pass through a 2in. ring, and in the remaining five blocks it consisted of three parts of silica sand and five parts of brick crushed to pass through a 1in. ring. The blocks were 12in. by 12in. by 6in. The reinforcement, which in each case was inserted in the middle of the blocks, consisted of twisted steel rods 8in. long and ⅝in. diameter. Some of the rods were dipped in grout, and others were not treated in any way. Half of these blocks were placed in the ocean after a 24 hours' set, and half were exposed to the air. At the expiration of a period of one year and 21 days, these blocks were broken, and it is interesting to note that the rods in those blocks which had remained in the sea water showed no signs of rusting, but those which had remained in air showed very slight rusting, regardless of the aggregate of which the blocks were made.

Some London Experiments.

Some interesting tests were carried out a short time ago at the National Physical Laboratory, London, at the request of Sir John Brunner, and the following is the official report of these experiments:—"A strong wooden box was made and divided into five partitions, each partition being 12in. long, 7½in. wide, and 7½in. deep. Specimens of mild steel of the following dimensions were prepared: (1) One inch diameter, 8in. long, turned all over. (2) Eight-inch lengths cut from 1½in. by 1½in. bar with the scale left on. The partitions were half-filled with good Portland cement concrete, and a specimen of each kind of steel laid on the top, the partitions being then completely filled with concrete. This was done on December 21st, 1906. The blocks were covered with water several times per week for a year, and for three months afterwards they were left in the open exposed to the weather. On April 20th one of the blocks was removed from the box and broken up, and the specimens removed. On examining the specimens carefully no trace of any action by the cement could be detected. The turned specimen was practically as bright as when it was put in, and the scale on the rough specimen was undisturbed. To test the possibility of any slight action, the surface of the turned specimen was polished and etched and examined under the microscope side by side with a specimen of the same material cut from the centre of the bar. No difference in the microstructure of the two specimens could be detected, and the conclusion is that in 16 months no action has taken place between the metal and the concrete."

While the preceding information is undoubtedly valuable, it will be readily seen that the results of the investigations vary considerably.

Influence of Aggregate, Water, and Air.

Prof. C. L. Norton found that corrosion took place when cinders were used as the aggregate of the blocks made by him; he also informs us that to dip the metal in cement grout was a sure proof against corrosion, but the metal must be clean before being dipped. This opinion is practically the same as that expressed by Prof. S. B. Newbury. M. Breuille, of France, found that no corrosion took place when steel was inserted in concrete, but that the reverse occurred. He put rusty bars into concrete blocks, and when these blocks were broken some time after, the bars were found to be quite bright. Mr. J. M. Braxton, on the other hand, found that slight rusting occurred when the blocks were placed in air, and that when submerged in sea water no corrosion of the metal occurred, while Sir John Brunner's tests indicate that no corrosion takes place when the blocks are placed in water and air alternately. In the German tests no corrosion occurred when reinforced beams were placed in air and others in wet sand, and afterwards subjected to a test load applied to produce a stress in the steel which did not exceed its elastic limit.

The R.I.B.A. Conclusions.

The report of the special Committee appointed by the Royal Institute of British Architects respecting this important matter should here be quoted. Their report, after dealing with other characteristics of reinforced concrete, goes on to say:—"It is sometimes thought that the metal may perish, but all experience shows that concrete is the best preservative for iron or steel known to us. A bar of iron or steel, slightly rusty, embedded in properly made concrete, may be taken out after some months, or after hundreds of years, brighter than when it was put in. Perhaps I may quote an instance (says Mr. W. J. Locke, then Secretary R.I.B.A.); the experience of Mr. Somers Clarke, formerly Surveyor to St. Paul's Cathedral, who, being anxious as to the condition of the great chain tie which binds the dome at its base, caused an opening to be made in the concrete in which it has been embedded for over two hundred years, and found the iron bright and perfect, notwithstanding the fears which had naturally been felt because of the percolation of water from the gallery over it. This is but one of many examples, showing not only that metal reinforcements and concrete have been used by architects for many years back, but that their confidence in the durability of concrete and metal in combination is justified.

The many instances of

Anchor Chains of Suspension Bridges

being embedded in concrete as a provision against their deterioration through the action of moisture may also be cited as showing the reliance placed on concrete by engineers for the protection of steel from corrosion."

The author, about 2½ years ago, had occasion to pull down part of a concrete sea wall at Bridlington which had been built 25 years previously, and he found that the iron chains which had been inserted in this wall at the time of its construction were still in a perfect condition; there being no sign of rust in spite of the fact that the sea covered the lower portion of the wall at every tide, and that in some places the chains were within an inch of the outside face of the wall.

The Author's Experiments.

The author then described the experiments recently made by him. He set himself the task of discovering something definite on 14 points, which are as follows:—(1) The effect upon the steel reinforcement of submerging blocks in 3ft. of fresh water, seven days after making them, and keeping the blocks in water for eleven weeks. (Steel untreated.) (2) The effect upon the steel of submerging blocks in 3ft. of fresh water after a 48 hours' set, and keeping the blocks in water for 11 weeks and 5 days. (Steel untreated.) (3) The effect upon the steel when the blocks are kept exposed to the air for 12 weeks. (Steel untreated.) (4) As No. 1, but when the steel is first dipped in cement grout. (5) As No. 2, but when the steel is first dipped in cement grout. (6) As No. 1, but when the steel is first dipped in linseed oil. (7) As No. 2, but when the steel is first dipped in linseed oil. (8) As No. 1, but when the steel is first dipped in turps. (9) As No. 2, but when the steel is first dipped in turps. (10) The effect upon the steel of keeping blocks, after a seven days' set, in water and air for alternate weeks for 11 weeks. (Steel untreated.) (11) The effect upon the steel of keeping blocks in water and air for alternate weeks for 11 weeks and 5 days after a 48 hours' set. (12) The effect upon rusty steel when the blocks are submerged in water for 11 weeks after a seven days' set. (13) The effect upon rusty steel when the block is submerged in water for 11 weeks and 5 days after a 48 hours' set. (14) As No. 13, but exposed to the air for 12 weeks.

The author had 20 concrete blocks made, formed of various aggregates, each being 8in. cube. In some instances the aggregate consisted of:—4 parts broken bricks, 2 parts sand, 1 part Portland cement. In other instances the proportions were:—3 parts ¾in. gauge slag, 1 part ⅛in. and dust slag, 1 part sand, 1 part Portland cement; also:—2 parts ¾in. gauge slag, 1 part ⅛in. and dust slag, 1 part coke breeze, 1 part Portland cement; also:—2 parts broken stone, 2 parts ¾in. slag, 1 part sand, 1 part Portland cement; also:—3 parts slag, 2 parts sand, 1 part Portland cement.

The analysis of the cement used was as given below:—

CHEMICAL ANALYSIS.

	Per cent.
Insoluble residue	0.82
Silica	20.43
Alumina	9.10
Oxide of iron	1.95
Lime	62.65
Magnesia	1.25
Sulphuric anhydride	1.38
Loss on ignition	1.66
Alkalies and loss	0.76
	100.00

The metal inserted also varied; in some cases it was put in in a rusty condition, in other cases it was clean. Some pieces of steel were dipped in cement grout, others in linseed oil, and others in turps.

The Author's Conclusions.

No absolutely bright steel was used by the author in these experiments, and the concrete used in these blocks was in no way specially prepared; in fact, in some cases it was rather carelessly done, with a purpose, namely, to make the test more severe. The results of his experiments have led the author to the following conclusions:—(1) That rusty steel embedded in concrete will in a very short time become bright, regardless of whether the concrete is in water or air. This point has, in the author's opinion, been conclusively proved by his experiments. (2) That the application of cement grout to steel is an effectual safeguard against corrosion, but that the greatest care should be taken in the grouting process to see that every portion of the steel is well coated, and that before the steel is embedded in the concrete the cement grout is allowed to become quite dry upon the steel. (3) That if the aggregate used for the concrete is not porous and the concrete is well mixed, the reinforcement being well embedded, no cement coating is needed. (Seeing that the application of a coat of cement grout is such an inexpensive procedure, the author makes it a rule in carrying out work of this kind to have all reinforcement coated in this manner.) (4) That no porous materials, such as coke breeze or slag, should be used in connection with reinforced concrete work, if such concrete is intended to be under water or exposed to the air. (5) That linseed oil or turps, or probably any other coating except cement or lime, applied to steel before its insertion in concrete facilitates rather than prevents the rusting of the metal. (6) That it is of great importance to see that the reinforcing steel is well embedded in the concrete, so that every portion of it is covered with cement. (7) That the best results were obtained when the aggregate consisted chiefly of broken stone or brick bats. Gravel would no doubt answer as well. The author was surprised that such a good result was obtained with an aggregate composed of brick bats. (8) That river sand, generally speaking, is not satisfactory for reinforced concrete work, where such work is required to be water-tight.

The author ventures to think that the conclusions which he has arrived at are of great importance, and should ease the minds of those engineers who up to the present time have had considerable doubt regarding this matter; he also hopes that the attention of the Local Government Board will be drawn to these experiments, and the conclusions arrived at, and that this will result in the period for repayment of loans for work of this class being considerably extended.

BLACKLER'S STORES, LIVERPOOL.

This is one of the largest stores in Liverpool, comprising over 11,000 square yards of reinforced concrete flooring. Indented steel bars were used throughout, of 1/3in. and ½in. diameter. The ground floor carries a load of 2cwt. per square foot, and consists of a 5in. slab, reinforced with ½in. bars spaced in accordance with the length of

BLACKLER'S STORES, LIVERPOOL: W. AUBREY THOMAS, ARCHITECT.

span. The average span is 9ft. On the first floor there is a projection of some 3ft.—built entirely in reinforced concrete—carrying the heavy cornice of the building. It should be interesting to note that, although at one time the floors were overloaded in many parts, no sign of deflection or any weakness was to be found. The structure was erected complete in record time—about ten weeks. The architect for the work was Mr. W. Aubrey Thomas, of Liverpool, and the contractors were Messrs. Henry Johnson and Sons, also of Liverpool.

THE LONDON COUNTY COUNCIL.

Loans.

The London County Council, at their meeting on Tuesday, April 6th, approved loans to the following:—

Islington Guardians: £2,075, for land and purposes to be appropriated as a home for children.

Stepney Borough Council: £1,500, for electric lighting, house services.

Tenders.

The following tenders were recommended for acceptance by the General Purposes Committee:—

J. Mowlem and Co., Ltd., for engineering jobbing works, for a period of three years.

Kemp, Durrant and Co., for the execution of hoarding, shoring, and other works in connection with property on improvement and other schemes, for a period of three years.

The following tenders were recommended for acceptance by the Education Committee:—

Galbraith Brothers, Ltd., 46, Camberwell Green, £10,117 6s., for the erection, on the Hitherfield Road site, Wandsworth, of a school for 370 children.

F. and T. Thorne, Isle of Dogs, £1,936, for the enlargement of the playground of the British Street School, Poplar, and the erection of a house for the schoolkeeper.

E. Lawrance and Sons, Wharf Road, City Road, £1,563, for the erection of a manual training centre, for 40 boys, at the Woolmore Street School, Poplar.

The following tenders were recommended for acceptance by the Highways Committee:—

Thomas and Edge, Woolwich, S.E., £3,326, for the construction of a new embankment wall at the river frontage of the Tramways permanent-way depot, Greenwich Road, Deptford.

S. W. Francis and Co., Gray's Inn Road (second lowest), for four steel rolling shutters for the paint shop at the Holloway Car Shed.

The New County Hall.

The London County Council agenda for April 6th Establishment Committee's report states that, "in the process of working on the drawings the selected architect, Mr. Ralph Knott, has come to the conclusion that he can greatly improve the appearance of the centre portion of the river-front by a modification of the approved design. We have had the advantage of hearing the opinion of the assessors in the competition, who have most generously advised us in the matter. There are one or two criticisms on which they lay stress, which we have reserved for further consideration at a later stage. These opinions do not, in our opinion, seriously affect the main lines of the composition, and in all other respects, Mr. Knott's design as now submitted has the general approval of the assessors. As a result, we have no hesitation in asking the Council to agree to the proposed modification. We have caused both designs to be placed on view in the members' lobby."

The Establishment Committee recommend for acceptance the tender of F. and H. F. Higgs, of Station Works, Loughborough Junction, S.E., £46,900, for the construction of the raft foundation and retaining walls in connection with the new County Hall.

New Buildings.

The Building Act Committee of the London County Council has given consent for the following buildings:—

Clapham.—Nurses' home for the Wandsworth Union Infirmary, on the application of Mr. J. S. Gibson.

Whitechapel.—Buildings on the eastern side of Hope Street, on the application of Mr. A. Davis, on behalf of the Osborn Estate and Mrs. H. Davis.

Strand.—Erection of a building on the south-western side of Catherine Street, to abut also upon the northern side of Exeter Street, on the application of Mr. G. H. Fox, on behalf of Mr. T. Pocklington.

Bow and Bromley.—Two buildings on the northern side of Blondin Street, Old Ford, on the application of Mr. F. R. Hasluck, on behalf of Mr. J. Pedley.

Marylebone, East.—Erection of two cooling towers at the Grove Road generating station, on the application of Messrs. Kennedy and Jenkin, on behalf of the Central Electric Supply Co., Ltd.

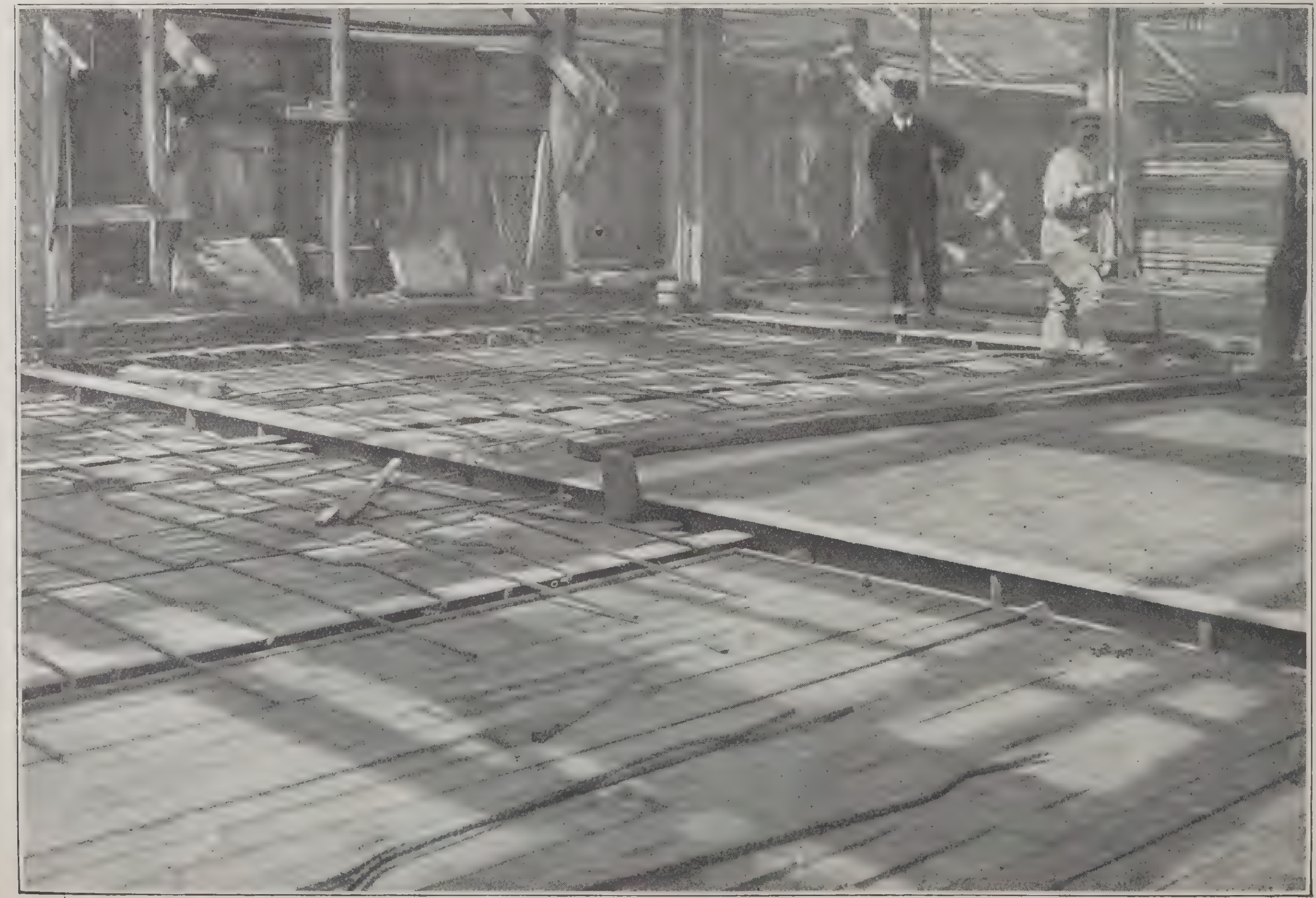
Bermondsey.—Additional premises for E. Lazenby and Son, Ltd., Crimscott Street, on the application of Mr. W. Downs, on behalf of Messrs. E. Lazenby and Son, Ltd.

Chelsea.—Ice factory at Kensal Wharf, Harrow Road, on the application of Mr. H. P. Drew, on behalf of Carlo Gatti, Stevenson and Slaters, Ltd.

Greenwich.—Addition to the premises, Blackwall Lane, of the applicants, The Delta Metal Co.

A CONCRETE TOWN.

The new town of Concrete, near Washington, claims to be the first wholly fireproof town in the world. Lots are sold with the proviso that the buildings thereon must be of concrete.



BLACKLER'S STORES, LIVERPOOL, SHOWING FLOOR CONSTRUCTION. W. AUBREY THOMAS, ARCHITECT.
Indented Bar Reinforcement. Henry Johnson and Sons, Contractors.

HARD WOODS AND FIRE RESISTANCE.

(Concluded from p. 151, No. 732.)

Tests Series "C."

The stair-treads of both woods mentioned at the commencement served for this series of tests. Whilst the series of tests "A" serve, to a certain extent, as preliminary experiments, and it was endeavoured to ascertain in tests "B" the greater or smaller inflammability of both kinds of wood, the series of tests "C" were intended to answer the following question:—Which of the two woods would, in the case of a continuous fire, prove of use for the longest time, when constructed as staircases—that is to say, which would possess the greater carrying power if extreme heat were applied to the same for any length of time?

In order to conform as nearly as possible to every-day practice, it would, of course, have been best to have had a staircase in extenso; but it was impossible to make arrangements for this, excepting with great difficulty. Even the tests undertaken with stair-treads 10 cm. wide demanded so great a time that they could not have been carried out on a much larger scale. Therefore, the pieces of wood still available from the lengths already used were trimmed up and planed, whereby the following dimensions were obtained:—1.0 m., 0.48 m., and 0.04 m.

The number of tests which were thus doubled afforded a greater safety against accidents. Each pair of stair-treads of the two kinds of wood were stood up horizontally against a firm brick wall, with its ends of 12 cm. length, so that the breadth of the span between the pair was 76 cm. Thereupon one of the two burners already mentioned in the series of tests "A" was applied underneath the wood (these burners had been so arranged as to give off equal heating power for a given height); and it was then so fixed with solder and rod, that it came exactly in the middle of the wood, and the under surface of the wood was set to the height over the burner for which the two burners had been regulated.

A suitable structure of brick was then fixed to both sides of each burner at a suitable distance, and extending well over the burners, so that if at a later time the wood collapsed, this structure could receive the weight of the wood, and so protect the burners, which were necessary for the continuation of the tests. Furthermore, in order to guard against any inequality in the heating power of the two burners, they were changed about (as was the case in the series of tests "A") in such a manner that the burner used for the oak in one case was used for the beech the next time, etc., etc.

At the commencement of each experiment, both burners, which, as indicated, were fixed one under the oak, the other under the beech, were lighted at the same time, and the time noted. It was then noticed how long a time elapsed before the woods showed any weakness in their carrying capacities when under the influence of the fire, and of a certain load being applied, the load in both cases being equal. "The load" took the form of a bundle of bricks fastened together with wire, to which had been attached a handle, the weight being 11.6 kg. At the first of these tests with the 10 cm. wide stair-treads (not shown in the table), the heating and burning took place with the load on. The same was left on the woods until the moment of breaking.

In the case of the remaining tests (and in order to protect the burners), the heating up was always done without the weight being on; and then, from time to time (the intervals being shorter and shorter, at last being only minute intervals), the load was laid on until the breaking point was reached.

The tests are shown in Table IV. The oak broke earlier than the beech five times out of twenty cases; in three cases they broke at exactly the same time, and in twelve cases the oak broke later. On the whole, the durability of the oak was greater than that of the beech.

The charring extended further in the case of the beech than in that of the oak, as was also shown in the series of tests "A."

It would not be right, in the case of the material here experimented upon, to take it that, generally speaking, the oak possesses greater carrying powers. The time at which the oak broke varied very much, viz., from 17 to 43 minutes, showing a difference of 26 minutes, whilst in the case of the beech the limits were from 21 to 30 minutes, showing a difference of only 9 minutes (Table IV. "B"); and it is here that, in our opinion, the difficulty of these tests arises. In order to arrive at a more correct opinion, it is necessary to study more closely the quality of the woods used.

TABLE IV.

No.	Wood used.	Year rings. MM.	Specific weight.	Quality of Wood.	Breaking point. Beech-Oak Minutes.	Partial charring Beech-Oak MM.	Uncharred remained Beech-Oak MM.
1	Oak	1.4	—	Oak, narrow-ringed, bu rich in substances	41	126	15
	Beech	1.4	—	Ditto, white	27	153	13.5
2	Oak	2.4	—	Hard, fairly-rich in substances	36	132	14
	Beech	4.4	—	White	30	170	13
3	Oak	2.5	—	Fairly mild	43	140	11
	Beech	2.9	—	White	27	170	12
4	Oak	1.5	—	Mild	29	160	18
	Beech	2.9	—	White	27	155	13
5	Oak	2.0	—	Tolerably rich in substances	27	105	20
	Beech	2.0	—	White; year rings from 1.7 to 3 mm.	27	180	15
6	Oak	0.6	—	Very narrow ringed speckled	22	150	21
	Beech	2.5	—	White	28	150	12
7	Oak	0.6	0.45	As No. 6	17	170	25
	Beech	1.4	0.62	White	21	204	16
8	Oak	1.7	0.59	Narrow ringed; poor in substance	23	140	25
	Beech	2.2	0.64	White	23	140	12
9	Oak	3.0	0.70	Rich in substances ..	39	150	11
	Beech	2.0	0.69	Rather red on edges ..	28	180	11
10	Oak	3.3	0.71	Very rich in substances	35	160	15
	Beech	2.2	0.74	Quite red	26	150	12
11	Oak	1.5	0.57	Less rich in substances	27	170	19
	Beech	2.1	0.72	Half red	24	150	10
12	Oak	1.4	0.52	Slightly rich in substances	27	160	20
	Beech	2.1	0.73	Red	29	150	12
13	Oak	2.0	0.65	Fairly mild, but rich in substances	26	130	21
	Beech	2.4	0.58	One-third red; very soft	22	230	11
14	Oak	2.0	0.68	Like No. 13	26	130	21
	Beech	3.0	0.59	Quite red, very soft ..	23	165	15
15	Oak	3.0	0.65	Rich in substances; year rings thereon 1.7 to 4.5 mm.	27.5	130	15
	Beech	2.5	0.68	Red, horizontal cracks	28	165	12
16	Oak	2.7	0.64	Rich in substances ..	30	145	15
	Beech	2.0	0.65	Red, horizontal cracks, slightly blue	24.5	145	10
17	Oak	2.0	0.61	Mild, poor in substances	28	130	19
	Beech	4.0	0.59	A quarter red and uneven grain	24	175	10
18	Oak	2.0	0.57	As No. 17	29	140	16
	Beech	4.0	0.60	As No. 17	21	160	16
19	Oak	1.7	0.59	Narrow ringed, poor in substance	25.5	140	20
	Beech	4.2	0.66	Wide ringed, white, rotten at end	28	140	11
20	Oak	1.4	0.57	As No. 19	24	135	22
	Beech	4.2	0.65	As No. 19	24	135	12
				Total ..	**582 : 511,5**	**2823 : 3267**	**363 : 248,5**
				Average	**29,1 : 25,5**	**141,2 : 163,4**	**18,2 : 124**

(a) Tests with stair-treads of 100 cm. long, 4.8 cm. wide, and 4.0 cm. strength.
(b) Comparison of the breaking times:—

OAK.

No. 3. Highest breaking point, 43 minutes.
No. 7. Lowest breaking joint, 17 minutes—difference 26 minutes.

BEECH.

No. 2. Highest breaking point, 30 minutes.
Nos. 17 and 18. Lowest breaking point, 21 minutes—difference 9 minutes

The pieces under test ere not specially prepared for the purpose. They were drawn from a wood depot, where they had already been lying several years. They were intended for use in building, and can therefore, on the whole, be looked upon as the material which is generally used for building.

In the case of the oak we have narrow and broad-ringed pieces, mild and tough pieces, hard wood, and wood rich in substances. The year rings ranged from 0.6 to 3.3 m.; the specific weight was between 0.45 and 0.71; therefore only very heavy hard oaks were missing. The beech, in the main, came from a sandy and chalky soil.

Owing to the strong inclination of the beech taken from the first-named soil to split, a great part of this material had to be thrown out, but, on the whole, the pieces used for test can be looked upon as the average quality used for stair-treads. We have here quite white, red-striped, and quite red wood, with year rings of from 1.4 to 4.4 m. in breadth, and of the specific weight of from 0.58 to 0.74.

Whilst in the case of the oak, the difference that quality makes has a great influence on its breaking point, this makes practically no difference in the case of the beech; even a piece of wood which has lain in the forest for some time and is looked upon as poor material, does not seem to be influenced much so far as its carrying powers go. In order to make this clearer, Tables V., VI., and VII. show the times at which the woods broke according to their specific weight, colour, and year rings.

TABLE V.

Tests arrangement of the breaking points according to specific weight:—

Specific Weight. mm.	Oak Minutes.		Beech Minutes.	
0·45	17	Average 24·6 Min.		
0·52	27			
0·57	24, 27, 29			
0·58			22	Average 22·5 Min.
0·59	23, 25·5		23, 24	
0·60			21	
0·61	28	Average 30·2 Min.		
0·62			21	Average 25·2 Min.
0·63				
0·64	30		23	
0·65	26, 27·5		24, 24·5	
0·66			28	
0·67				
0·68	26		28	
0·69			28	
0·70	39			
0·71	35			
0·72			24	Average 26·3 Min.
0·73			29	
0·74			26	

TABLE VI.

Arrangement of breaking points according to year ring widths:—

Year Ring Width. mm.	Oak Minutes.		Beech Minutes.	
0·6	17, 22	Average 26·7 Min.		
1·4	24, 27, 41		27, 21	Aver. 24 Min.
1·5	27, 29			
1·7	23, 25·5	Average 29·3 Min.		
2·0	26, 26, 27, 28, 29		24·5, 27, 28	Average 25·9 Min.
2·1			24, 29	
2·2			23, 26	
2·4	36		22	
2·5	43		28, 28	
2·7	30	Average 32·9 Min.		
2·9			27, 27	Average 25·7 Min.
3·0	27·5, 39		23	
3·3	35			
4·0			21, 24	Average 25·2 Min.
4·2			24, 28	
4·4			30	

TABLE VII.

Arrangement of breaking points of the beech according to colour:—

	White.	Half-Red. Minutes.	Red.	
	27	28	26	28
	30	24	29	24
	27	22	23	
	27	24	28	
	27	21	24.5	
	28			
	21			
	23			
Together	210	119	130.5	52
Average	26.2	23.8	26.1	26.0

In the case of the oak, the carrying power is clearly dependent upon its weight and its age, and on the breadth of its year ring. In the case of the beech, the carrying power rises with the specific weight, whilst the breadth of the year ring does not influence it at all. Colour scarcely comes into account.

It should be specially pointed out that the light mild oaks fell far behind the beech in their carrying powers when the average was taken. The age of the pieces of wood under test was considered, our reason for this being that horizontally-standing pieces of wood must have a greater carrying power than those which are lying flat. The tests did not furnish any special data for judgment on this question.

According to the tests of Series C and the observations made in connection with them, the question as to the greater or lesser usefulness of the woods for staircase purposes in their relation to danger from fire would be answered as follows:—(1) Oak, which is tough, rich in substance, and heavy, is decidedly superior to beech. (2) Light oaks, which are mild and poor in substance, break sooner, on the whole, than the beech tested. They are, however, of less value than the latter. (3) Beech shows a greater evenness than oak, and it is, therefore, easier to judge of the usefulness of the wood for this purpose. (4) It is not possible in the case of any particular wood only to admit certain qualities of the wood—that is to say, mild, light oaks, cannot be absolutely excluded. It is not possible, speaking generally, to give the oak preference over the beech.

BRITISH FIRE PREVENTION COMMITTEE'S OFFICIAL TESTS.

High Pressure Tanks for Country Houses.

The tests under review deal with the efficiency of a fire tank, which was put before the British Fire Prevention Committee, and tested at their Regent's Park station, and in respect to which a report has now been issued. The illustration presented describes the appliance.

The idea under-lying the invention is that a high-pressure supply of water should be obtainable in premises where there is no water supply, or where the mains have not a sufficiently high pressure, as, for instance, in country houses.

The tanks are made to various sizes, or several tanks can be linked together. They come into operation automatically, but can be brought into action with the aid of a lever.

The actual appliance tested had a capacity of 125 gallons, and this appliance was subjected to a number of tests working, both in connection with an ordinary hydrant and hose and in connection with sprinklers.

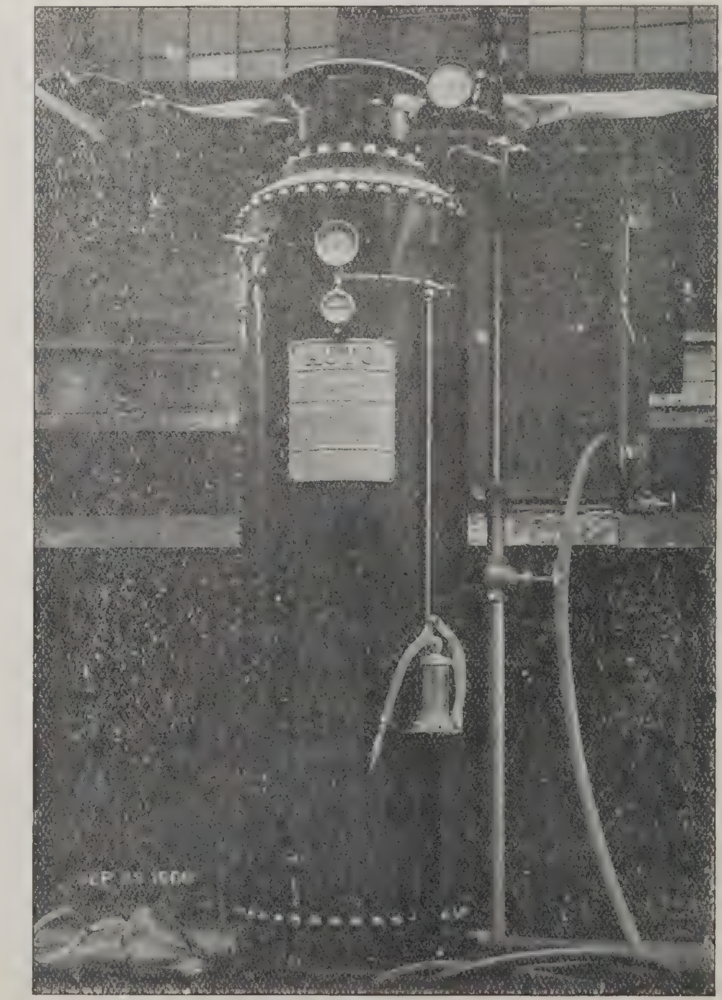
Summarised, the appliance appears to have had a considerable efficiency, but the discharge of the stream of water was much broken by gas bubbles. It certainly worked at very high pressures, and with considerable mechanical force, for instance, the possible discharge through the nozzle of the hose being 48ft., with a maximum of 65ft.

Architects having to specify precautionary measures in country houses, would do well to study the British Fire Prevention Committee's report, No. 131, in respect to this appliance, for it affords a considerable amount of useful technical detail.

The test itself, it should be added, was conducted under the usual procedure of the committee, Major General Festing, C.B., attending for the Council, Mr. Edwin O. Sachs, F.R.S.Ed., attending for the Executive, and there being a sub-committee directing the testing operations, which comprised Mr. Ellis Marsland, as directing member, with two fire brigade officers and an insurance surveyor, and Mr. Percy Collins, J.P., whose investigations on questions relating to the smaller extinguishers are so well known.

REINFORCED CONCRETE BUILDINGS IN TORONTO.

Two reinforced concrete buildings, says "The Financial Times," each 104ft. wide and 377ft. long, are being built at the stock-yards at Toronto, to replace structures destroyed by fire last summer. The new buildings are fireproof to exterior fires, the only timber used being in the roofs, which are covered with felt and gravel. The 14in. by 24in. columns are on about 15ft. to 16ft. centres, and the curtain walls, 8ft. high, are 6ins. thick. The windows are glazed with wire glass, and have metal frames." It is a pity that the roofs were not constructed of reinforced concrete also. We should hardly endorse the statement that they were fireproof to exterior fires, if the roofs are vulnerable.



HIGH PRESSURE TANKS FOR COUNTRY

Federation News.

SUNDERLAND AND DISTRICT ASSOCIATION.

Secretary: W. H. Hope, Solicitor.

At a meeting of the Executive Council of the Sunderland and District Association, held in the board-room, on March 2nd, the secretary reported that since the last donation was given to the Mayor's Distress Fund £2 6s. 6d. had been received from members. On the proposition of the president, seconded by Mr. W. B. Cooper, it was resolved:—"That the amount received be forwarded to the Mayor's Distress Fund in the name of the association."

The question of the second year's issue of the telephone directory was considered. It had been proposed that the association should issue a telephone directory, containing twelve flaps or leaves of thin cardboard enumerating the different trades, and also a list of the different professions, giving the names, addresses, telephone numbers, and telegraphic addresses. It was thought that this would be handier than the present large card (13in. by 21in.). The cost of the new proposal was considered to be too much, and that a card similar to last year's should be issued this year.

The secretary reported that formal notice of alteration to the working rules had been given to the bricklayers, from whom the following counter-proposals had been received:—(B) From November 8th until November 27th (both inclusive), all men shall start work at 7 a.m. and cease at 4.30 p.m., with 20 minutes for breakfast and 40 minutes for dinner, except on Saturdays, when work shall cease at 12 noon, with half-an-hour for breakfast (47 hours per week). (C) From November 28th until January 24th (both inclusive), all men shall start at 8 a.m. and cease work at 4.30 p.m., with half-an-hour for breakfast and one hour for dinner, except on Saturdays, when work shall cease at 12 noon (36½ hours per week). (D) From January 25th until February 13th (both inclusive), all men shall commence work at 7.30 a.m. and cease at 5 p.m., with half-an-hour for breakfast and one hour for dinner, except on Saturdays, when work shall cease at 12 noon (44 hours per week)." They also proposed alterations as to rules 5 and 12, and general rule as follows:—Rule (5) paragraph (2): "A lock-up shed with fire shall be provided for the sole use of the workmen, in which they can have their meals and store their tools when not in use." Rule (12): "These rules shall be binding on employers and operatives alike, and shall only be altered after the expiry of six months' notice, given between September 1st and February 14th. In the event of either employers or operatives giving notice on the last day of the term (February 14th), 14 days be allowed the other side in which they may send in a counter-notice." General alteration to Rule (2): "That from February 13th until November 7th an eight-hour day be worked on Monday, Tuesday, Wednesday, Thursday, and Friday, and four hours on Saturday (44 hours per week).

On the proposition of the president, seconded by Mr. W. B. Cooper, it was resolved:—"That the Executive Council now frame the hours of labour to be suggested to the operative bricklayers, and ask them to give them consideration: (B) From November 8th to November 20th (both inclusive), all men shall commence work at 7 a.m. and cease at 4.30 p.m. (instead of 5 p.m.), with half-an-hour for breakfast and one hour for dinner, except on Saturdays, when work shall cease at 12 noon, with the usual half-hour for breakfast, making a total of 44½ hours per week. (C) From November 21st until January 31st (both inclusive), all men shall commence work at 8 a.m. and cease work at 4 p.m., with no time allowed for breakfast and one hour for dinner, except on Saturdays, when work shall cease at 12 noon, making a total of 39 hours per week. (D) From February 1st until February 20th (both inclusive), all men shall commence work at 8 a.m. and cease work at 4.30 p.m., with no breakfast time and one hour for dinner, except on Saturdays, when work shall cease at 12 noon, making a total of 41½ hours per week." It was also decided that this amendment should apply to the joiners, and that formal notice should be given them accordingly.

The question of whether any amendments are necessary in the National form of contract was considered, and, on the motion of the president, seconded by Mr. W. B. Cooper, it was resolved:—"That a small sub-committee, consisting of the president, J. W. White, F. W. Ranken, W. B. Cooper, and the secretary, meet together to discuss the matter."

The report of the Conciliation Board meeting, held on January 20th, was received.

The following were elected members of the association:—T. H. Dunwoodie, builders' merchant; William Davison, builder.

SHEFFIELD ASSOCIATION.

Secretary: Thos. Smith.

The monthly meeting of the Sheffield Association was held on the 11th ult., when Mr. W. W. Mears (the president) presided over a large attendance of members.

Previous to the meeting the committee met a deputation from the Sheffield Master Plumbers' Association for the purpose of discussing the increasing tendency of the City Council to do plumbing and other work to the detriment of various branches of the building trade, or at least to the detriment of persons engaged in the trade. It is held that it is unfair on the part of the City Council to enter into competition with its own ratepayers, and it is evident from the attitude of both associations that any apology for the institution of a works department will be met with uncompromising opposition. The present agitation mainly arose out of a resolution of the City Council authorising any department to carry out independently any work, the value of which did not exceed £10. But, said Mr. Councillor Hobson, in introducing the deputation, work might be started which was estimated to cost £10, and it might subsequently be found that very much more was required, so that in the end the work might assume fairly large proportions. Mr. Biggin pointed out that the City Council, in taking over the old water company, took over a repair department. Mr. Corrie said that in 1898 a resolution was passed by the City Council that plumbing work should be carried out by the corporation's workmen at the cost of labour and material only, but this resolution was not put into effect until the works construction department was abolished. The final result was that officials were multiplied and gradually took on work "in order to keep the department employed," and a profit was shown as an apology for its existence, although such a profit was absolutely in contradiction to the resolution which led to its inception. It was eventually decided that both associations consider the matter separately, and subsequently meet again to decide on a joint action it would be deemed advisable to take.

At the monthly meeting a letter was read from the operatives' secretary of the local conciliation board, advising the association that at a meeting of the operatives' delegates resolutions had been passed protesting against the statement of the secretary of the association, conveyed in a letter to the town clerk, that it had always been a custom and was not denied that walking time was not paid when men were engaged and paid on the job. Further, the delegates claimed that they had never had an oppportunity of denying this, and they also passed a resolution protesting against a letter being written to the town clerk in reference to a fine of £24 which had been imposed on one of the association's members after the meeting of the conciliation board, which had been called to discuss the action of a section of the operatives in bringing the case to the notice of the City Council before reporting to the Master Builders' Association. The matter, however, led to no special discussion, as since it was written a trades committee of the conciliation board had met to consider the abolition of walking time, out of which the case had arisen.

A further letter was read from the secretary of one of the local bricklayers' societies, complaining that one of the association's members was starting men at 8 instead of 7 a.m. It was explained that short time was imperative in this case, and the other local bricklayers' society had agreed that it would not constitute an infringement of the rules if the men during the period of short time commenced at quarter-time, viz., 9 o'clock. This was satisfactory to the firm concerned, and, as a matter of fact, was their original suggestion, but the other bricklayers' society, who laid the complaint, had complained that it was out of order for one of their societies to settle a matter without the sanction of the other. This little quibble had, however, been satisfactorily adjusted, and the whole matter was now amicably settled.

A letter was read from the secretary of the Antwerp Master Builders' Association thankink the Association for its invitations for the Belgian builders to visit Sheffield. (Since the meeting a further communication has been received, saying that the return visit has been provisionally fixed for the second week in August.)

Mr. Sivil gave a report of the meetings of the Chamber of Commerce which he had attended as one of the representatives of this association, and reminded the meeting that members of the Master Builders' Association are now included in the committee for the consideration of the corporation new by-laws. Another important matter affecting builders which the Chamber had considered was that of railway rates, and it had been shown that goods could be brought cheaper from Germany than they could be sent from Liverpool. Mr. A. J. Forsdike referred to the experience of his own firm with the Midland Railway Co., in regard to rates for stone, and said the matter was one which demanded the early and close attention of the association.

The action of the Bridlington Association in regard to a Sheffield member who had given a quotation for slating at Bridlington in competition with a local firm, was considered. It was explained that the recipient of the quotation had been told by his association that he was liable to a penalty if he accepted the tender of an outside firm. It was thought that this was not what was intended by the inter-trading rule; but as the matter had been passed forward to the Yorkshire Federation for consideration, it was deemed advisable not to consider the matter further at the moment.

The question of the advisability of all members of the association being covered by insurance against their liability to third parties (the general public) was considered at some length, and the secretary presented quotations from several insurance companies. The policy of the association required was one which would cover a specified amount of damages for any one accident, but which would be limitless as to the number of accidents in the year, and a further condition which had been imposed was that any legal expenses should be covered by the policy over and above the amount stated in the policy. On these lines the quotations had been given, and after consideration it was resolved that the Ocean Accident and Essex and Suffolk Companies be recommended. The rates of the two companies varied somewhat, but their basis for £100 cover was the same, the differences arising in the main from individual amounts of wages.

A report was given by Mr. Biggin of the arrangements which had been made with the City Council and City Police in regard to the question of builders' hoardings, which formed the subject of a case in court, which has already been fully reported in the "Builders' Journal." They had been met very considerately by the Council, who had informed them that it was their intention to require a close-boarded hoarding in suburban positions where there was a minimum of traffic; but under section 34 of the Public Health Act, 1890, builders were required to put up a hoarding to the satisfaction of the City Council, and this they were quite prepared to do. It had been further agreed that in case of any difference of opinion in regard to a hoarding in any position, the City Council would be prepared to receive a deputation from the association to discuss the matter on its merits with the object of establishing a precedent for any similar position. Mr. Sivil said Mr. Biggin had given the result of their interview a somewhat rosy complexion, but the salient points were as he had put them, and the result of the interview had been most satisfactory to all parties concerned.

The suggested form of certificate to be given by workmen on entering employment under the provisions of the Workmen's Compensation Act was considered at the request of the Yorkshire Federation, but it was felt that at Sheffield at least the matter might be shelved for some little time, and the association felt inclined to see what other associations in the Federation proposed to do, before taking any definite action in the matter.

THE MASTER BUILDERS' ASSOCIATION OF NEW SOUTH WALES.

(*Concluded from p.* 312, *No* 739.)

Relations with Architects.

The committee have much pleasure in announcing that the relations between this association and the Institute of Architects have been so cordial and excellent in every way as they have ever been. There has been a slight increase in the demand for the association's conditions of contract, and no trouble has been experienced during the year in this connection. The most important matter included during the year was the final adoption by both bodies of the quantity system. It was near the half-year when this matter was finally concluded, and a booklet containing fullest information was published jointly by the Institute and the association. It took some little time to make architects outside the Institute fully acquainted with the matter, but everything is now working smoothly, and the introduction of the system has been advantageous to builders, architects, and their clients. The committee look forward to the time when the system will become universal for all contracts, large and small, Government and private. A deputation from the association waited on the Hon. C. A. Lee, Minister of Works, *re* the introduction of the quantity system into Government works, and was well received. Mr. Lee promised to give the system a trial on three or four large works for which tenders are shortly to be called.

With the first half of the year the old Industrial Arbitration Act expired by effluxion of time, and the Industrial Disputes Act, a measure providing for Wages Boards for different trades, with right of appeal to an Industrial Court, came into force. This Act met with a great deal of opposition from the Labour Council, and many of the unions, on account of its recognition of the rights of non-unionists, though a good number of unions have registered, and several disputes have been settled by the Boards. Partly through the opposition to the Act and partly through the increase of general prosperity in the State of recent years, a great deal of industrial unrest has been aroused, and strikes have occurred in many trades. So far there has not been much trouble in the building trades, but the unions in these trades have recently been organised into a federation, and it behoves all employers in the building trades to be on the *qui vive*, and to be strongly organised. Partly for this reason and partly with another object in view a sub-committee has been appointed to devise the best methods of increasing the membership of this association.

Early in the year the Painters' Union, failing to secure a conference with the Master Painters' Association to discuss their grievances, went out on strike. Neither side being very efficiently organised, the strike dragged on with little or no advantage to either side until the Painters' Union appealed to this association to mediate. Our members being keenly interested, either directly or indirectly, it was decided to hold a conference with the men, and invite the Master Painters' Association to join. This they refused, and conferences were held without them. An agreement was drawn up and submitted to the Master Painters' Strike Committee, but they refused to become a party to the agreement, and an appeal was made to the Arbitration Court. An award and common rule were granted, and the whole matter was settled in very quick time, thanks to the organisation of this association.

During this year the association has not been able to take an active interest in the apprentice question, but the advice of the association has been sought by associations in other States and by the Arbitration Court, and your committee trusts to be able to take another and more decided step forward early in the new year.

The association, by private subscription among the members during 1907, donated prizes to the principal classes connected with the building trade at the Technical College. These were presented at our own rooms during 1908, in the presence of representatives from the Technical College, Institute of Architects, and our own members.

With a view to popularising the idea, and continuing the prizes for future years, it has been decided to limit the amount of subscriptions, and it is hoped that every member will subscribe. A good response has been made so far, but as the account is not yet closed, the amount promised, some of which is in hand, does not appear in the balance-sheet.

The Royal Commission on Forestry, appointed in 1907, was sitting for nearly eighteen months, travelled over every possible part of the State, taking evidence and enquiring into all phases of the question. The Commission obtained evidence from this association, and sought our advice as to the suitability of certain timber grown in Australia, but not native to the country, and finally presented to Parliament a most valuable report, which contains every recommendation put forward by this association. The Government cannot be too strongly urged to take immediate action on the lines laid down in the report in order to prevent the threatened extinction of our local timber supplies.

Early in the year the Government appointed a Royal Commission to consider what steps should be taken to improve the city of Sydney and the means of access from the suburbs. The president of the association was appointed to a seat on the Commission, as a recognition of the status of the association in the practical business life of the State. The Commission has been sitting continuously for nine months, and still has a great deal of hard work before it can present its report, but it is believed that when the report is presented, some valuable and sound projects will be brought forward and promptly acted upon.

The report is signed by Mr. James Wall (president) and Mr. N. Phelps Richards (secretary).

The figure of Aristotle, by Mr. G. Walker, has recently been placed in the niche prepared for it outside the south wall of the residence. It is the gift of the Dean of Lincoln and Mrs. Wickham. The four niches outside St. Deinol's are intended for figures of those four great men who were regarded by Mr. Gladstone as his chief masters—Aristotle, St. Augustine, Dante, and Bishop Butler. Three are now in position, all of them the work of Mr. Walker.

Trade and Craft.

Johnson's Lattice System of Reinforced Concrete.

In Johnson's lattice system of reinforced concrete, as described and illustrated in a booklet that has been issued by Messrs. Richard Johnson, Clapham and Morris, Ltd., 24 and 26, Lever Street, Manchester, the reinforcement consists of lattice made from 3 to 13 gauge drawn-steel wire, which can be laid in lengths up to 200ft., thus forming a continuous bond for that distance. Wire of heavier gauge is laid in lengths up to 50ft., which may be lengthened by hooking any number of lengths together. In a building, say 200ft. long, the reinforcement is secured at the front and rear of the building, and is carried through the entire length without a break. In this system all reinforcement is on direct lines of tension. In fire-resisting floor construction it meets the requirements of strength, lightness, efficiency and reasonable cost, and methods of employing it in this class of construction are illustrated in the firm's booklet, and are particularly well shown in early stages of the construction of the floors of Transvaal University College, Johannesburg, South Africa, where 6,100 square yards of Johnson's lattice were used, and where every roll of the material arrived in perfect order after much handling and a journey of 7,000 miles; and in the floor of the club building of the Commercial Travellers' Association, New South Wales. The strength of the system is demonstrated very effectively by a view and a section showing its employment for the cover or deck of the conveyor subway, Dock No. 9, Manchester Ship Canal, where it carries heavy locomotives (44½ tons) and cranes, and withstands the impact of heavy goods unloaded from large steamers. The Johnson system has been also adopted for the deck of the railway pier at Ryde, Isle of Wight, for floor construction in the Savoy Hotel extensions, where 34,000 square yards were used; for the decking of the bridge over the Regent's Canal, Regent's Park, which was constructed by H.M. Office of Works; and in many other important buildings at home and abroad. Useful shipping measurements, and other particulars that are of special interest to transporters, are included in the booklet.

Coming Events.

Saturday, April 17.

NORTHERN POLYTECHNIC ARCHITECTURAL AND BUILDING STUDENTS' ASSOCIATION.—Visit to Lambeth Palace, 3.30 p.m.

BUILDING TRADES EXHIBITION AT OLYMPIA. Opening Day.

Saturday, April 17.

ARCHITECTURAL ASSOCIATION (18, Tufton Street, Westminster).—Visit to Building Trades Exhibition, Olympia, 3 p.m. Tea in the Pavilion (on the invitation of Mr. H. Greville Montgomery, M.P.), 5 p.m. Tickets to be obtained from the Secretary of the Association.

Monday, April 19.

ROYAL INSTITUTE OF BRITISH ARCHITECTS (9, Conduit Street, Hanover Square, W.).—Mr. W. E. Riley, F.R.I.B.A., Superintending Architect of Metropolitan Buildings, and Architect of the London County Council, on "The Architectural Work of the London County Council," 8 p.m.

INSTITUTION OF HEATING AND VENTILATING ENGINEERS (99, Fonthill Road, Finsbury Park, N.).—Last day for sending in hospital competition schemes.

Tuesday, April 20.

NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS.—Visit of members to the Building Trades Exhibition, Olympia, 5.30 p.m.

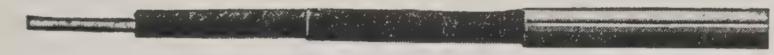
Friday, April 23.

SOCIETY OF ARCHITECTS (Staple Inn Buildings, E.C.).—Visit to the Building Trades Exhibition.—Dinner at the Trocadero Restaurant, 6.30 p.m.

THE
O-S WIRING SYSTEM.

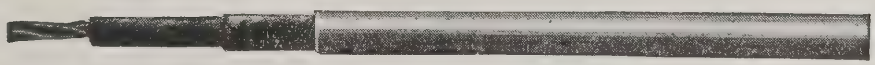
INEXPENSIVE. DURABLE. RELIABLE.

KUHLOS WIRE.



Brass-Cased, suitable for inexpensive surface wiring in dry interiors. Single or twin.

STANNOS WIRE.



Cased with tinned copper, and rendered homogeneous by a special process, suitable for inexpensive surface or concealed wiring in any position. Can be used as a concentric system, with a double wound Transformer or private plant, when it is cheaper than surface flexible.

"METACASE" CONDUCTORS
(PATENTED)

Semi-flexible.

Watertight.

Mechanically protected.

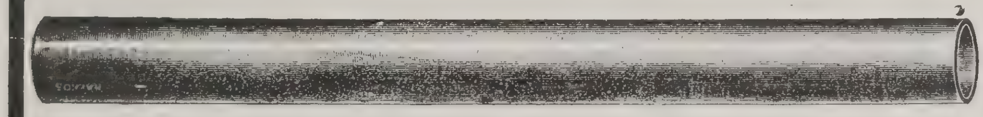
Perfect continuity with patent continuity fixture.

No condensation.

No bends or elbows.

Standard accessories.

KALKOS CONDUIT.



Tinned Brass Conduits and Fittings. Suitable for high-class draw-through surface or concealed wiring in any position. Can be used as a concentric system, and may be combined with Kuhlos or Stannos Wires.

KALKOS CONDUITS

Watertight.

Mechanically protected.

Perfect continuity.

No condensation.

APPLY FOR CATALOGUE No. 517.

SIEMENS BROTHERS & Co., LTD.,

Electrical Engineers.

CAXTON HOUSE, WESTMINSTER, LONDON, S.W.

TELEPHONE: Gerrard 860. TELEGRAMS: "Siemens, London."

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous. Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Braunton, Devon.—For erecting a house, stabling, and outbuildings, for Mr. J. Pickard. Mr. H. W. Weir, architect and surveyor, 32, Green close Road, Ilfracombe:—

Woolway and Son	£1,250	0	0
A. Darch	1,076	0	0
W. H. Robins	1,032	0	0
Lucker Bros.	999	15	0
Slee and Son,* Barnstaple ...	924	16	4

*Accepted.

Cleethorpes, Lincs.—For completion of building of an elementary school for infants at Cleethorpes, for the Lindsey County Council Education Committee. Messrs. Scorer and Gamble, architects, Bank Street Chambers, Lincoln:—

Sprakes and Son, Gate, Doncaster	£2,542	4	0
Halkes Bros., Lincoln	2,480	0	0
Parker and Son, Boston	2,450	0	0
D. Parks and Son, Grantham ...	2,450	0	0
H. J. Thompson, Scunthorpe, near Doncaster	2,324	0	0
G. W. Wainer, Nottingham ...	2,320	0	0
Pattinson, Ltd., Sleaford ...	2,295	0	0
W. Nicholson and Sons, Ltd., Leeds	2,173	18	0
Scarborough, Lincoln	2,147	0	0
Marrows, Grimsby	2,128	0	0
Hewins and Goodhand,* Grimsby	2,097	0	0
Holmes and Richardson, Grimsby	2,097	0	0

*Accepted.

Fenton, Staffs.—For erection and completion of a fire brigade station, foreman's residence, roller house, disinfector house and stores, together with boundary walls and other incidental works, for the Urban District Council:—

W. Moule, Trentham	£1,535	0	0
H. Wardle, Longport	1,450	0	0
H. Beckett, Fenton	1,339	0	0
Challinor and Hughes, Fenton...	1,330	0	0
Ball and Robinson, Stoke-on-Trent	1,290	0	0
T. Caulcott, Fenton	1,276	0	0
J. Walters, jun., Fenton ...	1,275	0	0
W. Cooke, Burslem	1,261	10	0
A. E. Chatfield, Hanley	1,240	0	0
S. Wilton, jun., Newcastle ...	1,207	0	0
H. Goodwin, Longton	1,200	0	0
S. Heath, Basford	1,188	0	0
P. H. Bennion, Longton	1,177	8	0
Tompkinson and Bettelley,* Longton	1,175	0	0
T. R. Yoxall, Stoke-on-Trent ...	1,165	0	0

*Accepted.

Maidstone.—For erection of a house near Maidstone. Mr. St. Pierre Harris, architect, 8, Laurence Pountney Hill, E.C.:—

T. Knight	£2,930
F. Wallis	2,737
Corben and Co.	2,700
Podger and Sons	2,583
Friday and Ling	2,490
W. Blay, Ltd....	2,477
W. Archer and Son,* Gravesend ...	2,476

*Reduced and accepted.

London, Poplar, E.—For the erection of a manual training centre, for 40 boys, at the Woolmore Street school, Poplar, for the London County Council:—

J. Grover and Son, New North road, Islington	£1,810	0	0
Snewin Bros. and Co., High Road, Upper Clapton	1,755	0	0
Patman and Fotheringham, Ltd., Park Street, Islington	1,751	0	0
Clarke and Bracey, 64, Coleman Street	1,729	0	0
Stevens and Sons, Yonge Park...	1,718	0	0
McCormick and Sons, Northampton Street, Essex Road ...	1,707	0	0
Brand, Pettit and Co., 247, West Green Road, South Tottenham	1,636	18	9
C. P. Roberts and Co., 138, St. Paul's Road, Highbury ...	1.634	0	0
E. Lawrance and Sons,* Wharf Road, City Road...	1,563	0	0

Estimate of the architect (Education) to the Council, £1,644.

*Recommended for acceptance by the Education Committee.

*Accepted.

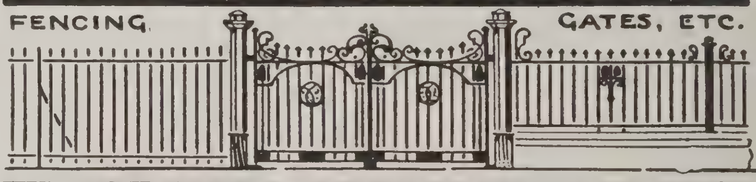
(*Tenders continued on page viii.*)

ROOFING SLATES.
Velinheli, Penrhyn and Westmoreland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

The "BAFECO"
Patent Automatic Burglar-Proof Trap Door Fire Escape.
As required by the Latest Building Act and Approved by District Surveyors.
Quite simple, yet most efficient in action and surprisingly cheap.
Full particulars and prices to be obtained from—
THE - -
BUILDING ACTS FIRE ESCAPE CO.,
4, Southampton Row, W.C.
Telephone 2366 Central.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters, Iron Doors and Iron Fire-Escape Stairs.
Premier Ironworks,
DEPTFORD, S.E.

WRITE TO THE MANUFACTURERS.
BAYLISS, JONES & BAYLISS, LTD.
FENCING GATES, ETC.



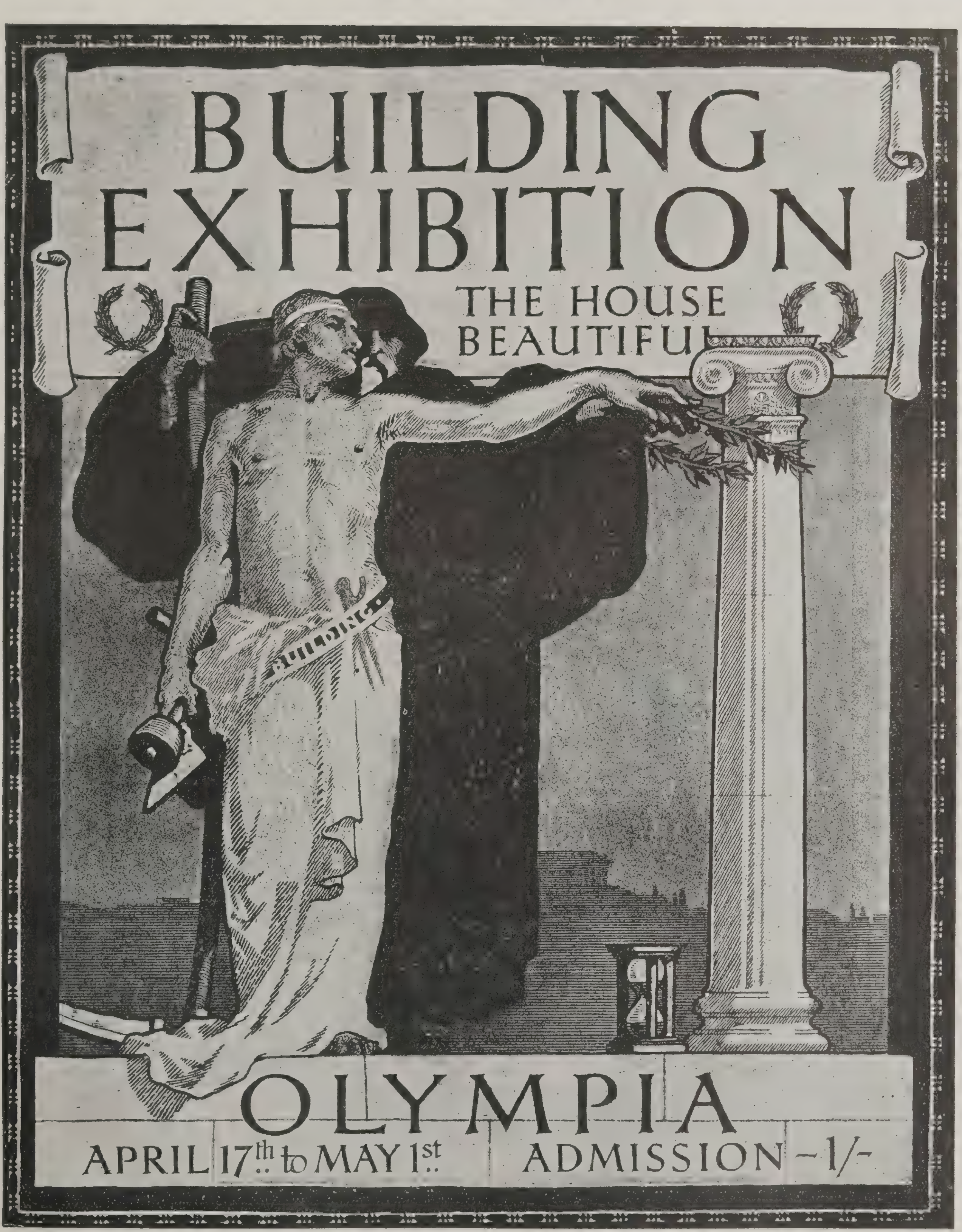
WOLVERHAMPTON & LONDON.
LOW PRICES. CATALOGUES FREE. (NAME THIS JOURNAL.)

NOSTELL BRICK AND TILE WORKS,
MANUFACTURERS OF NR. WAKEFIELD.
TERRA COTTA in BUFF, RED, &c.
ROOFING AND FLOORING TILES.
Tel. Address: "WINN NOSTELL"
Tel. No. 66, WAKEFIELD.
Representative: FRANK TALBOT, West Leigh, Walton, near Wakefield

X
EXCELITE
PLASTER
CLARK & CO., 32a, Westminster Palace Gardens, S.W.
The Most Perfect Substitute for Keene's at almost the price of Lime
ONE material only required for both render and finish
A Perfectly Sanitary Fireproof Cement
Telegrams: "CLARCOLITE, LONDON." Telephone: 5321 WESTMINSTER.
Works: Newark-on-Trent, G.N.R

FOLDING PARTITIONS. 2/- ft. Super.
REVOLVING SHUTTERS. 1/- ft. Super.
Hartley Bros.,
GORTON, MANCHESTER.

ARE YOU VISITING THE GREAT



Offices : **43, Essex Street, Strand, W.C.**

H. GREVILLE MONTGOMERY, M.P. } Promoters.
H. C. MONTGOMERY.

(Tenders continued from page vi.)

London, Lambeth, S.E.—For the construction of the raft foundation and retaining walls in connection with the new County Hall, for the London County Council:—

John Mowlem and Co., Ltd., Grosvenor Wharf, S.W. ...	62,949	0	0
Higgs and Hill, Ltd., South Lambeth Road, S.W. ...	61,462	0	0
Perry and Co. (Bow), Ltd., Victoria Street, S.W.	60,300	0	0
J. Carmichael, Trinity Road, Wandsworth, S.W.	59,576	0	0
Kirk and Randall, Warren Lane Works, Woolwich, S.E. ...	57,891	0	0
S. Pearson and Son, Ltd., Victoria Street, S.W.	57,544	15	5
Price and Reeves, Waterloo Place, S.W.	57,255	12	0
H. L. Holloway, Union Works, Deptford, S.E.	54,788	0	0
Holloway Bros. (London), Ltd., Belvedere Road, S.E.... ...	49,800	0	0
Charles Wall, Ltd., Lloyd's Avenue, E.C.	48,900	0	0
Dick, Kerr and Co., Ltd., Abchurch Yard, Cannon Street, E.C.	48,416	2	3
F. and H. F. Higgs,* Station Works, Loughborough Junction, S.E.	46,900	0	0

The architect's estimate comparable with the tenders is £54,000.

*Recommended by the Establishment Committee for acceptance.

London, Deptford, S.E.—For the construction of an embankment wall at the river frontage of the tramways permanent way depot, Greenwich Road, for the London County Council:—

John Shelbourne and Co., Fenchurch Street, E.C.	£5,671	0	0
John Mowlem and Co., Grosvenor Wharf, S.W.	5,491	0	0
Chafen and Newman, Ltd., Deptford, S.E.	5,206	15	0
Leggott and Speight, Hull ...	5,082	10	6
Anthony Fasey and Son, Leytonstone	5,012	3	6
Thomas W. Pedrette, Enfield ...	4,979	8	11
Stephen Kavanagh and Co., Surbiton Hill, Surrey	4,687	19	6
W. Muirhead and Co., Queen Victoria Street, E.C.	4,656	15	6
J. A. Ewart, Westminster, S.W.	4,635	9	6
John Cochrane and Sons, Victoria Street, S.W.	4,579	17	9
Mitchell Bros. (Contractors), Ltd., Victoria Street, S.W. ...	4,331	3	6
George Munday and Sons, Trinity Square, E.C.	4,324	0	0
Rowlingsons and Co., Quality Court, W.C.	4,209	15	9
Henry Woodlam and Sons, Catford, S.E.	4,177	0	0
Kirk and Randall, Woolwich, S.E.	3,775	0	0
Richard M. Parkinson, Peterborough	3,460	0	0
Thomas and Edge,* Woolwich S.E.	3,326	0	0

The estimate of the chief engineer comparable with these figures is £4,500.

*Recommended by the Highways Committee for acceptance.

London, Poplar, E.—For enlarging the playgrounds of the British Street school, and erecting a schoolkeeper's house, for London County Council:—

F. and F. J. Wood, 64, Cleveland Street	£2,681	0	0
H. Kent, 31, Beacon Road, Hither Green	2,431	11	10
G. Neal, Tennyson Works, Kilburn	2,328	0	0
A. Roberts and Co., Ltd, 74, Earl's Court Road	2,228	0	0
Brand, Pettit and Co., 247, West Green Road, South Tottenham	2,203	1	4
Griggs and Son, 71, Manchester Road, Cubitt Town	2,199	13	2
W. Harris, North Woolwich ...	2,174	0	0
A. E. Symes, Stratford	2,160	0	0
T. D. Leng, Evelyn Street, Deptford	2,111	0	0
McLaughlin and Harvey, Ltd., 13, Brecknock Road	2,094	0	0
J. Chessum and Sons, 7a, South Place	2,090	4	2
W. Shurmur and Sons, Ltd., Riverside Works, Upper Clapton	2,090	0	0
E. Lawrance and Sons, Wharf Road, City Road...	2,083	0	0
F. and T. Thorne,* Isle of Dogs	1,936	0	0

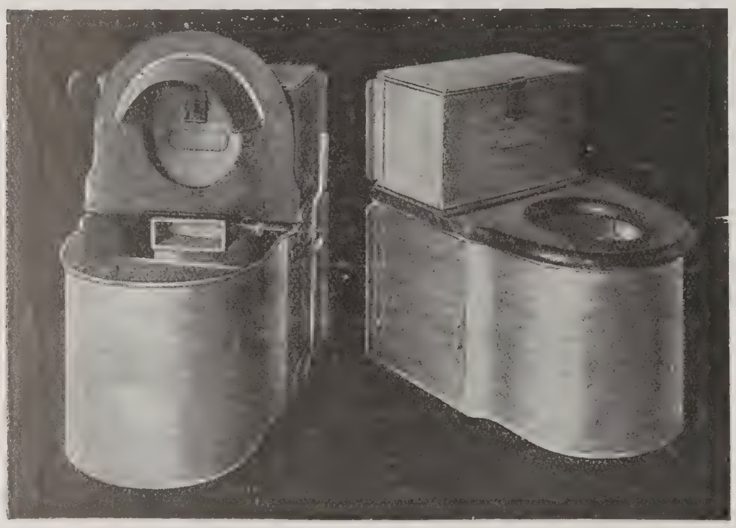
Estimate of the architect (Education) to the Council, £2,076.

*Recommended by the Education Committee for acceptance.

Swansea.—For erecting a new block of offices at York Street, Swansea, for Messrs. T. and T. Pascoes. Messrs. Margrave and Peacock, architects. Quantities by the architects:—

Bennett Bros	£4,876	0	0
Lloyd Bros.	4,603	0	0
T. Richards	4,600	0	0
D. Jenkins, Ltd.	4,500	0	0
G. Davies	4,400	0	0
D. Davies and Sons, Cardiff ...	4,400	0	0
D W. Davies, Cardiff	4,394	0	0
E. Turner and Sons, Cardiff ...	4,365	0	0
T. and D. Jones	4,350	0	0
Price Bros., Cardiff	4,326	1	10
R. Lacey	4,300	0	0
J. and F. Weaver*	4,200	0	0

Rest of Swansea.
*Accepted



The "DOMESTIC."

FIG. 99. Earth Closet in Sheet Steel.

Shewn with lever to cause discharge of the deodorant, and also **automatic**—the latter type acting as the user rises from the Seat. Dry earth, sawdust, sand or ashes may be used.

Price, plain Painted Body, and Galvanized Iron Earth Box, with Pitch Pine Varnished Seat £3 10 0
If Automatic 3 15 0
If Mahogany Seat, add 5/-; if Body Grained, add 7/6: if Body Galvanized, add 16/-; if Body Galvanized and Automatic, add 25/-,

In this Earth Closet the pail is removed by lifting the lid, or by the back. In the latter case, an opening is provided in back wall of the building to permit this.

For other types and prices, write the manufacturers:

ADAMSEZ Ltd., SCOTSWOOD-ON-TYNE.

TANK ROOF TO FACTORY 190 ft. by 57 ft.

The Chain Concrete Syndicate.

Constructional Engineers in Reinforced . . Concrete. . .

The most complete system in existence.
Every Member, Tension or Shear, RIGIDLY FIXED.
No Loose Bars to be misplaced during Concreting.

Fireproof Floors, Flat Roofs, Reservoirs, Culverts, Bridges,

Write for Pamphlet—

1, Basinghall Square, LEEDS, and Carlton Street, CASTLEFORD.

The "Centenary" Petrol Gas Turbine Generator,
For Supply to a City or a Cottage.

THE CENTENARY GAS CO. (Dept. E), 11, QUEEN VICTORIA ST., LONDON, E.C., & 109, Hope St., Glasgow.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

April 15. BRIDLINGTON.—Erection of a greenhouse at the corporation nurseries, Quay Road, for the Corporation. Plan and specification of E. R. Matthews, borough surveyor. Tenders, endorsed "Greenhouse," by April 15, to A. E. Matthewman, town clerk, town hall, Bridlington.

April 15. KILLINEY, IRELAND.—Additions to cottage and other works at the Martello Tower premises, Killiney, for the Killiney and Ballybrack U.D.C. Plans and specifications at the council offices. Tenders by April 15, to Robert Cunningham, town clerk, Killiney, Co. Dublin.

April 15. DALTON.—Various works in the erection of a detached house in Long Lane, Dalton. Bills of quantities and drawings on application to Norman Culley, A.R.I.B.A., architect, 13, John William Street, Huddersfield, to whom tenders are to be sent by 3 p.m. on April 15.

April 15. GLASGOW.—(1) Mason work; (2) painter work; (3) plumber and gasfitter work, from June 1st to May 31, 1910; also supplying dross and triping for six or twelve months from June 1, for the Corporation. Schedules and forms of offer on application to Wm. C. Menzies, manager, 22, King Street, Glasgow. Offers, marked outside "City Improvements Department—offer for ——," by April 15, to A. W. Myles, town clerk, City Chambers, Glasgow.

April 15. BURRY PORT (WALES).—Erection of a dwelling-house at Tabernacle Road, Burry Port. Tenders must be received by April 15. Plan and specifications from A. Wilcox, Old Harbour, Burry Port.

April 15. MILFORD HAVEN.—Erection of a shop and alterations and additions to the Grimsby Stores, on the Docks, Milford Haven. Plans and specification from C. Launcelot Blethyn, architect, Milford Haven, to whom tenders are to be delivered by noon on April 15.

April 15. MORLEY.—Various works (except plumbers) in the erection of additional premises, Prospect Mills, Morley, for J. and S. Rhodes. Plans and specifications and quantities at the Morley office of the architect on and after April 8. Tenders by 4 p.m. on April 15, to T. A. Buttery, F.I.A.S., architect, Queen Street, Morley, and 1, Basinghall Square, Leeds.

April 15. WREXHAM.—Completion of erection of the Alexandra Schools, for the education committee. Names to the architects, Burrell and Willey, Market Place Chambers, Durham, by April 15.

April 15. HINDLEY (LANCS.).—Erection of a new Congregational church (St. Paul's), Hindley (sole tenders). Names to the architect, Herbert Wade, 27, Birley Street, Blackpool, by April 15.

April 15. FALKIRK.—Mason, joiner, slater, plumber, plasterers, painter, heating, and tiling works of extension to Falkirk High School, for the Falkirk Burgh School Board. Plans and schedules of quantities of A. and W. Black, architects, Falkirk. Tenders with Thos. Gibson, clerk, Falkirk, by 10 a.m. on April 15, marked on outside "Tender for High School Extension."

April 16. SITTINGBOURNE.—Shedding, offices, stands, and other works for the Agricultural Show to be held at Sittingbourne on July 7 and 8, for the East Kent Agricultural Society. Specification and forms of tender of the secretary, Percy M. Collard, Little Barton, Canterbury. Tenders to be sent in by April 16.

April 16. NEWCASTLE-ON-TYNE.—Alterations and extensions of premises, for the Co-operative Society, Limited, Easington Lane. Plan and specifications of L. G. Ekins, Newcastle-on-Tyne, architect, at the Society's office, 1, Store Terrace, Easington Lane, until April 14. Tenders by April 16, to the Society.

April 16. EMLEY.—Builder, joiner, slater, plumber, plasterer, and painter works at Emley Provided School, for the West Riding Education Committee. Plans, specifications with quantities on application to the West Riding architect, County Hall, Wakefield. £1 deposit in each case by separate letter to the West Riding treasurer, County Hall, Wakefield, by 10.30 a.m., on April 16, to Francis Alvey Darwin, clerk to the C.C., County Hall, Wakefield.

April 17. ELY.—Alterations at the hospital at the Headquarters Homes, Ely, for the Guardians of Cardiff Union. Plans and specifications by the architect, Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff, from whom bills of quantities may be obtained on deposit of £1 1s. Forms of tender from the architect must be sent by 10 a.m. on April 17, endorsed "Tender for Alterations Headquarters Hospital, Ely," to Arthur J. Harris, clerk, Queen's Chambers, Cardiff.

April 17. EASTRY (KENT).—Additional building to the National Schools. Plans and specifications of D. E. Hughes, Eastry. Tenders, marked "Tender for Enlargement," by April 17, to the Rev. C. D. Lampen, Eastry, S.O.

April 17. WHITTINGTON (near CHESTERFIELD).—Erection of a new dwelling-house, boundary wall, etc., at the works of the Whittington Gas Co., Ltd. Drawings and specifications on application to the manager, to whom tenders are to be sent by April 17.

April 17. BAGWORTH (near LEICESTER).—Erection of three blocks of six cottages at Bagworth, near Leicester, for the Desford Coal Co., Ltd. Drawings and specifications at the Colliery Office Bagworth. Tenders to be sent in by April 17.

April 17. NEW MILLS.—Erection of new Carnegie library in Hall Street for the U.D.C. and free library committee. Plans and bills of quantities from the architect, R. B. Preston, 51, South King Street, Manchester. Tenders (endorsed) to Joseph Pollitt, clerk, town hall, New Mills, by April 17.

April 17. TRURO.—Restoration of 5 cottages, at Clarke's Buildings, Pydar Street, for T. Pascoe, Truro. Plans and specifications at 36, Pydar Street, Truro, to April 16. Tenders to T. Pascoe, 36, Pydar Street, Truro, by April 17.

April 17. DUDLEY.—Erection and completion of a new high school for girls (accommodation about 350 places) at Dudley. Applications to J. Hutchings, architect and surveyor, county education offices, Stafford, by April 17. Quantities will be supplied upon deposit of £3 3s., which should accompany the application.

April 17. BURY (LANCS.).—Erection of 50 cottages (five pairs each of five types), Bolton Road, Bury, for the corporation. Drawings and specifications and quantities, with form of tender, on application to Arthur W. Bradley, A.M.I.C.E., borough engineer and surveyor, Bank Street, Bury, on deposit of £2. Tenders, endorsed "Housing Scheme—Bolton Road," to the town clerk, Bury, by April 17.

April 17. BISHOPWEARMOUTH.—Erection of the new church, Bishopwearmouth. Plans, specification, and general conditions of contract and bills of quantities at the office of C. A. Clayton Greene, architect and surveyor, 18, Norfolk Street, Sunderland. Tenders, endorsed "St. Gabriel's Church Tender," by April 17, to H. E. Hinkley, secretary St. Gabriel's Church Building Committee, 68, Cleveland Road, Sunderland

April 19. WEST HARTLEPOOL.—Erection of the Empire Theatre. Quantities will be supplied upon receipt of name and address and deposit of £2 2s. with the architects. Tenders by noon on April 19, to W. and T. R. Milburn, FF.R.I.B.A., architects, 20, Fawcett Street, Sunderland.

April 19. YSTRADMYNACH (WALES).—Erection of a schoolroom at Ystradmynach for the committee of the Independent Home Mission (Northern District). Plans and specifications of T. Roderick, architect, Clifton Street, Aberdare. Tenders to Rev. H. A. Davies, 25, Tudor Terrace, Aberdare, by April 19.

April 19. DAVENHAM.—Additions and alterations to the school, for the managers. Bills of quantities and drawings upon application to A. E. Powles, architect, 7, Winnington Street, Northwich, upon deposit of £1 1s. Tenders to be sent in by April 19.

April 19. ENNISCORTHY (IRELAND).—Construction of, and additions to, the Market House, in adapting it for a technical school, for the U.D.C. Plans, etc., prepared by T. Burke-Lowey, 62, Dame Street, Dublin, at whose office and the office of the council, Enniscorthy, plans, etc., can be inspected. Tenders to be sent in by April 19.

April 19. MOUNT BOLUS, KING'S CO., IRELAND.—Erection of curate's residence, at Mount Bolus, King's Co. Plans and specification at the Parochial House, Kilcormac, King's Co., and at the office of the architect, Thos. F. McNamara, 50, Dawson Street, Dublin. Tenders to be posted to the Very Rev. E. O'Reilly, P.P., Kilcormac, by April 19.

April 19. METHLEY.—Alteration of existing building at Methley into eight cottages. Plans and specifications and bills of quantities and forms of tender on deposit, by cheque, of £1 1s., with John S. Richardson, C.E., East Parade Chambers, Leeds, to whom tenders are to be sent by noon on April 19.

April 19. HADDENHAM (I. of ELY).—Erection of a new class-room, together with alterations and additions at the Council school, Aldreth Road, Haddenham, for the Isle of Ely education committee. Plans and specifications at the county surveyor's office, Ely. Tenders, endorsed "Haddenham School," to J. H. Haigh, education secretary, education offices, March, by 10 a.m. on April 19.

April 19. TROEDYRHIW (WALES).—Erection of six pairs of semi-detached houses at Glantaff Road, Troedyrhiw, for the Bronreulog Building Club. Plans and specifications at the office of T. Edmund Rees, architect and surveyor, Gernant, The Walk, Merthyr Tydfil. Tenders to D. Francis, M.E., Ash Villa, Troedyrhiw, by April 19.

April 19. LONDON, S.W.—Alterations and additions to Battersea Station, for the West London Extension Railway. Plans and specifications, and forms of tender and bills of quantities, at the office of the engineers at Paddington (G.W. Railway Station), between 10 a.m. and 4 p.m. Tenders to Ernest C. Price, secretary, 57, Moorgate Street, London, E.C., and marked outside "Tender for Battersea Station Improvements," by April 19.

April 20. ALLONBY.—Various works in alterations to "The Baths," at Allonby, for T. Watson and Sons. Plans and specifications and bills of quantities upon application to W. G. Scott and Co., architects and surveyors, 2, Park Lane, Workington, to whom tenders are to be sent by April 20.

April 20. ASTON MANOR.—Construction of a sub-station at Alma Street, Aston Manor, for the Corporation. Plans, etc., and bill of quantities at the borough surveyor's office, Council House, Aston Manor, deposit of £1 1s. Tenders to be sent in by April 20.

April 20. WENTLOOG.—Erection of a cottage at the main sewerage outfall in the parish of St. Bride's, Wentloog, for the Western Valleys (Monmouthshire) Sewerage Board. Plans and specifications and copies of the quantities and form of tender of the engineer, Baldwin Latham, M.Inst.C.E., Parliament Mansions, Victoria Street, Westminster, S.W., and George Chatterton, M.Inst.C.E., 6, The Sanctuary, Westminster, S.W., or of the resident engineer, J. F. Jupp, A.M.I.C.E., at his office at Bassaleg, on deposit of £2 2s. Tenders, endorsed "Tender for the Erection of Cottage," by April 20, to T. S. Edwards, clerk to the board, 24, Stow Hill, Newport, Mon.

April 20. ASHTON-UNDER-LYNE.—Alterations to servants' quarters at the district infirmary, Ashton-under-Lyne. Plans and bills of quantities on application to C. H. Jenkinson, Albion Villa, Queen Street, Ashton-under-Lyne. Tenders to be sent to the secretary, at the infirmary, by April 20.

April 21. KINGSDOWN.—Builders', plumbers' and electricians' work connected with the erection of a Council school at Southwell Street, Kingsdown, for the Bristol Education Committee. Drawings, specifications and general conditions of contract on deposit of £2 2s. Forms of tender and bills of quotations at the office of the architect, W. S. Skinner, F.R.I.B.A., Edinburgh Chambers, Baldwin Street, Bristol. Tenders before noon on April 21 to Wm. Avery Adams, secretary, Guildhall, Bristol.

April 21. TALYWAIN (WALES).—Erection of a hall and classrooms for the trustees of the Pisgah Church, Talywain. Plans and specification of D. J. Lougher, architect, Bank Chambers, Pontypool, to whom tenders, endorsed "Hall and Classrooms," are to be sent by April 21.

April 21. MUSBURY.—Erection of cow stalls and hay store at Ashe Farm, Musbury, for the executors of the late James Smyth. Plans and specifications of B. and J. Gage, agents, Bank Chambers, Axminster, to whom tenders are to be sent by April 21. £10 deposit.

April 21. BLACKBURN.—Erection of a bandstand in the Corporation Park, Blackburn, for the Corporation. Specifications, bills of quantities, and forms of tender of William Stubbs, A.M.I.C.E., borough and water engineer, Municipal Offices, Blackburn, to whom tenders are to be sent by April 21.

April 22. DARTMOUTH.—Erection of a pair of semi-detached villas at Townstal, Dartmouth, for Dr. Richard B. Searle. Plans and specifications, and copy of bills of quantities, on deposit of £1 1s., at the office of W. Percy Marr, A.R.I.B.A., architect and surveyor, Dartmouth. Tenders to be delivered by April 22.

April 22. LIMAVADY (IRELAND).—Erecting and completing a manse on the Rabbit Brae, Limavady, for the committee of the First Limavady Presbyterian Church. Plans and specification with Rev. William Browne, B.A., Catherine Street, Limavady. Tenders with R. A. Thorpe, Limavady, by noon on April 22. A detailed estimate of work must accompany contractor's tender.

April 22. SWANSEA.—Supply, delivery, and erection in situ at the King's Dock, Swansea, of (1) one framed and braced steel single-storied transit shed, with sides and roof covered with galvanised corrugated iron, 400ft. long by 120ft. broad, in two spans of 60ft.; and (2) one framed and braced steel single-storied transit shed, with sides and roof covered with galvanised corrugated iron, 400 ft. long by one span of 60ft., for the Swansea Harbour Trustees. Forms of instructions, specifications, and conditions and drawings of Talfourd Strick, clerk, Harbour Offices, Swansea, on deposit of £5 5s. Tenders, marked "Tenders for Warehouses," to the clerk by 10 a.m. on April 22.

April 22. LONDON.—Erection of depot buildings, on a site at Norman Road, Greenwich, for the corporation. Drawings, specification, and conditions, forms of tender, and other particulars, from the borough engineer and surveyor's office, town hall, Greenwich Road, S.E., on deposit of £2 2s. Tenders, endorsed "Tender for depot buildings," by 4 p.m. on April 22, to Francis Robinson, town clerk, town hall, Greenwich Road, S.E. Fair wages clause.

April 23. STOCKTON-ON-TEES.—Alterations and additions to the county police station at Stockton-on-Tees. Plans, specification, and conditions of contract and bills of quantities at the county architect and surveyor's office, Shire Hall, Durham, obtainable on all days except April 9 to 12 inclusive. Tenders, endorsed "Stockton Police Station," to William Crozier, A.M.I.C.E., county architect and surveyor, by noon on April 23. Security required.

April 24. CYMMER.—Erection of a retaining wall, iron work, and concrete floor at Avondale Hotel, Cymmer. Also alterations and additions to the above hotel. Drawing and specification at the hotel. Tenders by April 24, to the secretary, Rhondda Valley Breweries Company, Limited, Pontypridd.

April 24. CARNKIE (near REDRUTH).—Renovation of the Primitive Methodist Church, Carnkie. Plans, etc., may be seen by appointment at the office of Sampson Hill, architect, Green Lane, Redruth. Tenders to be sent in by April 24.

April 27. PORTSMOUTH.—Alterations to the police department at the town hall, Portsmouth. Specification and plan and a form of tender at the borough engineer's office at the town hall. Form of tender is to be completely filled in and sent under cover to reach Alexander Helard, town clerk, town hall, Portsmouth, by 10 a.m. on April 27. Fair wages clause.

April 27. WREXHAM.—Alterations and additions to the goods shed at Wrexham for the directors of the G.W. Railway. Plans and specification and forms of tender and bills of quantities at the office of the resident engineer at Birmingham station. Tenders marked "Tender for Works at Wrexham," by April 27, to G. K. Mills, secretary, Paddington Station, London.

No date. BEVERLEY.—Erection of a new Baptist church and schools at Beverley. Names (for whole trades only) to Garside and Pennington, architects and surveyors, Pontefract and Castleford, when bills of quantities and all particulars will be sent.

No date. SHEFFIELD.—Erection of three houses and saleshop. Particulars by applying to P. 60, "Sheffield Telegraph."

No date. SEVEN SISTERS.—Erection of proposed Manse House, Seven Sisters, for the building committee. Plans, etc., upon application to J. Cook Rees, architect, Parade Chambers, Neath.

No date. RAWTENSTALL.—Various works in erection of two villas, Oakenhead Wood, Rawtenstall, for Whitaker and Ashworth. Quantities and particulars from F. J. Hobson, architect, 19, King Street, Rawtenstall.

No date. WATERFOOT.—Various trades in the erection of ten cottages in Cowper Road, Waterfoot, for James Trickett. Plans and specifications and bills of quantities of Richard Cunliffe, architect, Willow Street, Waterfoot.

No date. ATTERCLIFFE.—Erection of three cottages in Calvert Road, Attercliffe. Persons desirous of tendering should apply to 22, Palmer Road, Attercliffe

ENGINEERING.

April 17. SANDBACH, CHESHIRE.—Supply and erection of a gas engine and suction produced gas plant; also supply and erection of a vertical 3-throw ram pump and shafting, for the U.D.C. Plans and copies of specifications at the surveyor's office, Welles Street, Sandbach. Tenders, endorsed "Gas Engine, etc.," "Pump, etc.," as the case may be, by noon on April 17 to A. E. Stringer, clerk to the council, Sandbach, Cheshire.

April 21. KINGSDOWN.—Heating and ventilating the Council School to be erected at Southwell Street, Kingsdown, for the Bristol Education Committee. General conditions of contract and drawings on deposit of £1 1s. Bills of quantities, copy of specification, and form of tender at the office of the architect, W. S. Skinner, F.R.I.B.A., Edinburgh Chambers, Baldwin Street, Bristol. Tenders before noon on April 21 to Wm. Avery Adams, secretary, Guildhall, Bristol.

May 3. BATH.—Taking down and rebuilding the undermentioned two small bridges, for the Somersetshire C.C.: Bottle Bridge, Hatch Beauchamp, new reinforced concrete arch, 23ft. span, and abutments, masonry walls, etc.; Donyatt Bridge, near Ilminster new masonry abutments, walls, etc., and reinforced concrete beams and floor, 12ft. span. Drawings, specifications and form of contract may be seen by appointment at the county surveyor's office, Bath, on and after April 19, and bill of quantities and forms of tender at the county surveyor's office, upon deposit of £2 2s. Tenders, endorsed "Bottle Bridge" or "Dodenyatt Bridge," by May 3, to H. T. Chapman, county surveyor, 1, Chapel Row, Bath.

May 14. LONDON (FOR CALCUTTA).—Supplying and laying a steel main 6ft. and 5ft. diameter in a trench prepared by the Corporation for its reception. Also supply and erection of three girder bridges, and the supply and fixing of certain sluice valves, air valves, branches, etc., for the commissioners of the Corporation of Calcutta. Specification and form of agreement and drawings of the Indian and Eastern Engineer, 50, Fenchurch Street, London, E.C., on deposit of £5. Tenders, which may be made in sterling or rupees, are to be enclosed in sealed covers, addressed the Vice-chairman, Corporation of Calcutta, and endorsed "Tender for steel pipes." The successful tenderer will be required to find security approved by the Corporation to the extent of £5,000 for the due performance of the work.

April 27. LEEDS.—Construction and erection of the steelwork for a bridge 75ft. wide by 42ft. span over Bridge Street, Leeds. Drawings, specification, and conditions of contract and bills of quantities on deposit of £3 3s., of W. T. Lancashire, city engineer, municipal buildings, Leeds. Tenders at the town clerk's office by 10 a.m. on April 27.

IRON AND STEEL.

April 15. CHEPPING WYCOMBE.—Supplying Cast-iron pipes and fittings, surface covers, stopcocks, and bib-cocks, and galvanised steam tubes and fittings, for the Corporation. Specifications and forms of tender of T. J. Rushbrooke, waterworks engineer, 77, Easton Street, High Wycombe, to whom tenders are to be sent by April 15.

April 17. BRAINTREE, ESSEX.—Delivery and erection of a new square stamped steel tank in the tank yard, Braintree, for the U.D.C. Drawings, specification, and form of tender from the engineer, Percy Griffith, M.Inst.C.E., F.G.S., 54, Parliament Street, Westminster, S.W., on deposit of £2. Tenders, endorsed "Contract No. 4," to be delivered by April 17, to Herbert J. Cunnington, clerk to the council, Braintree, Essex.

PAINTING.

April 15. STAFFORD.—Painting work for the corporation. Forms of tender and other particulars on application to W. Blackshaw, borough engineer, Borough Hall, Stafford. Sealed tenders to be delivered at the office of R. Battle, town clerk, Borough Hall, Stafford, by April 15. Fair wages clause.

April 15. PLYMOUTH.—Painting the lodge, lavatories, etc., at the Victoria Park, for the Corporations of Plymouth and Devonport and Stonehouse U.D.C. Specification and form of tender at the offices of the engineer and surveyor. Tenders by 5 p.m. on April 15, to James Paton, borough engineer and surveyor, Municipal Offices, Plymouth.

April 17. BACUP.—Painting and decorating the chapel, school, and vestries of Beulah Chapel, for the trustees. Specifications and information of M. R. Chestney, Deansgreave, Britannia, Bacup, to whom tenders are to be sent by April 17.

April 22. CROOK (DURHAM).—Painting, etc., the Westgate Council School, for the Durham County education committee. Specifications and form of tender of S. A. Meddick, 11, Belle Vue, Crook, R.S.O., to whom tenders must be sent by April 22.

PLUMBING & SANITARY

April 15. NEW DELAVAL.—Providing and laying about 3,000 yards of 4in. and 3in. water mains, together with sluice valves, hydrants and other fittings, at New Delaval, for the Tynemouth R.D.C. Plans and specifications at the office of A. S. Dinning, 21, Ellison Place, Newcastle-on-Tyne. Tenders, endorsed "New Delaval Water," by noon on April 15, to A. Whitehorn, clerk to the council, 60, Saville Street, North Shields.

April 17. LYTHAM.—(1) Laying 270 yards of 24in. earthenware pipes and 52 yards of cast-iron pipes, with sea outfall, manholes and other works; (2) laying 184 yards of 18in. and 962 yards of 24in. earthenware pipes, and 8 yards of 18in. and 24 yards of 24in. cast-iron pipes, with storm overflow chambers, manholes and other works, for the U.D.C. Plans and specifications, bills of quantities, and forms of tender at the office of the engineer, A. J. Price, Council Offices, Lytham, on deposit of £2 2s. cheque. Tenders, endorsed "Sewerage Works, Contract No. 1," or "Contract No. 2," by noon on April 17, to Chas. A. Myers, clerk to the council, Council Offices, Lytham.

April 20. HALTWHISTLE.—Construction of about 2,500 yards of 9in. and 6in. glazed earthenware pipe sewers with manholes, lampholes, flushing chambers, a cast-iron inverted syphon under the River Irthing and works in connection therewith for the sewerage of Gilsland, together with tanks, bacteria beds, and other works for sewage purposes, for the R.D.C. Plans and specifications, and other particulars on application to the engineer, J. E. Parker, A.M.I.C.E., Post office Chambers, St. Nicholas' Square, Newcastle-on-Tyne, or to the council offices, Haltwhistle, on deposit of £1 1s. (cheque). Tenders, marked "Gilsland Sewage," before noon on April 20, to Thomas Dryden, clerk to the R.D.C., Haltwhistle.

April 20. BELFAST.—Sewering, paving, etc., new streets, to be completed during the next twelve months, for the Corporation. Specification and form of tender of the city surveyor on deposit of £1 1s. Tenders, endorsed "Tender for Streets," by 10 a.m. on April 20, to Robert Meyer, town clerk (pro tem.).

May 3. DAWLISH.—Laying about 2½ miles of stoneware pipe sewers and other incidental work in accordance with drawings and specifications prepared by the engineer and surveyor to the council, for the U.D.C. Drawings and conditions, specifications and bills of quantities at the office of the engineer and surveyor, S. F. C. Churchward, Dawlish, on deposit of £3 3s. Tenders by May 3, endorsed "Tender for Sewers," to Francis S. Cole, clerk to the council, Dawlish.

ROADS AND CARTAGE.

April 19. BROADSTAIRS.—Supplying and delivering 1,375 feet run of 6-in. by 12-in. granite kerbing (straight), 55 feet ditto (circular, 6 ft. radius), 2,320 feet run of 12-in. by 6-in. granite channelling (straight), for the Broadstairs and St. Peter's U.D.C.. Tenders endorsed "Tender for Granite Kerbing, etc.," by noon on April 19, to Lionel A. Skinner, clerk to the council, council offices, Broadstairs. Forms can be obtained from H. Hurd, C.E., town surveyor, council offices, Broadstairs.

April 19. PLYMOUTH.—Making-up and completing, under section 150 of the Public Health Act, 1875, the following streets.— 1, Holland Road; 2 Apsley Road, section 2, for the Corporation. Plans and specifications, and conditions, and bills of quantities of James Paton, borough engineer, Municipal Offices, Plymouth, to whom tenders must be sent by 5 p.m. on April 19.

April 19. EBBW VALE.—Draining, forming, ballasting, kerbing, channelling, paving, erecting boundary walls, and otherwise improving Wall Street and William Street, Ebbw Vale, for the U.D.C. Plans, sections, and specifications, and form of tender, with bills of quantities, of T. J. Thomas, town engineer and surveyor. Tenders, endorsed "Tenders for Street Improvements," by noon on April 19, to Tho. Hughes, clerk. £1 deposit.

April 22. GLOUCESTER.—Supplying stone and hauling, for the R.D.C. Forms of tender at the offices of the council, Gloucester, and from F. E. Weaver, district surveyor. Tenders, endorsed "Tenders for Stone," or "Tenders for Hauling," by April 22, to Herbert H. Scott, clerk to the council, Berkeley House, Berkeley Street, Gloucester.

April 22. NEWMARKET.—Supplying broken granite and slag of the following sizes:—Granite: 1,000 tons 2½in.; 300 tons 1in. to 1¾in.; 200 tons ½in. to ¾in. Slag: 300 tons 2½in. to 1¾in.; 200 tons 1½in., for the U.D.C., to be delivered as may be ordered before March 31, 1910, at Newmarket and Burwell Stations (G.E.R.). Forms of tender on application to S. J. Ennion, clerk to the council, together with samples, at the town hall, Newmarket, by noon on April 22.

April 27. NORTHFLEET.—Levelling, paving, metalling, kerbing, channelling, and making good Havelock Road and the southern end of Stanbrook Road, Northfleet, for the U.D.C. Conditions and forms from the district surveyor, The Hill, Northfleet. Separate tenders must be made in connection with each road. Tenders by 4 p.m. on April 27, to the council offices, The Hill, Northfleet.

MISCELLANEOUS.

April 24. ROSEDALE.—Re-seating Rosedale Church with pitch-pine. Tenders to be sent to the Vicar by April 24.

April 21. GLASGOW.—Supplying for one year from June 1 brass furnishings, plumbers' furnishings, M.I. steam goods, india-rubber and asbestos goods, cartage of breeze and ashes, for the Corporation. Forms of tender and particulars on application to William Thomson, general manager, 187, George Street. Offers, marked outside "Tenders for ——, Baths Department," by April 21, to A. W. Myles, town clerk, City Chambers, Glasgow.

April 28. BRADFORD.—Supply and erection of natural draught chimney type cooling towers, for the Corporation. Specification, general condition of contract, and forms of tender from Thomas Roles, city electrical engineer and manager, electricity offices, Whitaker Buildings, Bradford, on deposit of £1 1s. Tenders by first post on April 28, endorsed "Contract R. 7," to Frederick Stevens, town clerk, Town Hall, Bradford. Fair wages clause.

THE

Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:

8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,

General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph .."Federated, Manchester.

Appointments Wanted.

The charge for Advertisements under this heading 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE architect prepares designs, perspectives, working drawings, etc., on moderate terms.—W., 6, King's Road, Kingston-on-Thames. 4918

ABLE ASSISTANCE rendered, drawings, tracings, photo-prints prepared, plans from rough sketches, specifications, etc.—Yorkshire Drawing Office, 21, Scale Lane, Hull. 4940

ARCHITECT'S Assistant (24), disengaged; Inter. R.I.B.A.; 6½ years' varied experience; working drawings, details, and perspectives, levelling; assist with quantities; shorthand and typewriting; excellent references. — S. Riches, 35, Culverden Road, Balham, S.W. 4963

ADVERTISER (20), three years with Quantity Surveyors, wishes to enter Builders' Office (preferably estimating department); excellent testimonial; very low commencing salary, with good prospects. —E., 2, St. Mary's Road, London, S.E. 4960

APPOINTMENT as Improver (19), prob. R.I.B.A., just completing three years' articles with an architect and surveyor; small salary to commence; highly recommended.—H. Cullerne, "Bridge House." Lugwardine, Hereford. 4911

ARCHITECT'S Assistant (28) seeks situation; thoroughly competent in all design and construction, including steelwork and ferro-concrete; details, specifications, quantities, surveying; eleven years' experience; manage office; permanency preferred; excellent references.—Apply, at first, Box 4954, BUILDERS' JOURNAL Office.

ARCHITECTURAL Draughtsman, thoroughly experienced in designing steel and ferro-concrete work, factory chimneys, retaining walls, foundations, overhead gantries, and all constructional work is open to assist or consult architects by correspondence.—Box 4927, BUILDERS' JOURNAL Office.

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECTS, Builders, etc., draughtsman (19), used to general work, fill up time in office; good references.—F. J. Williams, c/o F. Cundall, Architect and Surveyor, 34, Parade, Leamington Spa. 4878

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. [illegible]

ARCHITECT'S Assistant (27), excellent draughtsman and colourist; contract drawings, specifications, details, design, perspective, surveys, etc.; travelling studentship winner; highest refs.—Box 4902, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant (23) desires engagement, town or country; excellent draughtsman; good general experience; first-class references.—Box 4937, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant (26), desires engagement at moderate salary; good draughtsman.—Address, Young, Narellan, Old Colwyn. 4950

ARCHITECT and Surveyor's junior assistant (19), desires engagement; surveying, levelling, etc.; office routine; salary 15s.—Box 4930, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant (25), R.I.B.A. exam., nine years' thorough practical experience, design, working drawings, details, specifications, estimating, quantities, levelling, perspectives, etc.; sal. moderate.—Apply, Box 4900, BUILDERS' JOURNAL Office.

ARCHITECT'S fully qualified Assistant and Quantity Surveyor, energetic and experienced, desires immediate engagement, temporary or otherwise; competition expert; highest references; salary moderate.—W. B., 156, Warwick Road, Birmingham. 4935

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

ASSISTANT A.R.I.B.A. (29), 14 years' London and Provincial experience; working drawings, details, specifications, supervision, perspectives, assist quantities, well up in management; testimonials; references; salary, 2 guineas.—Apply A, 31, Cotswold Road, Westcliff-on-Sea, Essex. 4775

ARCHITECT'S Junior Assistant, 5½ years' experience; disengaged; working and detail drawings, typewriting, knowledge of perspective; moderate salary.—W. L. Francis, 11, Middleton Road, Ilkley, Yorks. 4891

ARCHITECTS, and builders, experienced surveyor open to prepare quantities and estimates, check accounts and measuring; moderate terms.—Apply Box 4817, BUILDERS' JOURNAL Office.

ASSISTANT Surveyor seeks re-engagement; 9 years with City firm; highest testimonials; surveys, levels, estate management, etc.; shorthand if required; moderate salary.—K., 21, First Avenue, Manor Park. 4917

ASSISTANT, provincial experience, good planner and designer, domestic Renaissance, working drawings, details, surveying, competitions; excellent draughtsman, A.R.I.B.A. at one sitting; age 27.—Box No. 4928, BUILDERS' JOURNAL Office.

BUILDERS' Assistant desires situation; thorough knowledge plans, specifications, quantities, measuring; not afraid of work; salary not so much an object as permanent situation; 21; 5 years' experience.—Box 4839, BUILDERS' JOURNAL Office.

BUILDER and contractor's estimating and managing clerk seeks berth, exceptionally good all-round qualifications, acquired by sound London and provincial experience, and a reliable and successful estimator, including sewerage and kindred works; good references.—T. C., 3, Hampton Terrace, Brighton. 4933

BUILDER'S or Architect's Junior Assistant (18), good tracer, well up in prime cost, and general office work; excellent references; three years' experience. — J. W., 164, Wellesley Road, Ilford, Essex. 4833

BUILDER (38), life experience, seeks engagement as Building or Estate Clerk of Works or Builders' General Foreman; thorough knowledge of plans, details, quantities, and accounts; accurate setting out; good manager all trades.—Box 4958, BUILDERS' JOURNAL Office.

BUILDING Exhibition.—Young architect is prepared to assist exhibitors at the above; can reach same daily; terms low.—Box 4925, BUILDERS' JOURNAL Office.

BUILDING Trades' Exhibition, 1909.—Gentleman, with wide architectural experience, offers services to provincial or other exhibitors as representative at their stand; for terms apply Box 4931, BUILDERS' JOURNAL Office.

BUILDER'S or Architect's Assistant (25), Inter. R.I.B.A.; neat draughtsman, levelling and surveying; assist quantities, specifications, accounts, and general routine; excellent references; moderate salary for experience. — H. O'R., 80, Lavender Sweep, Clapham Common, S.W. 4973

CLERK of Works, first-class, shortly disengaged; well up in all trades; best London references; abstainer.—R.E., 2, William Road, Guildford, Surrey. 4977

CLERK of Works, shortly disengaged; first class; well up in all trades; best London references; abstainer.—R. E., 2, William Road, Guildford, Surrey. 4972

CLERK of Works, desires re-engagement, possessing first-class testimonials for ferro-concrete construction, also from Metropolitan Borough Councils, eminent architects and engineers; age 45.—Box 4922, BUILDERS' JOURNAL Office.

CLERK of Works, shortly disengaged, well up in all trades, best London references; abstainer.—R.E., 2, William Road, Guildford, Surrey. 4938

DRAUGHTSMAN (junior), 5 years' experience in structural engineers, good knowledge of constructional and ornamental work, details, quantities and estimating; shop experience.—M.D., 74, Bartholomew Road, London, N.W. 4884

DRAUGHTSMAN, neat, quick tracer, working drawings from rough sketches, good colourist; shorthand, typing, etc.; about 12 years' varied experience; terms moderate.—Box No. 4889, BUILDERS' JOURNAL Office.

ESTATE, Buildings Manager (33), desires re-engagement; ten years' experience in mills, farms, cottages, etc., including the preparation of plans, quantities, estimates and accounts; good knowledge of timber trade; salary 3 guineas; country preferred; abstainer.—Box 4632, BUILDERS' JOURNAL Office.

FIRST Class Architectural Designer and Draughtsman, artistic and practical, experienced in planning; elevations and details, office and competition work; moderate salary.—Apply Box 4792, BUILDERS' JOURNAL Office.

GENTLEMAN, with office in Glasgow, splendid connection among architects, builders, etc., is open to represent one or two good firms; first-class references given.—Box 4893, BUILDERS' JOURNAL Office.

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W. 4951

MANCHESTER district, architect's draughtsman gives temporary assistance; experienced planner and designer; contract, detail or competition drawings.—Box 4949, BUILDERS' JOURNAL Office.

MASONRY, manager or foreman, machinery and all details, all classes of masonry work; London and country experience; terms moderate.—G.B., 38, Napier Road, Tottenham, London. 4975

OUTDOOR representative, surveyor's assistant (25), disengaged, requires appointment; had experience interviewing, canvassing, knows London well; well educated, and of good address; first-class references.—Box 4952, BUILDERS' JOURNAL Office.

REINFORCED CONCRETE.—Details, drawings, calculations, and assistance generally, rendered to architects, builders, etc., by a specialist of large experience; terms moderate.—Box 4887, BUILDERS' JOURNAL Office.

SURVEYOR'S Assistant seeks re-engagement; 9½ years with municipal engineer; exceptionally good testimonials; well up in surveying, levelling, etc., and all work appertaining to a surveyor's or contractor's office. — Box 4971, BUILDERS' JOURNAL Office.

TO Builders.—Experienced, practical Builder Surveyor undertakes preparation of estimates and settlement of accounts on reasonable terms.—Box 4957, BUILDERS' JOURNAL Office.

TO Manufacturers.—Gentleman, with valuable connection among engineers, railway companies, and contractors, is prepared to undertake London agency for one or two good firms; offices in Westminster; highest references given. — Box 4967, BUILDERS' JOURNAL Office.

WORKING shop foreman seeks re-engagement, thoroughly practical and reliable carpenter and joiner; abstainer; 7 years' ref.; age 38; wages moderate.—C. M., 16, Margett's Road, Kempston, Bedford. 4932

YOUNG Architect is prepared to assist others, at his own office or otherwise; mod. terms.—Box 4926, BUILDERS' JOURNAL Office.

Appointments Vacant.

A START in Life,—Vacancy for youth as pupil; moderate premium required, in a county architect's office.—Pryer, Clarence Street, Gloucester. 4947

ARCHITECT required to represent a large West End firm of contractors; must be a qualified man and be willing to call upon architects as representative.—Apply Box 4955, BUILDERS' JOURNAL Office.

ARTICLED Pupil—Reinforced Concrete. Required a young gentleman as articled pupil in reinforced concrete specialist's office, one with a knowledge of elementary applied mechanics, and mathematics and a taste for theory of construction and design preferred; an excellent opportunity for one willing to learn and understudy chief engineer.—Write, R. C., c/o Hastings Bros., Ltd., King's Chambers, Portugal Street, Kingsway, W.C. 4907

ARTICLED PUPIL.—Vacancy for same in old established West End firm of architects and surveyors; moderate premium; small progressive salary to suitable youth.—Box No. 4890, BUILDERS' JOURNAL Office.

OFFICE Boy wanted, by a builder, at West End; apply, in own handwriting, stating age, salary, and experience, to Box 4974, BUILDERS' JOURNAL Office.

Box 4897.—This vacancy is now filled up, and advertisers tender thanks to all applicants for letters sent. 4970

WANTED, Joiners' Foreman, for London shop of 20 men; able to estimate and work accurately to cost; used to machinery.—Box 4936, BUILDERS' JOURNAL Office.

JOINTLESS Floor Layers. — Wanted immediately, one or two good men, thoroughly experienced in composition floor-laying.—Apply, giving experience and wages required, Box 4946, BUILDERS' JOURNAL Office.

WANTED, competent reinforced concrete hands, experienced enough to act as sub-foremen.—Write, stating wages required, to D.N., Box 4944, BUILDERS' JOURNAL Office.

WANTED immediately, for Manchester district, competent surveyor, age about 25, for plane and angular surveying and levelling. Must have fair constructional knowledge. Address, stating age, experience, and salary required, to—"S. 31," W. H. Smith and Son, Advertising Agents, Blackfriars, Manchester. 4965

April 21, 1909. Volume 29. No. 741.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: Our Exhibition Number; The Soul of the Exhibition: "All in a Garden Green"; Back-to-Back Houses, 333; Town Planning, Street Statuary - - - - - - - - 334
Architects of the Day: No. 1, Messrs. Mewès and Davis - - - - - - - - - 334
British Sculpture of to-day - - - - - 337
Ancient Buildings and Modern Architecture - 338
Notes on Competitions - - - - - - - 340
The Institute Members' Club - - - - - 341
The Guild of Architects' Assistants - - - 341
Some Notes on the Exhibition and its Value: By H. Greville Montgomery, M.P., 342; by R. Frank Atkinson, F.R.I.B.A.; by A. W. S. Cross, M.A., F.R.I.B.A.; by Alfred East, R.A.; by Mervyn E. Macartney, B.A., F.R.I.B.A., F.S.A., 343; by Sir Aston Webb, R.A., F.R.I.B.A. - - - - - - - 344
The Opening Ceremony and Luncheon - - 341
Official Visits to the Exhibition - - - 346
Proposed New Works - - - - - - 346
Correspondence: The Manchester Education Committee and the Architectural profession - - - - - - - - - - 346
The Horse Guards Parade - - - - - 346
Building Exhibition: Notices of the Exhibits. By Frederick Chatterton, A.R.I.B.A., 347-400. (See also Special Index p. 348, and the indexes to the various sections.)
Tenders - - - - - - - - vi.-viii.
Complete List of Contracts Open xlv., xlvi., xlix.

ILLUSTRATIONS.

Portrait of Mr. C. Frederic Mewès - - - 334
Study for a Memorial to Queen Victoria, by Arthur J. Davis - - - - - - - 335
Portrait of Mr. Arthur J. Davis - - - - 335
Mr. Mewès's House, erected from his own designs - - - - - - - - - - 336
The Ritz Hotel, Piccadilly London. Mewès and Davis, Architects, 337. (See also Centre Plate.)
Vestibule, "Morning Post" Building, Strand. Mewès and Davis, Architects - - - 337
Staircase, Bankverein-Gebaudes, Zurich, Charles F. Mewès, Architect - - - 338
Royal Automobile Club. Mewès and Davis, Architects 338, 339, 340, 341
Portraits of Mr. H. Greville Montgomery, M.P., and Mr. H. C. Montgomery - - 342
The Opening Ceremony - - - - - - 343
Sketches at the Luncheon. By our Special Artist - - - - - - - - - - 345
Building Exhibition Illustrations 350-400

Our Exhibition Number. We present our Exhibition number in the hope that it will be found worthy of the important fixture that inspired it. It endeavours to present in an interesting and helpful manner information about the many wonderful exhibits now housed within the walls of Olympia. If it proves useful to our readers in this respect, it will have done all that we intended. And that is all we desire to say about it. For the rest it must make its own appeal and prove its own merits and recommendation. At the moment of going to press we learn that a second edition will be required; and should any delay occur in the delivery of copies, we ask the indulgence of our readers.

The Soul of the Exhibition. When one contemplates from the gallery of Olympia the great collection of structures, erections, and stands, that represent the material activities of the great building industry—new risen as it were a town in a night—one is moved to some amazement at the vast amount of effort and energy which has been expended, some feeling of pride in the fitness and completeness of the thing as it presents itself; and not a little feeling of regret that withal it has so brief a life. One is tempted to feel—there being so much that is beautiful, so much that is amazingly ingenious or useful, so much that is the outcome of patient labour and hard thinking—that a fortnight's brief life but ill requites it. There is no little sadness in the thought that the third of May will find the hand of the destroyer busy in the disintegration of what has given so much pleasure and has proffered so much information—to think that the works of Mr. Lutyens and Mr. Atkinson must be resolved into their original bricks, that the rose-clad bungalows and the little tulip beds will have vanished, and the quiet hum of life in this city of possibilities will have given place to the hammering of destruction and the ethics of the pick. There are many who will feel like that; many whose business or pleasure will take them so frequently to Olympia in the next ten days, that the inevitable end will leave them with a sense of loss—with only a memory and the sadness of recollection.

"The worldly hope men set their hearts upon
Turns ashes—or it prospers; and anon,
Like snow upon the desert's dusty face
Lighting a little hour or two—is gone."

And there are those of worldly hope, who look to the main purpose of an exhibition, to its buying and its selling, to the prospective clients it may bring, to business secured, or to that which is to come. The close may find them weighing advantages or disadvantages, gains or losses, and them perchance the undefined, intangible soul may pass beside. For as a ship must "find herself," so the soul of the exhibition must be born out of the living aims and hopes of these triple hundred stands. And that soul continues, it lives to swell the triumph of things achieved, to weigh in the credit balance of human effort—and its name is Progress.

"All in a Garden Green." The gardening instinct is no doubt most assertive in the springtime. It burgeons in sympathy with the lilac; and blossoms at the bidding of the audaciously lovely almond. It is an opportune moment for Lord Meath's newspaper letter (is it a hardy annual?) advocating window-box culture; nor has the sweet influence of the season been lost upon the "Times," whose leading columns have blossomed forth into a well-tempered encomium of "Nature in London Streets," in which, in particular, are set out some of the joys and some of the disadvantages of planting trees in towns. The chief drawbacks are, it seems, that the trees shut out too much light in summer, unless they are so lopped as to present a pitifully mutilated appearance in winter. Nothing is said of the difficulties of maintaining them in health where their roots are confined beneath artificial pavement in suchwise as to deprive them of their due modicum of moisture; nor of their sufferings from leaky gas mains and electric cables below, and the acid-laden atmosphere above and around them. Nor, on the other hand, is any account taken of the risks to pedestrians in autumn of slipping upon the dark leaves that, in the suburbs, are too often left to rot where they fall, because the scavenging department (*horresco referens*) is not always equal to the extra labour they would impose upon it. But if street trees are a boon, we cannot expect to have it priceless. Trees, the "Times" writer points out, are often a heritage from some rich man's estate, which has now been parcelled into small building plots. Evelyn of Deptford, and Tradescant of Vauxhall, could hardly have dreamt that in process of time the saplings they planted in their spacious domains would, as stately trees, menace the safety of the tiny villas in whose back gardens they now rear their disdainful heads, and whose eaves-gutters they annually choke with their falling leaves. Nasty accidents have occurred during the equinoctial gales, and more are likely to follow as the trees decay with age. This is a matter that deserves more attention than it is likely to receive. The planting of trees and shrubs in the forecourts of suburban residences is often done with as little skill as taste. When the laburnum is ablaze beside the creamy or the purple-flowering lilac, or the so-called acacia is begemmed, the villa behind them is glorified when it is not obscured; but these and other trees are too often planted in positions of which the architect would hardly approve, if he were among the growing band who deign to take such subjects into careful consideration. And so in the matter of window gardening and of climbing plants. The cultivator is usually too much concerned with the growth to care very much for the environment; and consequently that which should adorn the house too often disfigures it. The architect should study this matter—he should find it a delightful recreation—in order that he may be able to set a good example. His labour will not be wasted; for in nothing does imitation spread more swiftly.

Back-to-back Houses. The threatened extinction, in process of time, of back-to-back houses is, we understand, causing much heart-burning in Leeds. Our opinion on the subject was expressed very clearly some months before Mr. Burns made his special reference in reintroducing the Housing and Town Planning Bill; and we were roundly abused for it. We did not retort, because we have more regard for the principle involved than for any merely private interest that may happen to suffer in the process of advancing the public good. When, on the one side, we get a consensus of opinion among sanitarians of high repute, such as those eminent hygienists whose names were cited by Mr. Burns, to the effect that back-to-back houses ought, on public grounds, to be abolished, and when we find that the arguments on the other side are mainly based on a statistical method of very dubious validity, we prefer to side with the scientists. Nor can the æsthetic aspect of the question be lightly ignored. So far, we have not been told that back-to-back houses are beautiful; although that contention would not astonish us more than the claim that they are healthy. That they are cheap, we do not dispute; but cheap and nasty is a saying that seems only too likely to be justly applicable to the case in point. We would earnestly plead with the good folk of Leeds to abandon their prejudices, forsake their bad traditions, and join the rest of the community in a broader view of the situation.

Town Planning.

The advent of the Town Planning and Housing Bill has brought into being animated and interesting discussions in all our papers. The possibilities of town planning, from practical, hygienic and artistic points of view; the question of back-to-back houses; Scotch flats versus English houses; the taxation of land values; these are a few of the great controversies that find their inspiration in Mr. Burns' new measure, now past its second reading. Nor is the contemplated law in its entirety beyond the realms of controversy. Mr. H. R. Garwen Gogay, of Wimbledon, in a letter received reminds us that municipal debt has increased by about £372,000,000 in twenty-two years, and now stands at £564,645,200, a gigantic sum that he believes will quickly reach one thousand millions if this Bill becomes law. Moreover, he questions whether it will not create a huge "Works Department" in every municipality in the Kingdom "a la the L.C.C.;" whether it will not bring needless and undeserved ruin upon thousands of small property owners; whether it will not bring about universal, social and economic ruin in the near future, "and realise the Socialist's dream," by eventually making it impossible for the ratepayers to meet the charges upon this immense "unrighteous debt," which must then be repudiated. "Thus both the Socialist and the selfish Municipal financier" (who forces his "money upon municipalities everywhere, because of the security afforded by the rates") "will be hoist with their own petard." This is a formidable indictment, but, we fear, a little illogical. As the Socialist and the selfish Municipal financier seem to be Mr. Gogay's pet aversions, we suggest that on his own showing it would be desirable to let them do their worst, as eventually they would be "hoist with their own petard," and the municipal debt would be reduced from one thousand millions to nothing, the ratepayers and the community generally benefiting by all the improvements that were carried out. Still, we should be loth to support Mr. Burns' Bill, if it held for us all the awful possibilities which Mr. Gogay portends; but as far as the signs and portents go, we do not think they support Mr. Gogay's contentions. The L.C.C. Works Department and that of Leeds are now numbered, we believe, among the things that were; and Experience, continuing her excellent tutorial work, is leading our municipalities to great searchings of heart on the subject of municipal trading. That all things may be lawful; but that all things may not be expedient is a lesson that requires a considerable amount of application; but once learned is far-reaching in its benefits and influence. And one thing may be advanced against Mr. Gogay's views and that is that if Mr. Burns' Bill had been law fifty years ago the municipalities would have been spared the expense of carrying out many costly schemes, that do not add to the beauty or artistic worth of the towns, but were absolutely necessary to make them fit to live in. The aggregate cost of these improvements makes up a very large percentage of that £564,000,000 of municipal debt which Mr. Gogay mentions, and which is a ransom levied for the sins of the fathers upon their children of the present day.

Street Statuary.

It has been decided that a memorial to the late Duke of Devonshire shall take the form of a statue to be erected at the junction of Horse Guards' Avenue and Whitehall, the site having been granted by the Westminster City Council. Not many years ago, such an announcement would have been greeted with derision by the satirical section of the Press, with whom British statuary was a stock subject of stereotyped jocularity, a favourite opening phrase being, "Another statue is to be inflicted on the long-suffering British public." This warm welcome must naturally have had an inspiring effect on the sculptor. That he nevertheless managed occasionally to produce images of abiding interest was shown by Mr. M. H. Spielmann in the interesting lecture that he delivered at a recent meeting of the R.I.B.A. The lecturer, who, it will not be forgotten, is the author of the standard "History of 'Punch,'" recalled many of the caustic sayings that used to be current concerning our outdoor statuary. Much of the sarcasm could be only too easily justified; but since the advent of Alfred Gilbert and Onslow Ford, of Sir G. J. Frampton, Goscombe John, and Bertram Mackennal, British statuary has afforded but little scope for the sardonic humorist. The sculptors are well enough, and those who commission them show more enlightenment than did the patron of the previous generation; but among the bad old traditions or conventions that still linger are two that still daunt the sculptor. One is that statuary can with impunity be stinted as to cost; the other, that a life-size or colossal and full-length image of the person commemorated is essential. Outdoor statuary should be on the grand scale and in the grand manner, and should not be reduced to insignificance in an effort to keep down the expense. Many, or most, of our public groups are monuments to the meanness of our regard for art. The other convention is doubtless defensible; there is a kind of piety in the wish to keep among us in perpetuity, and in his habit as he lived, the distinguished statesman or warrior—nine times out of ten it is the one or the other—but in that case he is, at a distance, hardly distinguishable from the indifferent crowds that pass him by without so much as a glance; and the production of such a statue is merely an effort at portraiture: it gives no scope to the artist's imagination. The imaginative and artistic sculptor would infinitely prefer the greater freedom accorded in some Continental countries, where a modest bust or medallion of the hero is surrounded by larger embodiments of his achievements or his creations, or by figures emblematic of his career and character.

Architects of the Day.

No. 1. Messrs. Mewes and Davis

(Note.—In continuing an old and popular feature of "The Builders' Journal," known as the "Men who Build" series, we have adopted a more consistent and appropriate title. The old one we shall require, in the near future, for another series dealing with the work of our big contractors.—EDITOR.)

Mr. Charles Frederic Mewès was born at Strasbourg, January 30th, 1858, entered the Ecôle des Beaux Arts and became a pupil of Pascal in 1878. In 1885 he was the second *logist* chosen to compete for the *Prix de Rome*, and in the following year was given the diploma. In 1892 he was elected a member of the Société des Architectes Francais, and two years later awarded the *grande medaille* of this society for domestic architecture. He was one of the architects of the Exposition of 1900, and was chosen to design the *Palais de l'Economie Sociale et des Congrès*. Following the Exhibition he was honoured by being made Chevalier of the Legion of Honour, Chevalier of the Order of Saint Anne of Russia, and Officer of the Order of Saint Jacques of Portugal. His principal works include the Banque de Mulhouse at Belfort, Banque de Mulhouse at Colmaz, Banque Internationale of Brussels, Schweizrischer Bankverin at Zurich, Bank of Speyer and Co., at Bâle. The Orphelinat des Alsaciens-Lorrains at Vésinet (Seine et Oise), the Hotel Ritz at Paris, Hotel Ritz at Madrid (in partnership with M. de Landecho), Hotel Marie-Christina at San Sebastian (in partnership with M. de Urcola), the great "Hydro" at Contrexville (Vosges), Château of Rochfort-en-Yvelines (Seine-et-Oise), Chateau de la Chartreuse à Thoune, Château de Bois-Sallir (Mayenne), Château de Varcoucier (Mayenne), restoration of the Château de la Boissière (Siene-et-Oise). Of the great number of residences designed by Mr. Mewès, it will be sufficient to mention a few of the more important ones. His own house in the Boulevard des Invalides has always appealed to the writer as possessing one of the most charming city house fronts in Paris, and that of Mr. Charles Ferry at the corner of the Cours la Reine and Rue Bayard is a notable composition To these must be added the town houses of Mr. W. K. Vanderbilt and of the celebrated actor, Lucien Guitry, the latter a charming example of good taste and refinement, and displaying the power of reserve that comes only after vast artistic experience and as the result of much thoughtful study.

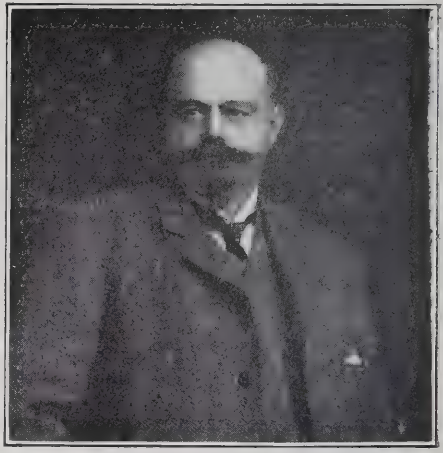
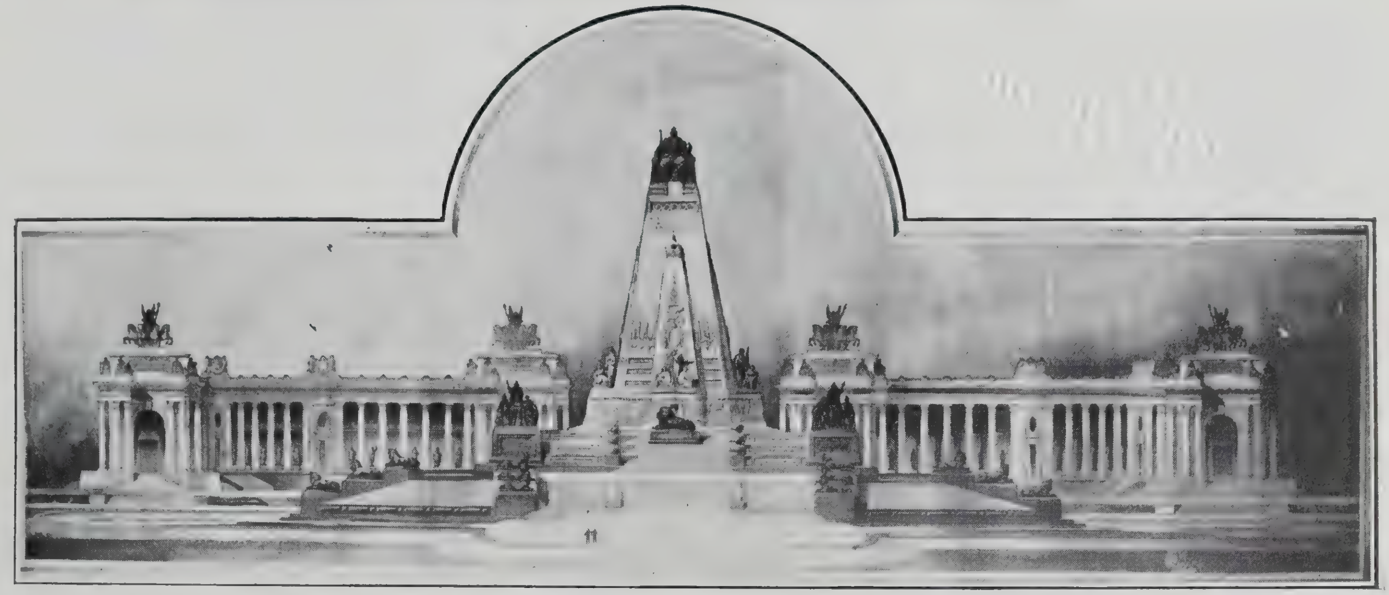


Photo: Langfier,

MR. CHARLES FREDERIC MEWES.

Mr. Arthur J. Davis, the junior member of the firm of Mewès and Davis, is an Englishman, born in 1878, and, his partner, a pupil of the distinguished *Membre de l'Institute*, J. L. Pascal. The partnership exists as regards work in England, of which Mr. Davis takes charge, and the number of build-



STUDY FOR A MEMORIAL TO QUEEN VICTORIA. ARTHUR J. DAVIS, ARCHITECT.

ings designed by them are among the very good things built during the last decade in this country. Their first work was the rebuilding of the interiors of the Carlton Hotel in London, and the country houses Coombe Court, Surrey, and Luton Hoo; the town houses of Mr. Gubenkian, Mr. Koch, and Mr. Spitzel, all in London; the decorations of the steamship *Amerika* for the *Hamburg-Amerika Linie*, the shop of Boucheron at the corner of Dover Street and Piccadilly, and the alterations to the Cavalry Club in Piccadilly. But the best known of their works in London are, of course, the fine buildings of the Ritz Hotel and the "Morning Post," which have been illustrated in our pages, and are well-known to readers.

More interesting than either of these, because more monumental and more classical in the influence of design, will be the new Royal Automobile Club in Pall Mall on the site of part of the group of old buildings formerly occupied by the War Offices.

It is not long since a layman wrote an article for one of the daily papers upon modern London architecture, which attracted more than the ordinary attention given by the profession as a whole to the criticisms and comments of a non-professional writing upon a subject about which so very few laymen can ever write without betraying more ignorance than information. The article to which we refer appeared in the "Daily Mail," and it "handled without gloves" a number of the recent efforts of very distinguished architects, apparently with the object of condemning artistic experiment as applied to important civic architecture, and to uphold that which is the representation of the accumulated knowledge of what is good in art, obtained as the result of centuries of such experiment. The writer seemed to assume that the comparative standard has become, as regards at least entire buildings, especially such as are built in a "style," practically an absolute one. That is to say, that without having any other building in mind, one might say of a given edifice: "This is good," or "That is bad," depending wholly upon how it conforms, not to rules which vary, but to accepted principles which do not vary. To illustrate the point, one may state the rule of the Ionic column of the Classic architecture of convention as being nine diameters in height, but we know that in special circumstances it may be as few as seven or as many as fourteen diameters and produce a satisfactory result. Thus, the column of fourteen diameters, say sixty feet high, may look well as part of a facade in a very narrow city street, and one of only seven diameters may not be bad if it is perhaps six feet high and part of a basement treatment. But the principle that in a colonnade over an arcade the columns must bear some symmetrical relation to the points of support below is invariable. Without the admission of such principles as hypotheses we cannot conclude that there is any such thing as art in architecture, and it is only by the acceptance of such principles—which are axiomatic to the discerning mind, and need but little demonstrating to convince the less acute of their truth—that architecture, or any other art, can exist as such. Now, however much we may differ from the writer of the newspaper article as regards *taste*, we can none of us fail to recognise the exceptional power of observation combined with an incisive style of telling what he saw, or the accuracy of his statements in *theory*. Whatever our predilection and prejudices, an examination of a very great deal of recent London architure could hardly fail to lead us to almost the same conclusions as those of this layman —a layman, however, especially interested in *art*. Among the things which he found admirable were mentioned, especially, the buildings of the "Morning Post" and the Ritz Hotel, both of which are modern in design, French in influence of style, refined in character, and the work of Messrs. Charles Mewès, of Paris, and Arthur Davis, of London.

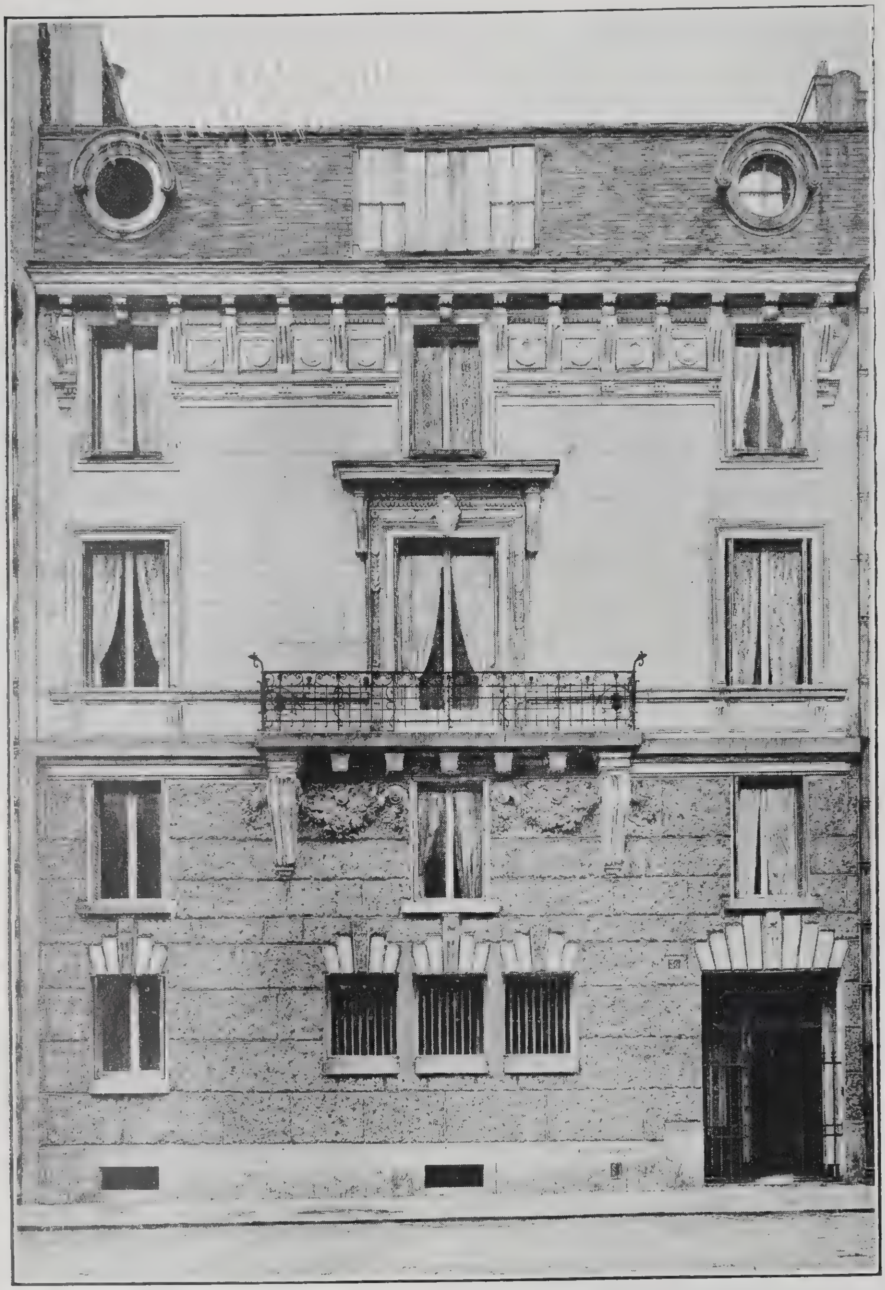
Photo: La

MR. ARTHUR J. DAVIS,

Because of their simplicity, neither the Ritz Hotel nor the "Morning Post" buildings are such as one might expect to attract the attention of either the people or an English art critic; yet they have done both, as well as achieving more than passing attention from professional architects, and have met with such general approval that there can be but little doubt that in a short time the influence of the Ecole des Beaux Arts—of which these indicate the commencement—will be as potent a factor in the architecture of England as it has been during the past fifteen years in that of the United States. So far, at least, as the monumental architecture of the country is concerned, nothing could be more welcome, with the saving clause that the best French works be allowed to serve as models, and that "Art Nouveau" and the other vagaries do not become an accompaniment.

Another example of the French influence will soon be found in Pall Mall, on a part of the site occupied by the old buildings—formerly the War Offices—between the Carlton Club and St. James's Palace grounds, in the new home of the Royal Automobile Club.

Pall Mall (though it exhibits a few aberrations) has been more fortunate than most of London's principal streets, in so far that the newer buildings have been for the most part at least the equals in design of the older structures which they have superseded. English sentiment breeds reverence for anything that is old, regardless of whether or not the object be worthy of it; which, as far as architecture is concerned, may be understood when one looks upon the good, if commonplace, old structures, and then upon the pretentious alleged "improvements"; one grasps in an instant the national antipathy to "improvements," sympathises with it, and gives the protesting public credit for at least good judgment. The old War Offices were just such commonplace old buildings, with nothing remarkable about them—only plain—not particularly refined, just inoffensive, and the improvement will be a real one. The Royal Automobile Club is to be built from the designs of Messrs. Mewès and Davis, architects, with whom is associated Mr. E. Keynes Purchase, the honorary architect of the club. Few modern buildings afford such opportunities for the display of an architect's abilities as does a club-house, for which there are many obvious reasons. There is, for instance, no opposition party demanding an investigation of every penny spent upon those details and materials which come beyond the range of "rigid economy," usually the bane of the architect's existence when he is working upon the plans of a building that is to be erected from funds gathered by the tax collector. Neither is there the trouble of educating the client from "Victorian Gothic" to sobriety, nor the diplomatic labour necessary to convince his clients' female relations that his design cannot be materially improved upon—and cheapened at the same time—by adopting all of the suggestions set forth in the architec-



MR. MEWES' HOUSE, BOULEVARD DES INVALIDES, PARIS: ERECTED FROM HIS OWN DESIGNS.

tural (?) section of some newspaper for ladies, which are sometimes brought to bear against his ideas as to domestic work. Perhaps most fortunate of all is the fact that this is in no sense a commercial structure. An important social club—especially an Automobile Club—implies a certain assumption of the wealth of its members, but differs from an expensive hotel, in that its object, avowedly at least, is not primarily to make money; and, therefore, it need not vie with its neighbours in pretensions to luxuriousness for the sake of the advertisement entailed. Besides, a degree of intelligence may be expected of the members of its committee not so likely to be found in those charged with the erection of public or ecclesiastical or commercial structures. The club committee are less likely, either, to leave the architect without information as to what is required, or to goad and hamper him with unreasonable conditions and restrictions. A member of such a committee could never be selected from the ranks of resolute busybodies, even if by some mischance such had been admitted to membership. Hence obstructive interference or excessive individuality is improbable of intrusion upon the domain of the architect, and he is left with an almost ideal problem to solve. He is given the site, the approximate number and kind of rooms for reception and entertainment, for accommodation of members, and for service. The engineering detail, if more complex, may be less in evidence than is usually necessary in other large buildings. Participating at once in the nature of the domestic and public building, it is the least of each and the highest type of both—the ideal of practical socialism; the home of good form and refinement; the child of precedent. Personality, if not discountenanced, is at least undesired; and extraordinary originality, especially if it leans to eccentricity, is *not* clubable. The character of its architecture must be dignified, the style correct, and the individual element in design which makes a home charming to one person and unbearable to another should be eliminated from consideration. Impersonal, if not strictly monumental, architecture has been the rule for the best clubs of the West End, high Renaissance being the type of design which has prevailed in Pall Mall. Of the clubs extending from Waterloo Place to St. James's Palace (which includes the Athenæum, Travellers', Reform, Army and Navy, and Carlton), the facade of the Travellers' is based upon the design of the Pandolfini Palace in Florence, and that of the Carlton upon the Library at Venice, and the Reform and Army and Navy, upon places at Rome and Venice. The Royal Automobile Club, which will adjoin the Carlton, follows the precedent more or less adopted by the other clubs, and owes its inspiration to the former Hotel Crillon-Coislin—now the Automobile Club—in the Place de la Concorde, Paris. It would be difficult to find a more beautifully studied example of modern architecture than the fine fronts by Gabriel facing the Place de la Concorde—there are two buildings, exactly alike, the former Hotel Crillon-Coislin and the Ministere de la Marine—second only to Perrault's colonnade of the Louvre, if, indeed, to that. This is amongst the finest columnar facades in the world. It is extremely improbable that any Classic design to equal this will be built in England during the lifetime of anyone now living, so that any architect who would emulate Gabriel must needs do so in much the same spirit that he might attempt to emulate the Parthenon or the Sainte-Chapelle to attain as near as the conditions permit the same character of refinement, simplicity, and strength.

This character is expressed to an unusual degree in the design for the new Royal Automobile Club. It is large in scale, an essential to monumental effect; the proportions of the *travée* are nearly the same in elevation as those of the buildings by Gabriel, but the effect will be quite different in perspective, due to the column being engaged instead of part of a free screen. Again, in elevation, the central feature of the new building is similar to the end pavilions of the old; but the effect here will also be different. In the French example the corner columns under the pediments are engaged to the pylons, and the two middle ones, though free, are only a half diameter from the pilaster behind. In the building to be erected in Pall Mall, the corner columns will be a half diameter in front of a pilaster on the corner of the pylon against which the portico returns, while the middle ones are in screen, due to the wall face being recessed below the pediment to form a loggia. This latter effect is usually a weak one, giving, as a rule, the impression of two buildings joined together; but the present treatment with the pylons at the ends, and those at either side of the pediment brought to the same face, slightly in front of the bases of the columns, and the mass of masonry forming an attic behind the pediment, projecting beyond the face of the pylons, will produce the effect of a strong frame of masonry round the void in the centre, and will appear effectually to unify the whole front.

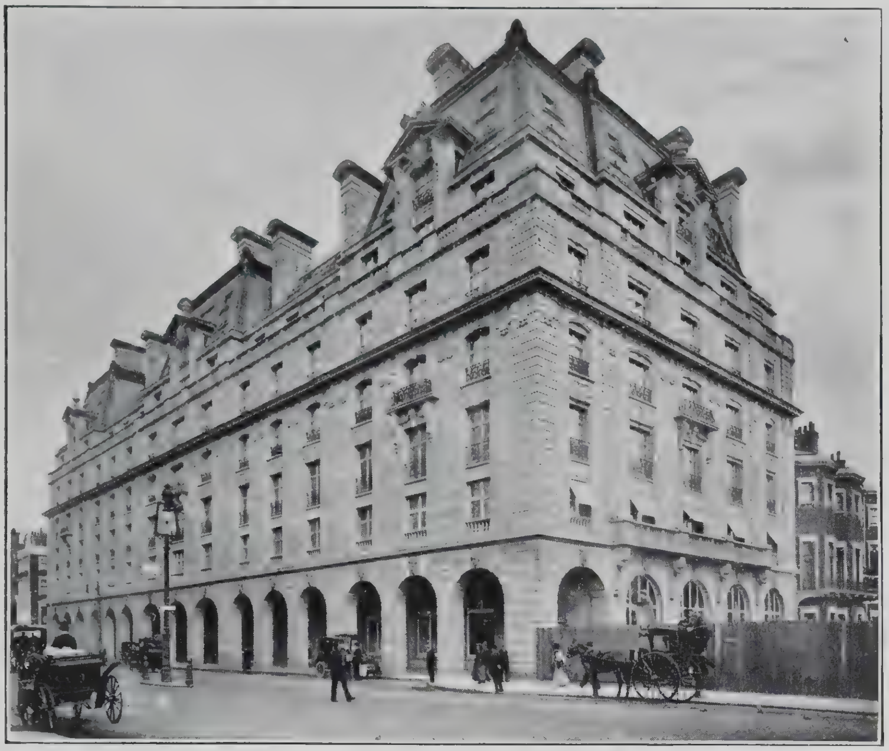
Internally, the building is treated in the "grand manner." There is an uninterrupted vista from the Pall Mall entrance through to Carlton House Terrace. The elliptical vestibule is 48ft. by 32ft., and runs through two storeys, and is 50ft. high to the ceiling over the central portion. The dining-room at the east end, and the club room at the west, are each 93ft. by 35ft., and the "lounge," which on occasions may be used as a lecture-room, is 108ft. by 40ft., including the platform, and 35ft. high. The basement contains a gymnasium and extensive baths, which are accommodated in rooms 28ft. high. Included in the baths is a swimming pool 30ft. by 75ft.

The Royal Automobile Club will be the first important club building built in London for several years. As architecture, it bids fair to rank high among the best work of this century in England.

Next week we shall give further particulars and illustrations of work by this firm.

(*To be concluded.*)

Messrs. Richard Moreland and Son, Ltd., give notice that they have removed their engineering works from Old Street to Silvertown. Their general offices will still remain at 80, Goswell Road, London, E.C



THE RITZ HOTEL, PICCADILLY, LONDON.
MEWES AND DAVIS, ARCHITECTS.

BRITISH SCULPTURE OF TO-DAY.

At an ordinary general meeting of the Royal Institute of British Architects, Mr. M. H. Spielmann, F.S.A., delivered an interesting lecture upon "British Sculpture of to-day." Having observed that, in justice to himself, he would like to explain that the present paper was an attempt to compress three lectures into one, Mr. Spielmann said that his object was not primarily to deal philosophically with the theory of sculpture. For the short space of time at his disposal he would like to summarise as concisely as possible the progress of British sculpture during the last thirty years.

Since 1875, a great change had come over the art in England; and, to-day, the British school found itself upon a level that thirty years ago was quite unhoped for. The followers of this, perhaps the most unappreciated art, had no tradition upon which to base their own work; but they had for leaders such splendid men as Frederick Leighton, Alfred Gilbert, and Onslow Ford.

Going back for about sixty years, it was interesting to observe the curious method then employed of commemorating the careers of great personages, and establishing their fame for all time. For many people it was a matter for continual speculation why the Admiral should be "mast-headed" in such a mortifying way in Trafalgar Square. Again, few could properly appreciate the wisdom of placing an effigy of the Duke of York upon a lofty column, and striking through his brain a lightning conductor. True, some had gone so far as to suggest that the latter could be used most appropriately for the purpose of filing the Duke's many undischarged accounts; but this, to say the least, was an invidious proposition. It had been remarked, in regard to the equestrian statue of George the Third in Trafalgar Square, that "never was there so drunken a horse with so sober a rider." The story of this statue was a curious one; for few were aware that it was originally a representation of St. George and the Dragon. The dragon was not considered an indispensable accessory, however, so it had been removed; and there they had at once a memorial quite befitting the noble monarch. Thackeray had once taken a French acquaintance to see it. After gazing at it for a few moments in silence, the Frenchman exclaimed, "Waterloo is avenged!"

How utterly deficient in the quality of appreciation of all pertaining to art the British public were, was common knowledge. Ignorance was the monopoly of no particular class, however, and it was notably pronounced in the official section of the community where one would least expect to find it. Bad taste was everywhere observable; and, for excelling in this respect, committees which commissioned statues manifested an unusual aptitude. Above all, it was most desirable to remember that nothing should be done which might tend to disturb the delicate imagination of the artist; for sculpture, like its sister art architecture, was a subject of harmony and of science.

The present aim of the modern school was to impart life without any undue straining after realism. It was, perhaps, not very surprising that sculpture was misunderstood in England. The eye was more easily attracted by colour than by form, and this was the chief argument to be advanced to account for the apparent ineffectiveness of sculpture. It was not an imitative art, but an expression of design and form without colour, atmosphere, or tone. In this respect the painter possessed a great advantage over the sculptor. Whereas the former could adapt his brush practically to any subject, the latter was more restricted and his scope more confined.

The work of Alfred Stevens was a revelation, and it included some of the finest of

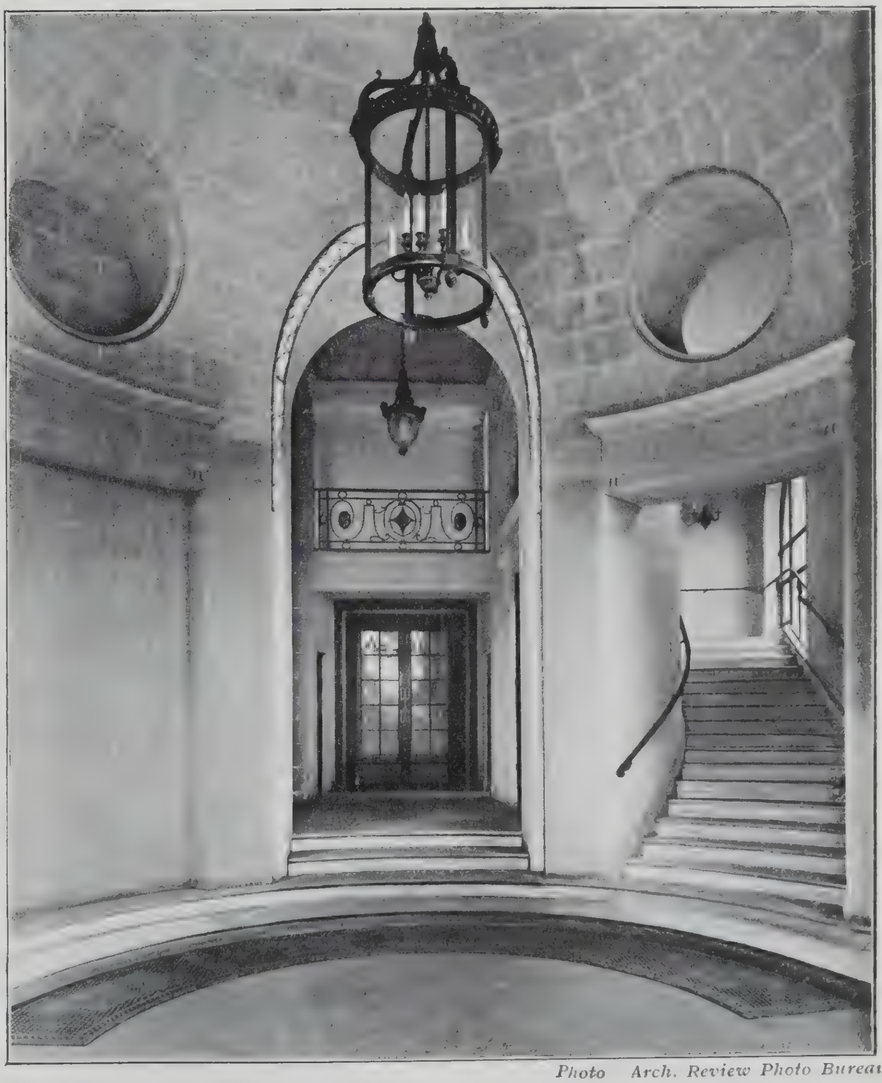
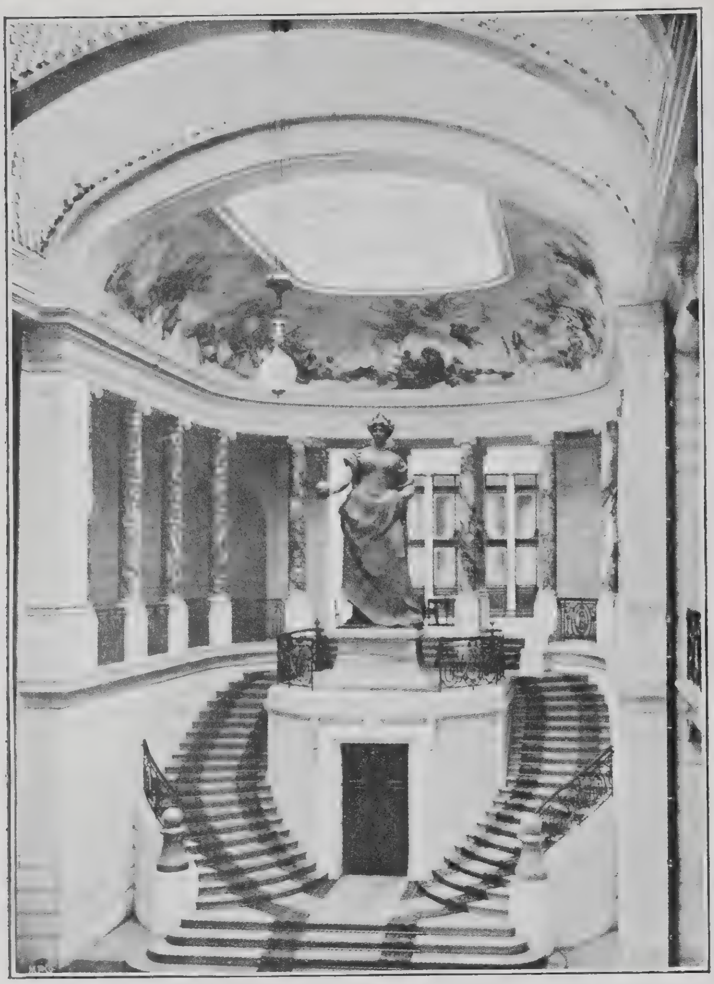


Photo Arch. Review Photo Bureau

VESTIBULE, "MORNING POST" BUILDING, STRAND, LONDON.
MEWES AND DAVIS, ARCHITECTS.



STAIRCASE, SCHWEIZRISCHER BANKVEREIN, ZURICH.
CHAS. F. MEWES, ARCHITECT.

which the British school could boast. He was a man who, it might be almost said, possessed the power to instil life into lifeless clay. Although a follower of Michelangelo, Stevens was no copyist. His work was original throughout, and had quite a distinctive character of its own. A great deal of his success was, beyond doubt, attributable to his sound knowledge of construction and of architecture. Very few people were aware of the existence of one of Stevens's most remarkable designs. He referred to the feet of the refreshment tables at the South Kensington Museum; and all who could should avail themselves of the first opportunity for examining them. Any time thus devoted could not possibly be wasted, as the knowledge gained would amply compensate the outlay.

Slides of the works of many famous modern British sculptors were thrown upon the screen, the lecturer describing and criticising both lucidly and sympathetically each example as it was shown.

Chief among the eminent sculptors dealt with were the following:—Alfred Stevens, John Foley, H. H. Armstead, George Lawson, T. Brock, Frederick Leighton, Sir Charles B. Lawes, Hamo Thornycroft, H. Thomas, Onslow Ford, John Swann, Alfred Gilbert, Harry Bates, Sir George Frampton, Henry Pegram, Alfred Drury, Pomeroy, Albert Tofts, Goscombe John, Bertram Mackennal, W. Colton, David McGill, Derwent Wood, and Albert Hodge.

Discussion.

Mr. Goscombe John, R.A., in proposing a vote of thanks to Mr. Spielmann, observed that it was a very great delight to them all to listen to so uncommon a thing as a lecture upon sculpture. With his exceptional knowledge of the subject, Mr. Spielmann was pre-eminently competent to deliver such a lecture. Of all the arts, sculpture appeared to have most difficulties to contend with, from the point of view of public recognition and appreciation. Truly, the technical side held more perplexities to the outsider; but it was impossible to estimate the exact result of pure technique and of sentiment.

Mr. W. Colton, in seconding the vote of thanks, said that the English were a diffident race, and sculpture had never before stood in such need of capable spokesmen as it did to-day. He felt that Mr. Spielmann was the only really able spokesman they had; for he loved sculpture for sculpture's sake. There was a decided tendency to mutilate sculpture; and it was more particularly observable at exhibitions, where this destructive inclination was allowed to run riot. Concluding, the speaker firmly believed that if sculpture was to succeed, it must be criticised in a friendly spirit.

Mr. H. H. Statham, in supporting the vote of thanks, observed that he was old enough to remember the long rows of busts of no particular merit, which, in days gone by, could be seen at the Royal Academy. Great improvement was being made, however, and work of a really praiseworthy character had now displaced the old ineptitudes. He was afraid that sculpture could never be a very popular art. It seemed to him that the great object of sculpture was to express an abstract thought in an abstract way. In regard to dress, he was of the opinion that delicate folds of drapery lent themselves to more satisfactory treatment in bronze than in marble. It struck him that the manner in which the French surmounted difficulties in regard to monuments was both commendable and desirable. The whole figure was not given, but merely a medallion of the head; the various subsidiary figures being placed around. To one work of Gilbert's, Mr. Spielmann had not referred. He believed it was called "The Dream," but of this he was somewhat uncertain. It comprised the nude figure of a woman seated in an antique chair, while round her head hovered an angel. He believed the conception had never got beyond the stage of a clay model; but it was a remarkable work, and a photograph which he possessed he dearly prized.

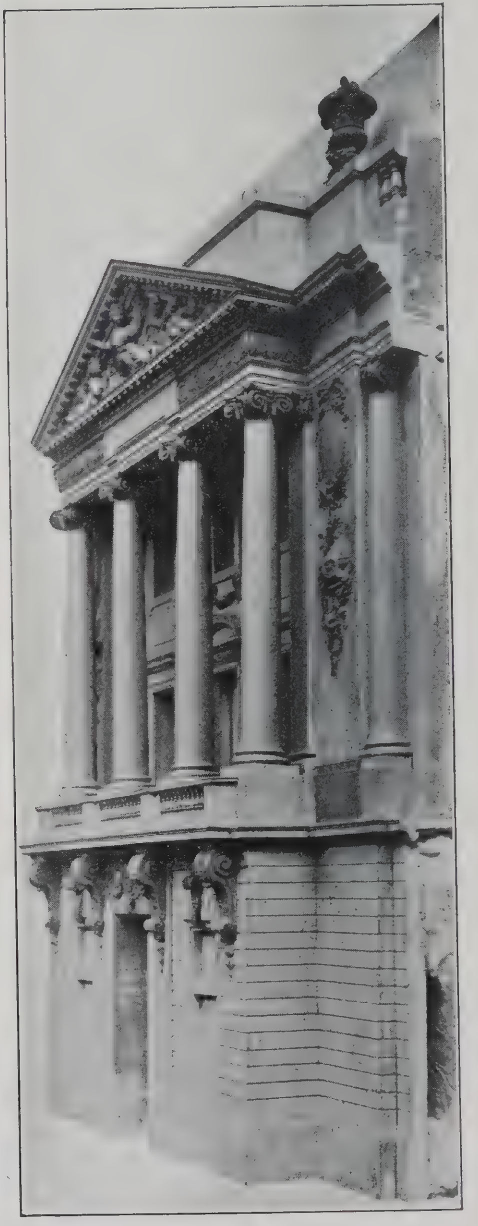
Mr. Ernest George said they were all deeply indebted to Mr. Spielmann for his most interesting lecture.

Mr. Spielmann, responding to the vote of thanks, said, regarding Mr. Statham's reference to the work of Gilbert, he believed that the correct title was "The Magic Charm." Gilbert had never considered it worthy of himself and had destroyed it.

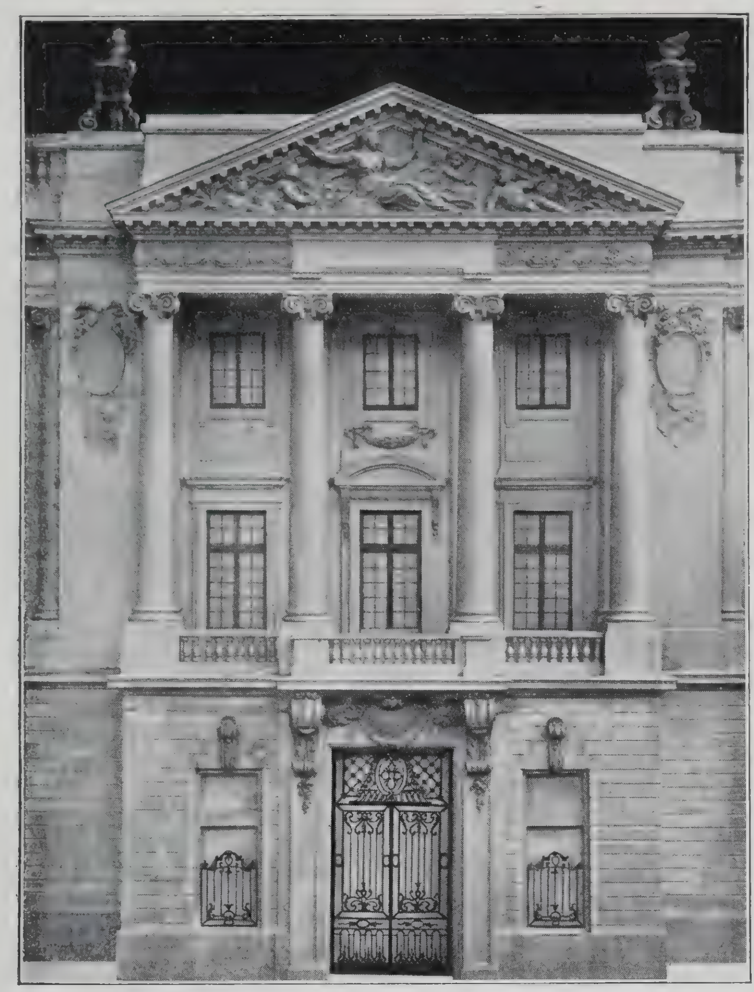
ANCIENT BUILDINGS AND MODERN ARCHITECTURE.

Mr. Thackeray Turner, F.S.A., lecturing at the Carpenters' Hall on "Ancient Buildings and their effect on Modern Architecture," said that the thought that ran through his paper was the question of copying. Man's nature being of two sorts—animal and spiritual—the arts chiefly denote the spiritual element.

A man can go through the world ignorant of the arts of music, painting, etc., but he



A PRELIMINARY STUDY FOR THE ROYAL AUTOMOBILE CLUB, PALL MALL.
MEWES AND DAVIS, ARCHITECTS.



REVISED STUDY FOR ROYAL AUTOMOBILE CLUB, PALL MALL. LONDON. MEWES AND DAVIS, ARCHITECTS.

cannot avoid architecture. No matter whether in the country or in the town, he cannot help seeing the house of God, and the house of man. There can be no doubt of the great influences of our surroundings; and it therefore seems absolutely necessary that we should admit the great importance of all buildings affecting man. If the building is good, it will do good, but if bad, then assuredly it will do harm. How great a responsibility then lies on the architect! But a great responsibility also rests on the layman. The architect can do a great deal; he has the whip hand, but he has to conform to public opinion.

If we have a wide knowledge of the architecture of our country, we must have noticed one remarkable characteristic of the Mediæval buildings, whether cathedral, cottage, farm-house, or manor-house, they all beautify the face of nature. Now, ninety-nine out of a hundred buildings that are put up disfigure the town or country, and are an eyesore.

In considering the effect of old buildings on modern architecture, it cannot be too clearly understood that an archæologist is not an architect. A man, if he is a good archæologist, is apt to be a bad architect. About the middle of the 18th century, when the Renaissance was in its last gasps, the romantic qualities of Mediæval architecture began slowly to gain a hold on the nation. The Gothic revival coincided with the revival of the Established Church, and many people to day look upon Gothic architecture as purely ecclesiastical work. The Gothic revivalists, however, sought to see every building in one style.

In building, nowadays, we cannot avoid the mechanical nature of the work done by our men. This is no fault of their own, for they are little better than machines; and if we bear this in mind, opportunities may arise of mitigating it. One of the fundamental ideas of the restorers was, that if we had a beautiful building, we had only to make copies and our new buildings would be beautiful. We cannot, however, have a work of art without creation. The question of copying is, in the lecturer's opinion, the key to the question of how we are to approach modern architecture. If a building is designed in 13th or 14th century style, the beholder will unconsciously have his mind taken back to that period, and mentally compare it with the past. He knew of no building that would bear the comparison.

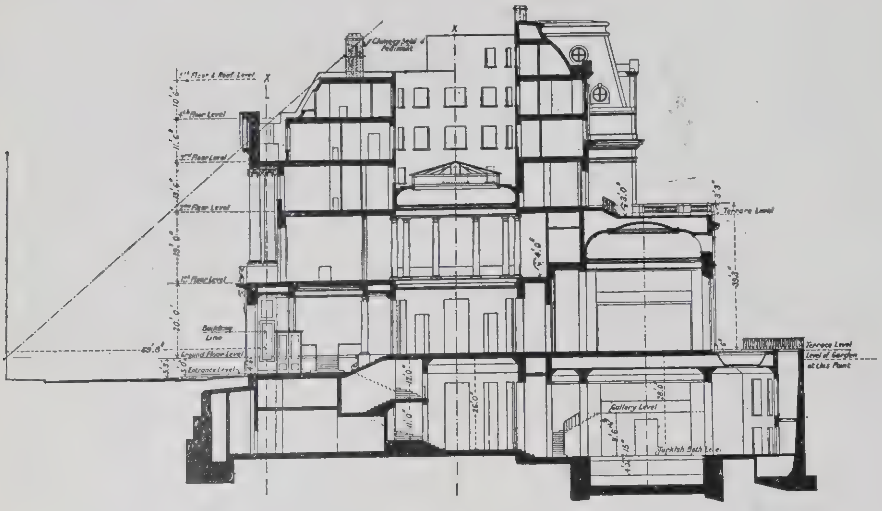
One of the most striking facts about modern architecture is that no two buildings are alike. He need not say how we build now. We all know only too well the rows of hundreds of houses all built from the same plans. Now-a-days, one man thinks for hundreds of workmen.

Comparing our modern methods with those of the Mediæval builders, Mr. Turner remarked that with us symmetry is an essential. Not so with them; they paid no attention to accuracy; but we cry out if a wall is one inch out of the straight. The modern bricklayer takes care that all the brickwork is of the same colour, and that the bricks of every other course come over one another. In Mediæval brickwork we find just the opposite.

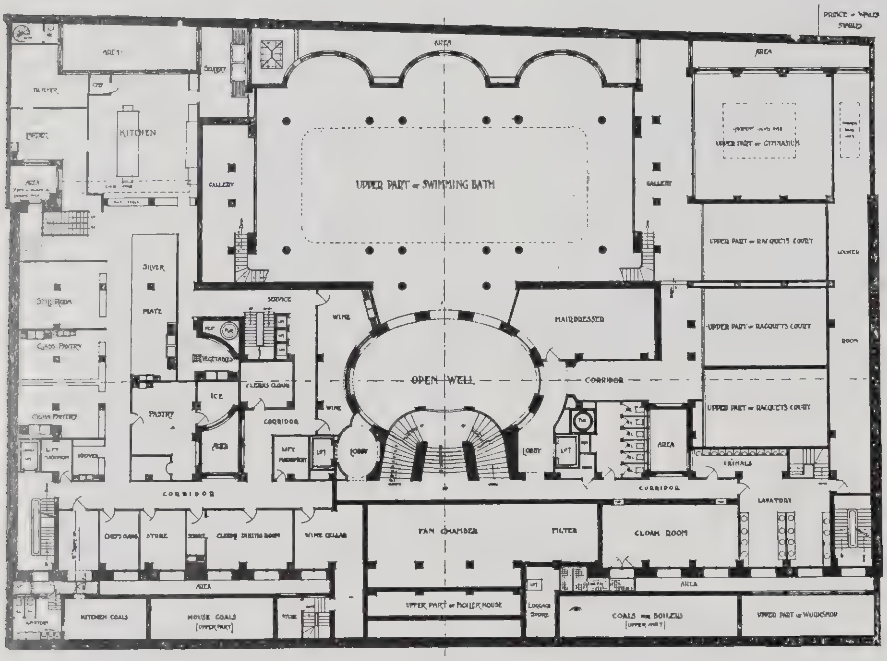
The "restoring" architect, when he has an ancient building placed in his hands, thinks how he can improve it. The "repairing" architect seeks to preserve its truths. Any man who devotes his energy to repairing ancient buildings properly will become a good builder. An architect's duty in planning a new building is (1) to plan it to suit its purpose, and (2) to study the construction carefully, so that it may last, and see that the weights are distributed according to the foundations; but he must at the same time bear in mind that his building must make a pleasing block. If he does this successfully, the result will be fine architecture, although there is not a single ornament on his building. It is only when decorative features are copied that the question of style comes in.

It is often said that you cannot invent a new style. Few things are more offensive than a striving after novelty. Probably building materials are of more importance than anything else in architecture; yet, strange to say, they seem to have received less thought and care than any other side of the question. If ancient buildings were properly studied, it would be seen how much they depend on construction, the right use of materials, and, in Mediæval buildings, their lack of symmetry. The old builders did not have one man who ordered the carrying out of the whole building down to the smallest detail; and no one knew who built the fine buildings of old days, but every workman knew his part. We may say: How can we do without the architect? One thing the architect can do is to use the brains of other people. He should try to inspire others, and get artists to do good work for him. It is not reasonable that one brain should do all the thinking.

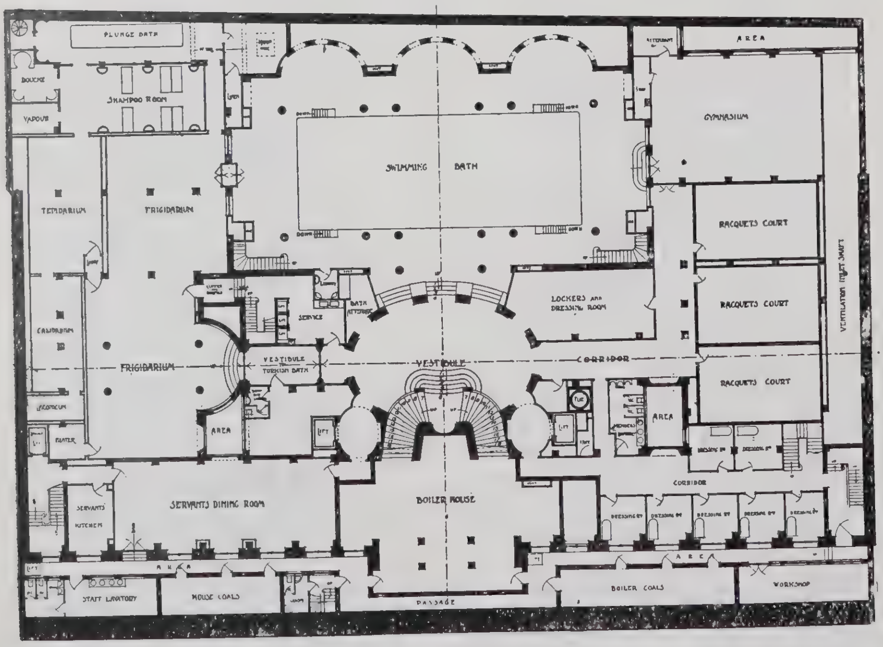
STUDIES FOR DETAILS. ROYAL AUTOMOBILE CLUB, LONDON. MEWES AND DAVIS, ARCHITECT



Section.



Lower Ground Floor Plan.



Basement Plan.

THE ROYAL AUTOMOBILE CLUB, PALL MALL, LONDON. MEWES AND DAVIS, ARCHITECTS.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
May 1	RESIDENCE FOR ASSISTAN MEDICAL OFFICER, BRIGHTON WORKHOUSE. The Guardians invite competitive designs for the above from Architects practising and having offices in the Parish of Brighton. Conditions and site plan, from B. Burfield, Clerk to the Guardians, Parochial Offices, Prince's Street. Brighton.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading, Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second, and third respectively. Assessor: Mervyn E. Macartney, F.R.I.B.A., F.S.A.
July 31.	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	BOURNEMOUTH BRANCH PUBLIC LIBRARY. Architects practising in the County Borough of Bournemouth are invited to submit designs for a new Branch Library at Boscombe. Particulars from Charles Riddle, Borough Librarian, Central Library, Bournemouth.
No date.	WALLASEY U. D. COUNCIL. CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

The Court of Common Council (London) have adopted the report of the Officers and Clerks Committee recommending that the maximum salaries of the women sanitary inspectors should be increased to £200 per annum, to be reached by annual increments of £10. It was further decided that the salary of the third woman inspector should begin at £120 per annum, and rise by annual increments of £10 to the maximum of £200.

* * *

At a meeting of the Winchester City Council, an offer was considered from the Dean and Chapter of Winchester Cathedral to present to the city the stone screen designed and erected in the reign of Charles I at the entrance to the choir of the Cathedral by Inigo Jones. This screen was removed in 1820 to make way for a stone Gothic screen. Inigo Jones's work was stored in the triforium of the south transept, from which it was recently removed owing to its great weight, which added danger to that part of the building. The Council accepted the gift, and will shortly proceed to consider its re-erection on public property.

* * *

Messrs. Henry Adams and Son, of 60, Queen Victoria Street, E.C., have been appointed consulting engineers to the Committee for the proposed bridge over the river Wey, at Guildford, for which Messrs. Clemence and Moon's design was accepted out of seventy-five sets submitted, and under whose superintendence it will be erected.

THE INSTITUTE MEMBERS' CLUB.

A meeting of the above will be held in the Smoking-room of the R.I.B.A., to-morrow, Thursday, April 22nd, at 6 p.m.

THE GUILD OF ARCHITECTS' ASSISTANTS.

The Council has issued a manifesto of the objects of the new Guild, which are set forth as follows:—

1. The consideration and settlement of all questions relating to the interests of Architects' Assistants.
2. To secure a recognised scale of salaries for Architects' Assistants.
3. To organise an employment bureau, and a system of unemployed insurance.
4. To promote the formation of a Federal Council, consisting of representatives of existing Architectural Societies in the United Kingdom, to deal with all questions connected with the profession.
5. To co-operate with existing Societies for the protection of the profession.

The proposed annual subscription is half-a-guinea. All information required will be given by the Secretary, 60, Idmiston Road, Stratford, London, E.

Upon the instructions of Mr. Watts-Dunton, Mr. J. Drury, sculptor, Chelsea, has prepared a plaster cast of the late Mr. Algernon Charles Swinburne's features preparatory to executing a marble bust.

* * *

Mr. Gordon L. Wright has removed to No. 30, Frederick Street, Edinburgh, from 122, George Street, Edinburgh. The telephone number remains the same—4007 Central.

* * *

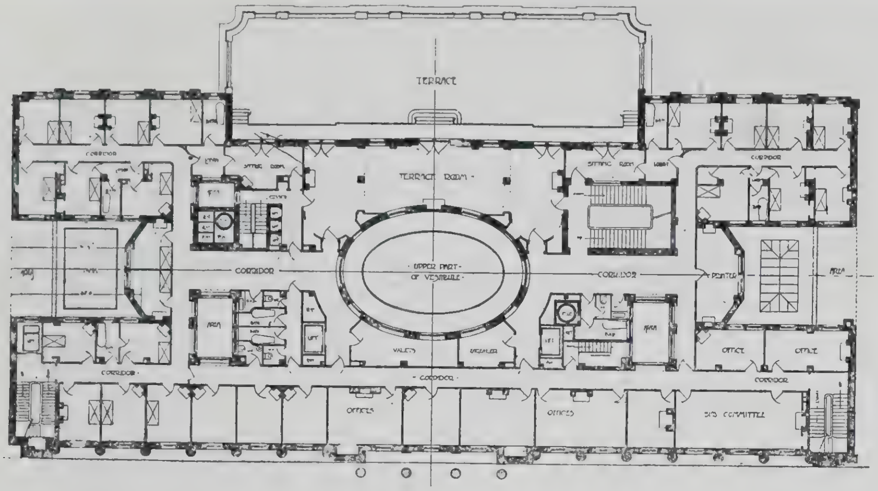
Mr. Vere Sussex Hyde, of Kew, Surrey, son of Mr. R. Singer Hyde, M.S.A., senior partner of Messrs. Singer Hyde and Son, architects, of Worthing, has commenced an architectural practice at 11, Defoe Avenue, Kew Gardens. Mr. Hyde has been specialising in the science of fire-protection, and the design of fire-resisting buildings, and has had a varied experience in warehouse, factory, and domestic work.

* * *

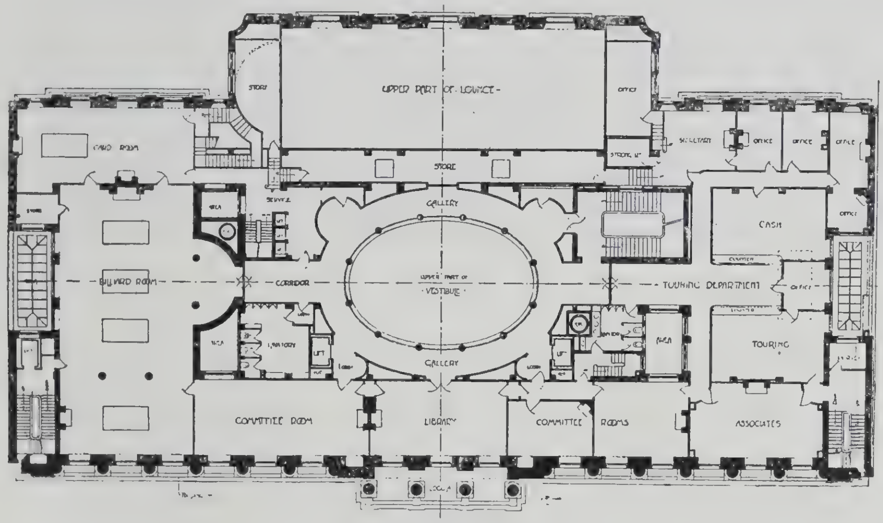
We have received from the Adjustable Shelving and Metal Construction Co., Ltd., of Gwydir Chambers, 104, High Holborn, W.C., a copy of their new illustrated catalogue setting forth an entirely new system of internal construction for libraries, warehouses, etc., and describing their space-saving fittings for all buildings where books, documents, or goods are to be stored. The chief advantages claimed for the system are: the easy and rapid adjustability of the loaded shelves, effected by an ingenious non-mechanical device; the interchangeability of all parts; the great saving of space which it effects; its fire-resisting character; and the low price in comparison with other systems. It is stated that a large number of buildings have already been erected and installed on this system, not only on the Continent of Europe, but also in America. The illustrations with which the catalogue abounds show very clearly all the details of the system.

* * *

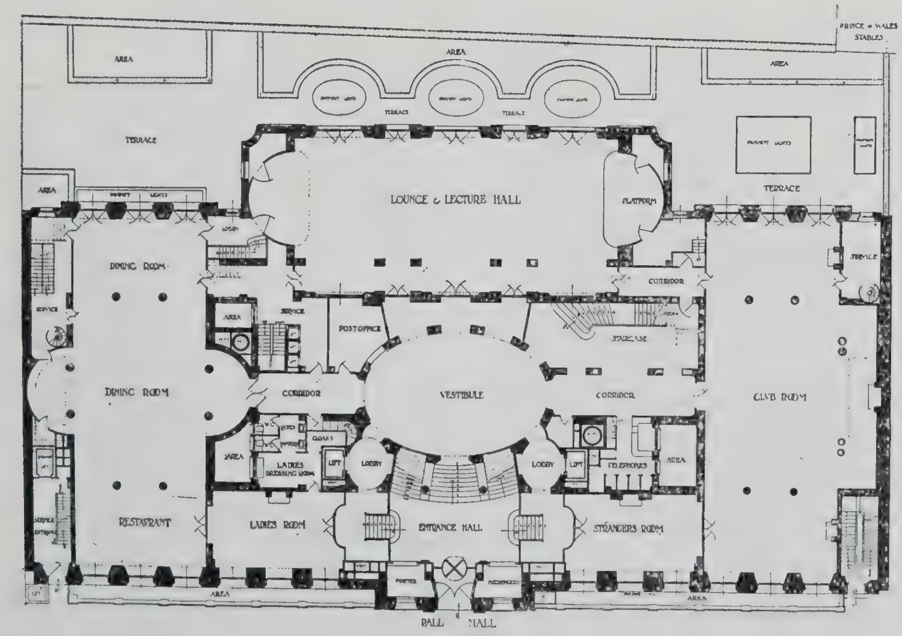
Rex Flintkote Roofing, of which samples have been forwarded to us for examination, has for its base what is the best known non-conductor of temperature, namely, wool felt. The process of manufacture is succinctly described. The felt, having been thoroughly saturated with a "binder" which is proof against acid, alkali, and water, and is unaffected by steam or gases, is subjected to enormous pressure, making a tough, pliable sheet of close texture. The sheet is then coated on both sides with the firm's special compound and with the flint coating which is so valuable a feature of the material, which thus presents a surface as hard as flint on a perfectly elastic non-conducting base. The flint coating is obviously a very valuable feature, preventing the material from sticking together in the rolls, assisting materially in insulation, and forming a minute air-space between the roofing material and the boards, thus preventing dry rot. The material is of very light weight, and is thus applicable to buildings with slender roof supports, or to buildings that have become weakened by age. The samples are of four different thicknesses. The London agents are Messrs. Elliesen and Michaelis, [illegible], Aldermanbury, E.C.



Second Floor Plan.



First Floor Plan.



Ground Floor.

THE ROYAL AUTOMOBILE CLUB, PALL MALL, LONDON. MEWES AND DAVIES, ARCHITECTS.

SOME NOTES ON THE EXHIBITION AND ITS VALUE.

THE OUTCOME OF AN IDEA.

BY H. GREVILLE MONTGOMERY, M.P.

The present Building Trades Exhibition is the outcome of an idea. Some fifteen years ago I exhibited at the then Building Trades Exhibition at the Royal Agricultural Hall, Islington, some specimens of clays and bricks from different parts of the country, I took the opportunity of making a suggestion to the promoter of the Exhibition as to how it should be conducted to ensure success. My suggestion was readily adopted, and this was followed up by an offer to become partner in the exhibition. This I accepted, but my prospective partner failed me, and I was requested to take over the whole responsibility, which I promptly did. Then began the slow and wearisome business of weeding out undesirable would-be exhibitors. I formed a Consultative Council of Architects, with the late Professor Banister Fletcher as chairman, and immediately put the exhibition upon a sound footing. I made a firm rule that no exhibit unless pertaining to the building trades should be admitted, and this produced execrations from shooting gallery proprietors, optical lens dealers, watch makers, sweet-stuff sellers, and such like, who had hitherto reaped a fat harvest from the *élite* of Islington. Men used to come into the office and dangle sovereigns before one's eyes in the hope that the sight of gold might tempt one to relent, but it was of no avail, however.

Photo: Bassano.

MR. H. GREVILLE MONTGOMERY, M.P.

I think I may safely say that there is no trade exhibition held in this or any other country that is so extensive, complete, and exclusive as the present one at Olympia. If these shows have done nothing else they have stimulated the desire for things beautiful in the public mind, for whereas in past years the architect used to build houses without scarcely consulting his client, there is a tendency more and more for the client to suggest to the architect. Further, an exhibition of this kind directly induces an interest in building, and there are few who come to Olympia, and possess even moderate means, who go away without ordering some article for decorating or beautifying the home. But the man whom the exhibitor loves most is the architect himself, who deals in quantities. That exhibitions of this kind are of real value to the professional man has been proved over and over again, for he can see in the course of one or two visits what would take him months to accomplish were he to travel the country in search of new and up-to-date ideas. Again, he can inspect the material as it appears in an actual building, which is a very different thing to being provided with a sample, and what perhaps is of most importance, when an architect comes to an exhibition of this kind, he comes with the determination to talk business, and he comes to the manufacturer instead of the manufacturer waiting for an opportunity (often long delayed) of bearding the architect in his official den.

I could not have accomplished what I have in regard to this exhibition had I not been helped by my brother, Mr. Hugh Montgomery, who, from the beginning has re-

Photo: R. Thiele.

MR. H. C. MONTGOMERY.

lieved me from the more commercial side of the work of organisation. As to when and how these exhibitions will end, nobody knows; they seem to have no finality, and every succeeding one is better than the last, both in the variety of the exhibit and in the lavishness of its construction.

"OF ADVANTAGE TO ARCHITECTS."

BY R. FRANK ATKINSON, F.R.I.B.A.

I consider that an exhibition of this high-class character, when most of the manufacturers do their best to show to the best advantage what they are capable of producing, cannot but be of advantage to architects and all interested in building, as it brings before them in a concise form what it would take weeks or months in travel to ascertain when scattered in various show rooms and buildings, and it is especially advantageous to show the materials in a completely finished building, as is shown in many instances.

"THE VALUE CAN HARDLY BE OVER-ESTIMATED."

BY A. W. S. CROSS, M.A., F.R.I.B.A.

The present exhibition at Olympia promises to be a great success, and this despite the fact that it can, necessarily, only appeal for the support of a comparatively small portion of the community.

But to those whose avocations bring them within the boundaries of the ever-broadening sphere of influence of the building trade, the forthcoming exhibition will be, we believe, one of paramount importance. Thus to the architect engaged in the active practice of his profession—to the building trade specialist and manufacturer—and to that section of the public which may be, for the moment, especially interested in building materials, and new or improved methods of building, this year's exhibition will undoubtedly present features of great interest.

The value to the architect of well organised and arranged *representative* building trades exhibitions which alone will enable him to keep himself thoroughly *au courant* with the various specialities and novelties connected with the practical requirements of his profession, can hardly be overestimated.

A short time spent at an exhibition in the personal examination of a few of the novelties which have probably been already brought under his notice by means of circulars or advertisements in the professional journals, will often enable the experienced practitioner to form a perfectly reliable estimate of their intrinsic worth. Thus building trade exhibitions are undoubtedly of considerable assistance to architects in enabling them to exercise their judgment on the merits of specialities to which their attention has been directed by means of more or less attractively worded advertisements which, in themselves, are not always quite convincing to those rendered somewhat sceptical by past experience. Many of the successful inventions emanating from the building trade fraternity owe much of their commercial success to favourable opinions passed upon them by architect visitors at public exhibitions, and so, naturally enough, manufacturers of building specialities are usually enthusiastic supporters of building trades exhibitions, which enable them to bring the merits of the specialities in which they are interested under the immediate notice of their best customers, viz., the members of the architectural profession. Indeed, such exhibitions often become the medium for an informal exchange of ideas between the architect and manufacturer, which rarely prove entirely profitless on subjects with which their mutual interests are closely concerned.

To the public at large these exhibitions might not be expected to appeal. Yet, as most men at some period of their lives are directly or indirectly interested in building projects, many of the public are to be found on occasions congregated in the vicinity of (from their point of view) the more attractive of the exhibitors' stalls. And if even a small percentage of these casual spectators are thus led to take a greater interest in building methods and building materials nothing but good can result both to the architectural profession, to the manufacturing specialists, and to the community at large.

"OF THE GREATEST POSSIBLE VALUE."

BY ALFRED EAST, R.A.

I think such exhibitions are of the greatest possible value and advantage, not only to the trades intimately associated, but to the general public. They stimulate the interest which the public ought to take in such matters, in questions of sanitation, heating, lighting, and ventilation, which are of so much importance. These exhibitions, I should say, will greatly further the advance which has already been made, and, I think, particularly in the matter I have named, for at Olympia the public can see demonstrated different systems and can form for themselves some idea of the principles they express. The Exhibition must be good, also, for the builders and for the same reason. They see these demonstrations which they might find difficult and too expensive to carry out, as experiments themselves.

"THE MOST USEFUL KIND OF EXHIBITION POSSIBLE."

BY MERVYN E. MACARTNEY, B.A., F.R.I.B.A., F.S.A.

On the poster advertising the exhibition you will find written the words, "The House Beautiful." Is this prophetic? At the very lowest, however, such an exhibition tends to the house useful, sanitary, well-built, and stable. Beauty may be allowed to roam outside a little longer—it will be caught eventually. On one thing we are agreed, that whatever outward pleasantness our buildings possess, they shall be well-built to outlast the years, and within they shall possess conveniences, such as fireplaces that do not require a mine to replenish them, hot water

Photo: Topical.

MR. ERNEST GEORGE DECLARING THE EXHIBITION OPEN.

apparatus that heat, floors that withstand the wear and tear of many feet, waterworks that do not rattle like all Bedlam let loose. Here will be found contrivances to obviate these and many greater inconveniences.

To the architect, first of all, this exhibition is addressed to keep him in touch with the improvements being made in all pertaining to the equipment of the house, to give him knowledge of new materials for walls, floors, roofs, etc. It is indeed to the architect the most useful kind of exhibition possible to conceive, allowing him to garner in an inconceivably short space of time information that could be got in no other way except at the expense of a great deal of time.

To a wider public, however, than architects, this exhibition will make advances. Builders themselves will find much to interest them—improvements in plant, new methods of building, reinforced concrete with its labyrinthic network of iron bars, wires, knots, and so on, patent bricks and stones. "The old order changeth," and he is the wise man who is in the van with his shield quartered and charged with multifarious improvements. Engineers and inventors will not find it a dull show, for their work will make a formidable exhibit, full of ideas and pregnant with suggestions for the future. The great general public will be interested. Labour-saving apparatus and devices of all kinds to please the fastidious in matters of comfort and utility will make a direct appeal. All these voracious and diverse appetites will find an eleemosynary feast, not the kind of meal sparingly distributed at an "ordinary," but the sumptuous profuseness of a city banquet.

"OF GREAT USE TO ARCHITECTS."

BY SIR ASTON WEBB, R.A., F.R.I.B.A.

I have no hesitation in saying that I think it is an exhibition of great use to architects. At the present day, when there are so many novel forms of construction and new methods in fittings of all sorts, it is of great use to see them collected together, and to be able to compare their respective merits without going long distances for the purpose.

THE OPENING CEREMONY AND LUNCHEON.

A distinguished company assembled at the exhibition on Saturday last for the opening ceremony, by Mr. Ernest George, President R.I.B.A., including Sir George Frampton, R.A., Sir William Richmond, R.A., Sir Henry Tanner, I.S.O., Sir A. Brumwell Thomas, Messrs. J. W. Simpson, Walter Cave, John Slater, Ernest Newton, A. W. S. Cross, William Flockhart; W. E. Riley, Mervyn Macartney, R. Frank Atkinson, Alfred Yeates, W. H. Seth-Smith, Arthur Keen, George Hubbard, G. H. Fellowes-Prynne, Sydney Perks, Louis Ambler, Edwin Quinn, F. Dare Clapham, A. H. Ryan-Tenison, Edwin O. Sachs, Ernest J. Brown (President National Federation of Building Trades Employers), A. G. White (Secretary of National Federation), and many others. After a short tour of the main hall, a halt was made at the "Emdeca" stand, from the steps of which Mr. George declared the exhibition open in a short sentence or two:—"I have had the pleasure of walking round this very excellent exhibition, and I have been greatly impressed by observing from the many stands a very useful collection of materials and appliances which cannot fail to be of the utmost use to those engaged in the building profession. I congratulate Mr. Montgomery upon the success of his efforts, and I declare the exhibition open." (Cheers.)

The band of the Legion of Frontiersmen having played the National Anthem, the company adjourned to the Pillar Hall for luncheon, Mr. H. Greville Montgomery presiding.

The chairman proposed the first toast, that of "The King." "Gentlemen," he said, "I ask you to drink to the health of the King, whom we are always glad to honour at any time and in any place." (Hear, hear.) The toast was accorded musical honours.

The Chairman next proposed "The Health of the Prince and Princess of Wales." "I now ask you," he said, "to drink to the health of the Prince and Princess of Wales. Their Royal Highnesses were good enough to pay a visit to this exhibition two years ago, and I am glad to be able to announce to day that they have promised to pay us another visit before this exhibition closes." (Cheers.)

"The Health of Mr. Ernest George, president of the Royal Institute of British Architects," was then proposed, and the Chairman, in doing so, said: "Gentlemen, I am going to ask you to be kind enough to drink to the health of Mr. Ernest George, president of the Royal Institute of British Architects. (Cheers.) He has been so kind as to come here to-day to formally open our exhibition, and we most heartily welcome him among us. To know him is to like him. (Hear, hear.) We are glad to see him looking so bronzed and well after his recent holiday, which has been somewhat curtailed by him in order that he might be here among us to-day. (Cheers.) With a view of getting a little inspiration for the arduous duties which devolve upon him to-day, he has been paying a visit to ancient Venice, and I can assure him, many a time during the past week, when I have been in this hall, early in the morning and late at night, sometimes suffering from cold, sometimes from sweltering heat, and always having to 'boost' up the 'slackers'—standing over them with a stick in order to get their stands ready in time—I have pictured Mr. Ernest George in Venice sitting in St. Mark's Square, feeding the pigeons—(laughter)—and watching the slow rise of the stately Campanile, or perhaps cracking a bottle at Florio's, and talking to his friends about the glories of Venice, or the tragedy of Messina, while we have been putting our few sticks and stones together in this building. Perhaps then, he thought of the beautiful lines of Omar Khayyam:—

> 'Ah, fill the cup; what boots it to repeat
> How Time is slipping underneath our feet,
> Unborn to-morrow, and dead yesterday;
> Why fret about them if to-day be sweet?'

I now ask you to fill the cup and drink to our kind philosopher and friend, Mr. Ernest George." (Cheers.)

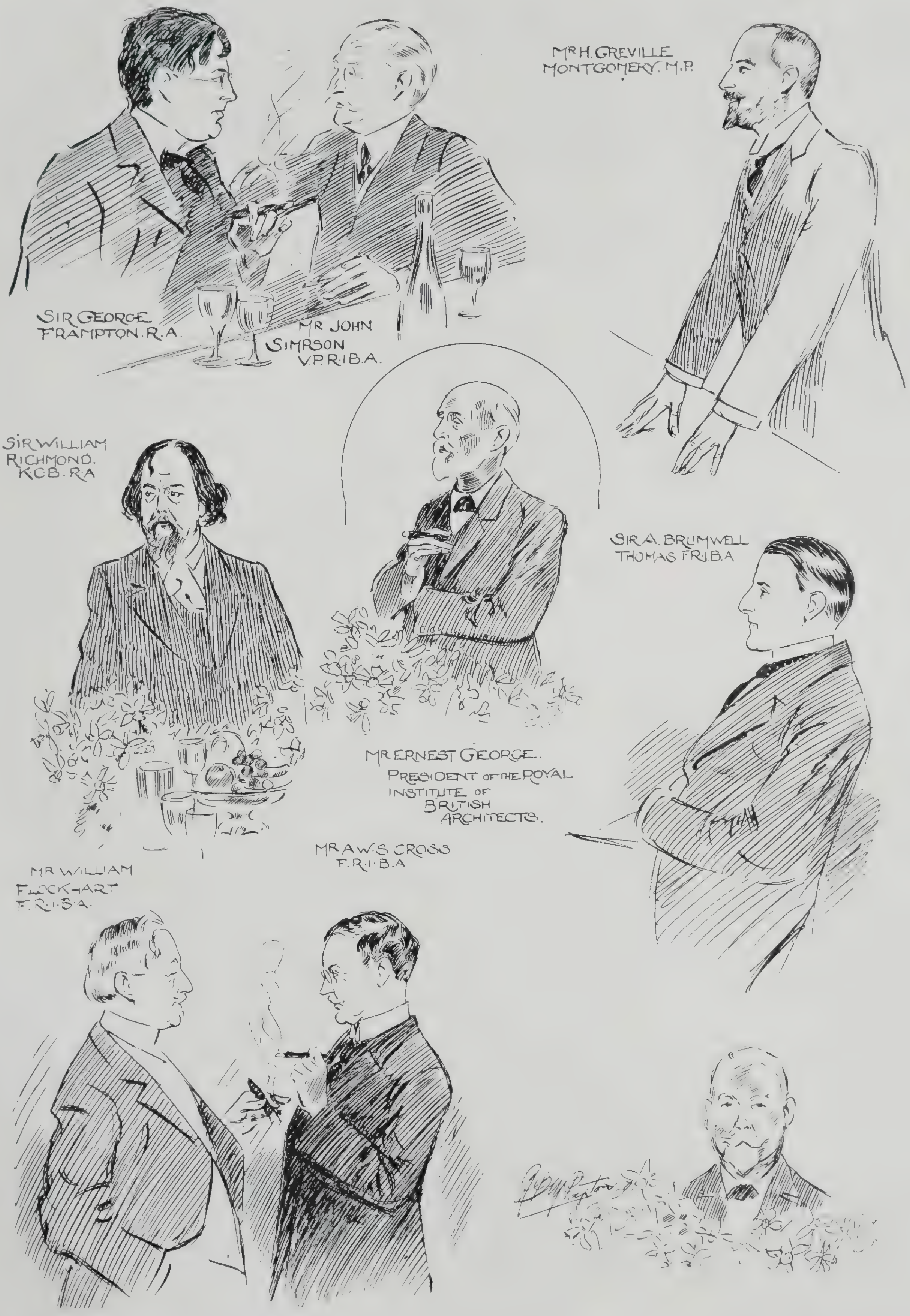
The toast was drunk to the strains of "For he's a jolly good fellow," and with much enthusiasm.

Mr. Ernest George, rising amid applause, said: "I thank you very much for the kind way in which you have drunk to my health, and we thank you most sincerely for gathering here to-day to give the exhibition your valuable support. (Hear, hear.) Such an exhibition as this teaches us a great deal, and it is our business to know what is going on in the building world. (Hear, hear.) We find here to-day excellent samples of every material and appliance to help us in building, and those who pursue that most important art should be fully cognisant of all that is happening in connection with it. (Hear, hear.) The subject, perhaps has never been so amply demonstrated before, and I hope this exhibition will give a stimulus to the building trade in the slack time, when the trowel and hammer are silent in our streets. (Hear, hear.) When labour is becoming increasingly costly it is our business to know all the labour-saving appliances. You (Mr. Chairman) have spoken of Venice. I have been watching the progress of the building of that great tower, the Campanile of St. Mark's. It is now about 200ft. high, and is being built without scaffolding. I think we in this country are sometimes extravagant with our scaffolding. At the four corners of this tower there are rods or stays, and a staging fixed on the top, which goes up as the tower progresses. All the work of building is done from that staging, and it moves up and down automatically, the hoist being within the tower. This has the effect of making the tower appear like a finished piece of work while the building is still going on. At the bottom are tanks in which the hard bricks are soaked for a week before they are taken to the top to be laid. But as to this exhibition, I think, Mr. Chairman, you are to be congratulated at the way in which the exhibitors have responded to your call. (Hear, hear.) It is wonderful the number of buildings and stands which have been put up and the expense incurred to show in the best possible manner all that has been achieved by the various workers. (Hear, hear.) The exhibition is, indeed, a most interesting one, and I wish it all prosperity and success. We thank you, sir, very heartily for all you have done to make it so successful." (Applause.)

Sir Henry Tanner, in calling on Sir William Richmond to propose the "Health of the Chairman and success to the Building Trades Exhibition," said "Mr. Greville Montgomery took on this exhibition fourteen years ago at the Agricultural Hall. There are amongst us to-day, doubtless, some who can remember what those exhibitions were like then, and who can fully appreciate the great improvements which have been carried out by Mr. Montgomery from time to time. (Hear, hear.) We have got an exhibition to-day which seems to have eclipsed all its predecessors both in the arrangement and the finish of the different exhibits. (Applause.) The exhibitors seem to have taken more pains than they were wont to do to make their stands attractive. (Hear, hear.) Mr. Montgomery, by this occasion, has given us an opportunity of seeing once again many friends who in the ordinary course of things we do not often meet, and not least, he has given us a most luxurious luncheon, which perhaps would be to our detriment if we had it every day. (Laughter.) With just these few remarks I will leave it with Sir William to ask you to drink heartily to the toast."

Sir William Richmond said: "The last speaker has given me the responsibility, he tells me, of proposing the toast. Well, as he doesn't choose to himself absorb that interesting duty, I will carry it out in a few words, because we are not here to listen to speeches, but to enjoy an extraordinarily interesting exhibition. (Hear, hear.) I have been taken round a few of the edifices and experiments displayed on the various stands, and I was amazed and confounded by the enterprise which still remains in this old country of ours. (Applause.) I did not see, I am glad to say, more German names than are necessary under existing circumstances—(cries of 'Oh! Oh!' and laughter)—and I am bound to congratulate such a courageous individual as Mr. Montgomery, who for the last ten or fifteen years has been stemming a tide and fighting well for the interests of our own country. (Hear, hear.) Now, in the presence of all these distinguished architects I have no right to give an opinion on the exhibits, but still I do feel that in this country it is essentially necessary that we should continue to press forward and cultivate ideas. We must not stagnate ourselves, nor must we allow ourselves to be stagnated. I know it is the opinion of all here, when I say that we must develope ourselves, profiting by all that we can gain from other countries, absorbing all that is good, and rejecting all that is bad and against the natural instincts of Englishmen and good taste. (Hear, hear.) With these few words, permit me to wish long life, happiness, and prosperity to our excellent president, and congratulate him heartily on the success, not only of this enterprise, but also of previous enterprises. May he give us many more such exhibitions in a like measure as excellent." (Applause.)

Mr. Greville Montgomery, M.P., after the toast had been accorded with musical honours, said in reply: "I thank Sir Henry Tanner and Sir Wm. Richmond for the kind way in which they have proposed the toast of my health, and I thank you, gentlemen, for receiving it so enthusiastically. (Hear,


SIR GEORGE FRAMPTON. R.A.
MR JOHN SIMPSON V.P.R.I.B.A.
MR H. GREVILLE MONTGOMERY. M.P.
SIR WILLIAM RICHMOND. K.C.B. R.A.
MR ERNEST GEORGE. PRESIDENT OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.
SIR A. BRUMWELL THOMAS F.R.I.B.A
MR A.W.S. CROSS F.R.I.B.A
MR WILLIAM FLOCKHART F.R.I.B.A.

SKETCHES BY OUR SPECIAL ARTIST AT THE LUNCHEON FOLLOWING THE OPENING OF THE BUILDING TRADES EXHIBITION.

hear.) Sir William Richmond has said, and he is quite correct, that we do not indulge in long speeches at these exhibitions. Indeed, I am so accustomed to hear dry speeches elsewhere, that I do not desire to inflict speeches upon anyone else unless I am obliged to do so. (Hear, hear, and laughter.) I do not desire to say anything about the exhibition, because I think it speaks eloquently for itself—(applause)—but I do want to pay a tribute to all members of the architectural and building professions who have stood by me in getting a really good exhibition. (Hear, hear.) I am sorry that Sir Aston Webb is unable to be present. (Hear, hear.) He has sent me a letter in which he states that he expected a client at 12 o'clock to-day, and who was coming from the Continent, and regrets that under the circumstances he should be unable to be present at our luncheon. Well, gentlemen, it happens that his client is a lady, so that we can quite understand why he cannot come! (Loud laughter.) I should also like to mention the fact that my friend, Mr. Fitzroy Doll, has been in London on Saturday on only two occasions during the last five years. The previous occasion was that of our last building exhibition at the Olympia, and he is here again to-day. (Applause.) It is only with the help of such enthusiastic gentlemen that I am able to carry on exhibitions such as these, and I thank you all very sincerely for the kind way in which you have received this toast, and given me your support. I only hope it will be my great pleasure to see you all again on a similar occasion two years hence." (Applause.)

The Chairman having invited the company to tea later in the afternoon, an adjournment was made to the exhibition halls.

OFFICIAL VISITS TO THE EXHIBITION.

The first of the official visits of societies, etc., connected with the building trade, took place on Saturday last, the opening day, when the Architectural Association, to the number of about sixty, assembled at three o'clock, to make a tour of inspection, and were afterwards entertained to tea by Mr. H. Greville Montgomery, M.P. Sir A. Brumwell Thomas, F.R.I.B.A., vice-president, proposed a vote of thanks to Mr. Montgomery, congratulating him on the excellent exhibition this year, to which Mr. Montgomery briefly replied. On Monday the Concrete Institute paid its formal visit, and last night (Tuesday), the National Federation of Building Trades' Employers assembled at the Exhibition at 5.30. To-day (Wednesday) the Royal Sanitary Institute will be at the Exhibition, and the remaining fixtures are as follows:—April 23rd, the Society of Architects; April 24th, the Institution of Municipal Engineers, and the Royal Sanitary Institute (second visit); April 26th, the Surveyors' Institution; April 27th, the Institute of Clayworkers; April 28th, the Institute of Sanitary Engineers.

Proposed New Works.

BIRKBY.—The Huddersfield Town Council is considering the erection of new schools to provide accommodation for 1,638 scholars.

BLACKBURN.—The Town Council has decided to proceed with the scheme for a new quarter sessions house and police courts, also a big public hall with lesser assembly rooms. The estimated cost of the building is £113,000, and the site has cost £80,000.

BOURNEMOUTH.—The Town Council has decided to proceed with the erection of a pavilion or Kursaal on the Belle Vue site, at an estimated cost of £70,000. The building is to include a great hall, small hall, dining-rooms, buffet lounge, billiard-room, ladies' room, covered promenade, open air promenades, and an open air bandstand.

DIDSBURY.—Mr. Peter Watson, of Prestwich, has applied to the Manchester Watch Committee for a dramatic licence for the Constitutional Club building here, the idea being to gut the building and reconstruct it as an Empire Theatre. Considerable opposition has been manifested to the scheme.

EXETER.—Mr. Carnegie has promised £15,000 to build a new library, provided the citizens find a free site and pledge the penny rate for the support of the institution.

GARSTON.—A Preliminary Committee of residents is negotiating with the Liverpool City Council with a view to obtaining a sum for the erection of an accident and emergency hospital.

HULL.—Plans for the rebuilding of the Theatre Royal, submitted by the Sefton-Parry Syndicate, Ltd., have been approved by the Town Council.

LONDON, MARYLEBONE.—The Borough Council is considering the erection of new offices, and the President of the R.I.B.A. is to be asked to nominate one to advise on the various available sites.

LONDON, W.C.—"The Daily News" is authority for the fact that a new theatre, to be called the King Edward Theatre, is to be erected on a site between Cambridge Circus and Oxford Street—presumably in Charing Cross Road. The building, it is said, will have extensive frontages to three streets, and is intended to hold from 2,000 to 3,000 people. Mr. William Holles is mentioned as the building owner.

LONDON, WESTMINSTER, S.W.—The organ for the new Roman Catholic Cathedral is to cost £8,000, and will be one of the most powerful instruments in an ecclesiastical building. The scheme is under the direction of Mr. Terry, the organist to the Cathedral.

MATLOCK. — The L.G. Board have granted a loan of £8,500 further to the £20,000 obtained by the Matlock Bath Urban Council under their special Act of 1906 for improvements in promenades, pavilions. The new loan, with a balance of from £3,000 to £4,000 of the former loan, is required to erect a Kursaal, pump-room, and Council offices. Mr. F. W. Ackland Hodge, of 101, Gower Street, London, and Mr. John Nuttall, of Matlock, are joint architects for the scheme.

NOTTINGHAM.—The Nottinghamshire Joint Sanitary Committee are considering the reinstatement of the Shire Hall after the recent fire. It has been decided to carry out some needed alterations and extensions, and the county surveyor has prepared a scheme estimated to cost £4,000.

SHEFFIELD.—A new central library is to be erected here, and the city architect has submitted a design to the Free Libraries Committee, for a building on a site known as the Times Buildings site, which has frontages to Bow Street and Pinfold Street.

SOUTHPORT.—A scheme for a new building in Low Street, to include a theatre, concert hall, ball-room, billiard-room, restaurant, cafe, and roof-garden theatre, is being mooted by the Lyric Theatre Company (Manchester), Ltd. Mr. H. Arnold Turner, of Manchester, has prepared a design for the same.

STOKE-ON-TRENT.—The Town Council has decided to proceed with the proposed extensions to the Town Hall, to cost £20,000. An open competition for designs is to be instituted.

TODMORDEN.—The Town Council is applying to the L.G. Board for a loan of £14,120, for the erection of a new secondary school.

WEST BROMWICH.—The L.G. Board has held an inquiry into the application of the Town Council to borrow £11,000 to erect a refuse destructor in Lake Lane.

Correspondence.

The Editor disclaims all responsibility for statements made by correspondents.
Every letter must bear the name and address of the sender—not necessarily for publication.

The Manchester Education Committee and the Architectural Profession.

SIR,—The Manchester Corporation has, for some years past, maintained a drawing office in connection with the Education Committee, in which all designs for new school buildings, and for alterations to existing buildings, have been and are prepared. Thus architects practising in Manchester are excluded from this work, and in the case of alterations the original architect may see his work copied or reproduced without any acknowledgment by the Committee.

Surely a Corporation is not justified in setting up a department to do the work of an established profession unless it can show clearly that the public will be thereby better served.

The Education Committee has had ample time to prove that its architectural department either does or does not justify its existence. Can the Committee point to any superiority either in planning or in architectural treatment? While, as to cost, if the Committee will state the average cost per scholar of the new buildings, and will make a full return of the cost of maintaining its drawing office, it is submitted that it would at once be clear that its method does not make for economy.

The Manchester Society of Architects recently sent a protest to the Lord Mayor with reference to the new secondary school about to be erected in Chorlton Street in accordance with the method indicated above. . . This new school was planned by the Education Committee as an extension to the existing schools, which were built a few years ago by well-known Manchester architects. These existing schools provide good accommodation for secondary education at an actual cost, including some deep and difficult foundations, of £43 per scholar. In the design for the new schools . . . the estimated cost, as shown by the accepted tenders . . . so far is £53 per head, an increase of about 25 per cent.

Architects have at least the right as ratepayers to demand the same reasonable efficiency and economy in the spending of their money as would be demanded of them in their practice.—Yours truly,

ARTHUR S. BREWIS,
Secretary, Manchester Society of Architects.
Canada Chambers, 36, Spring Gardens,
Manchester.

THE HORSE GUARDS PARADE

Correspondence has passed between Mr. Lewis Harcourt, First Commissioner of Works, and Mr. F. W. Speaight regarding the latter's scheme of alterations in St. James's Park and the Horse Guards Parade. Mr. Harcourt, writing on April 2nd to acknowledge the receipt of Mr. Speaight's letter drawing attention to his proposals, which had previously been submitted to the Press, said: "You will probably have seen the answer which I gave in the House of Commons on March 8th, in which I said that I have no intention of doing anything to destroy the historic associations or the present beauties of one of the most charming of the London parks. As I believe that the alterations suggested by you would have this effect I am unable to promise them any favourable consideration." In reply to an inquiry by Mr. Speaight as to whether the Board of Works was opposed to any alteration being made in the Parade Ground, Mr. Harcourt wrote on the 5th inst.: "My objections apply with equal force to the suggested rearrangement of the Horse Guards' Parade and the incongruous collection around it of a number of miscellaneous London statues of various scales, designs, and dates." Mr. Speaight protested that the principle of his proposal was to effect an improvement in the present shapeless condition of the Parade Ground, and that "to condemn the scheme on account of one or two details must seem to many like condemning the plan of a house on account of the colour of one or two of its wallpapers." Mr. Harcourt's reply, which closed the correspondence, was dated April 7th, and was as follows: "In answer to your letter of the 6th, I think it right to say that my objection to the proposed rearrangement of the Horse Guards Parade applies to the whole scheme, and not only to the collection of the statues. In accordance with your permission, I am sending the correspondence to the Press."

NOTICES OF THE EXHIBITS

By FREDERICK CHATTERTON, A.R.I.B.A.

Explanation and Guide.

1. On the next page is given an alphabetical list of all the exhibitors whose stands are noticed, showing the respective numbers of their stands and the pages on which the notices appear.

2. For those who desire to study the exhibits connected with any particular trade, the notices have been divided into sections, of which a list is given on page 351. At the beginning of each section is a plan of the Exhibition, which, with the index below it, clearly indicates the position of every exhibit included in that section. The positions hatched on the plan are those of firms whose principal exhibits are noticed in another section, but who are showing some speciality connected with the section in which this cross reference occurs.

3. At former Exhibitions we have had numerous enquiries from visitors who know the name of some speciality but not that of the firm exhibiting it. We, therefore, give on page 352 an alphabetical list of articles in the Exhibition having special or proprietary names, with the names of the firms showing them. It must be clearly understood, however, that this list does not include articles already indicated by the title of the firm—as, for example, Vulcanite, shown by Vulcanite, Ltd.; or Ripolin paint, shown by Ripolin, Ltd.—and visitors are therefore recommended to study the General Index on the next page for other articles similar to the two examples mentioned.

GENERAL INDEX.

NOTE.—The Exhibits of the firms under are dealt with in the various sections in this issue. The page numbers given are those on which the notices appear.

Name of Firm	Stand Number and Row.	Notice on page
Acton Patent Concrete Partition Co. (1909), Ltd.	128G	369
Aerograph Co., Ltd., The	36B	353
Anderson, D. and Son, Ltd.	29B	397
Armoured Tubular Flooring Co., The	41C	368
Art Pavements and Decorations, Ltd.	104F	358
Associated Portland Cement Manufacturers (1900),Ltd.	63D	369
Atlas Stone Co., Ltd., The	186K	358
Atmospheric Steam Heating Co., Ltd. (1907)	211, 212N	381
Auto-Controller and Switch Co.	225O	393
Barford and Perkins	235, 236O	353
Barker, John and Co., Ltd.	228O	353
Bath Cabinet Makers' Company, Ltd.	46C	376
Batsford, B. T.	120G	350
Bellman, Ivey and Carter, Ltd.	126G	369
Bell Range and Foundry Co., Ltd.	174 wall space	382
Benham and Sons	107, 108F	382
Birmingham Guild of Handicraft, Ltd., The	203M	390
Boby, William	167 wall space	382
Brilliant Sign Co., The	194M	351
British Doloment Co., Ltd., The	57D	376
British Stone and Marble Co., Ltd., The	43C	358
British Uralite Co. (1908), Ltd., The	215N	369
Brook, F. H.	69D	358
Building Acts Fire Escape Co.	137H	351
Burroughes, W. J. and Sons	221O	382
Cakebread, Robey and Co.	7A	394
Campbell and Christmas	220O	391
Candy and Co., Ltd.	99F and 178 wall space	383
Carron Co., The	129H	383
Carson, Walter, and Sons	130H	398
Carter and Co.	75E	359
Chance Bros. and Co., Ltd.	26B	391
Clark and Co.	21B	370
Cleaver, H. C., Ltd.	86E	376
Coalbrookdale, Ltd.	182 wall space	283
Coignet, Edmond, Ltd.	239P	370
Colthurst, Symons and Co., Ltd.	112	359
Cowley, H. W. and Co., Ltd.	4A	353
Corsite Sales Co., Ltd., The	199, 200M	398
Crittall, Richard and Co.	252Q	283
Cullum, Horace W. and Co.	132H	370
Daneshill Brickworks, The	32B	359
Davis, Bennett and Co.	8A	394
Dawson and Co., Ltd.	39C	359
Daymond, John and Son	139H	370
Diamond Tread Co., Ltd., The	193L	351
Doulton and Co., Ltd.	250, 251Q	394
Durolite Co., The	227O	36
Eagle Range and Gas Stove Co., Ltd., The	179 wall space	384
Ebner, Jos. F.	280 wall space (annexe)	376
Elliott, Samuel and Sons, Ltd., Reading	122G	377
Elliott's Moulding and Joinery Co., Ltd. (Newbury	55C	377
Emdeca Sanitary and Artistic Metal Decoration Co. Ltd.	72D	398
"Excellence" Wood Block Flooring Co., The	65D	377
Exley, William and Sons	216N	360
Expanded Metal Co., Ltd., The	76E	371
Fawcett, Mark and Co.	146 wall space	371
Fenlon and Son (incorporating G. Shrewsbury and Co.)	183K	384
Fireproof Partition and Spandrel Wall Co.	253Q	360
Forest of Dean Stone Firms, Ltd.	267, 268S	360
Gardel, Ltd.	247P	372
Gibbons, James	59D	391
Gilmour Door Co., Ltd.	67D	377
Glover-Lyon Ventilation Co., Ltd., The	208N	384
Goodwin, H. C. and Son	61D	378
Granite Silicon Plaster Co., Ltd., The	25B	371
Graves and Co., Ltd.	191L	361
Gross, Sherwood and Heald, Ltd.	87E	398
Guild of Decorators' Syndicate, Ltd.	233O	391
Gypsum Mines, Ltd., The	277 wall space (annexe)	371
Haig, W. B. and Co., Ltd.	161 wall space	354
Hall, B. J. and Co., Ltd.	16B (gallery)	351
Hartley and Sugden, Ltd.	123G	384
Hazelwood Brick Co., The	1A	361
Höfler, Ltd.	83, 84E	378
Hope, Henry and Sons, Ltd.	97F	392
Houldsworth's Patent Barrow and Motor Wheel Co., Ltd.	269, 270S	354
Hulsen, Julius and Co.	109G	351
India Rubber, Gutta Percha and Telegraph Works Co., Ltd., The	278, 279 wall space (annexe)	361
Ingram, Perkins and Co.	163 wall space	378
Johnson, Richard Clapham and Morris, Ltd.	258R	361
Jones, Fredk. and Co.	78E	372
Jones, John (Chelsea), Ltd.	78E	394
King, J. A., and Co.	71D	372
Kirchner and Co.	195, 196M	354
Kleine Patent Fire-resisting Flooring Syndicate, Ltd.	64D	362
Knowles, John and Co., Ltd.	217N	395

Name of Firm.	Stand Number and Row.	Notice on page
Latham, James, Ltd.	260R	378
Lawrence, Thomas and Sons	223O	362
Leigh, Edward	261S	354
Lewis Construction Co., Ltd., The	56C	372
"Loco" Vapour Gaslight Co., Ltd.	160 wall space	385
London Warming and Ventilating Co., Ltd.	175 wall space	385
Machin and Koenig	9A	373
McNeill, F. and Co.	G. floor 44C gal. 10A, B	362
Maenofferen Slate Co., Ltd., The	224O	362
Major and Co., Ltd.	94F	399
Major, H. J. and Co., Ltd.	110G	363
Manu-Marble Co., Ltd., The	150 wall space	363
Matthews and Yates	162 wall space	385
Maximum Light Window Glass Co.	131H	392
Medway's Safety Lift Co.	30B	385
Mellowes and Co., Ltd.	91F	395
Mitchell, Thomas	34B	363
Modernia Patent Glass Tile Co., The	18B	363
Monninger, C. D., Ltd.	198M	355
Moule's Patent Earth Closet Co., Ltd.	245P	395
Nelson, Watson, Ltd.	106G	364
Newellite Glass Tile Co.	68D	364
Non-Explosive Gas Co., Ltd.	156 wall space	386
Norris, C. H., Ltd.	81E	364
North British Plumbing Co., Ltd., The	15A	395
Nostell Brick and Tile Works	114G	364
Panels, Ltd.	189L	391
Parsons, Thos., and Sons	(See notice p. 397)	400
Pascall, Thos., and Son	116G	365
Patent Indented Steel Bar Co., Ltd.	24B	373
Patent Rapid Scaffolding and Supply Co.	275T	355
Patent Safety Ladder Co.	152 wall space	355
Patent Tip-up Bath Co.	33B	396
Pemberton, Arber and Carey	89F	379
Peters, C. A., Ltd.	19B	399
Phillips and Son	22B	381
Phillips, J. F., and Son	205N	380
Pinchin, Johnson and Co., Ltd.	66D	399
Popham, Mrs. M. L.	274T	365
Potterton, Thomas	31B	386
Praed Patent Safety Gas Light Co., Ltd., The	154 wall space	387
Ransome-ver Mehr Machinery Co.	145 wall space	455
Ripolin, Ltd.	102F	399
Ronuk, Ltd.	43B (gallery)	351
Ruberoid Company, Ltd., The	101F	365
Samuel Brothers	11A	352
Sankey, J. and Sons, Ltd.	115G	365
Saxon Portland Cement Co., Ltd.	187K	373
Seyssel and Metallic Lava Asphalte Co., The	16A G. floor), 1B (gal.)	366
Shanks, Ltd.	10A	396
Shannon, Ltd.	13A	379
Shaw and Carter	222O	392
Sideolith	115G	374
Sissons, Bros. and Co., Ltd.	74D	400
Slingsby, H. C.	142H	356
Smith and Wellstood, Ltd.	171 wall space	387
Smoke Consumption, Ltd.	52C	387
Somerville, D. G., and Co.	141H	373
Standard Range and Foundry Co., Ltd.	137H	387
Stanley Bros., Ltd.	73D	366
Teale Fireplace Co., The	173 wall space	388
Thomas, William, and Co., Ltd.	119G	366
Thornley and Knight, Ltd.	54C	400
Thursfield, C. J., and Co.	173 wall space	383
Titan Lift and Electric Co., The	271T	388
Towers Adamantine Clinker, Fire and Roofing Tile Co.	118G	366
Tozer, James H., and Son, Ltd.	28B	374
Tredegar and Co.	230O	388
Trussed Concrete Steel Co., Ltd., The	80E	374
United Kingdom Fireproofing Co., Ltd.	90F	374
Van Kannel Revolving Door Co., Ltd., The	53C	379
Venesta, Ltd.	60D	379
Vickers, Archibald	27B	400
Vulcanite, Ltd.	42C	366
Waygood, R., and Co., Ltd.	58D	389
Webb Lamp Co., Ltd., The	5A (G. floor) Bay 27 (gal.)	396
Wenham and Waters, Ltd.	96F	392
Werner, Pfleiderer and Perkins, Ltd.	255, 256R	389
White, John P.	77E	380
Wilkinson, Heywood and Clark, Ltd.	62D	400
Willesden Paper and Canvas Works, Ltd., The	45C	367
Wilson Bros.	2A	356
Woodward, James, Ltd.,	242, 243P	396
G. Woolliscroft and Son, Ltd.	219N	367
Wouldham Cement Co., Ltd., The	9A Bay (gal.)	374
Wright, E. G.	185K	389
Wylie, Matthew	158 wall space	356
Yates, Haywood and Co., Ltd.	254Q	389
"Young" firm, The (E. C. Young)	88E	380
Young's Patent Hygienic Bin Co.	202M	356

LIST OF SECTIONS :

SECTION ONE.
Miscellaneous 350

SECTION TWO.
Contractors' Plant and Machinery 352

SECTION THREE.
Bricks—Clay and Glass Tiles—Terra-Cotta—Roofing Materials—Asphalte and Dampcourses—Felt—Reinforced Brickwork—Marble—Stone—Mosaic, &c., &c. ... 357

SECTION FOUR.
Cement—Plaster—Concrete—Reinforced Concrete—Reinforcements—Fire-Resisting Construction 368

SECTION FIVE.
Timber—Woodwork and Joinery—Parquet, Wood-Block and Composition Floorings 375

SECTION SIX.
Heating—Ventilating—Lighting and Lighting Fixtures—Cooking and Laundry Machinery—Grates and Stoves—Lifts—Strong-Rooms—Water Softeners ... 381

SECTION SEVEN.
Art Metal—Ironmongery—Leaded Lights—Stained Glass—Glazing 390

SECTION EIGHT.
Sanitation and Sanitary Fittings—Plumbing 393

SECTION NINE.
Paints—Enamels—Distempers—Stains—Wood Preservatives—Wall Papers—Damp Preventatives 397

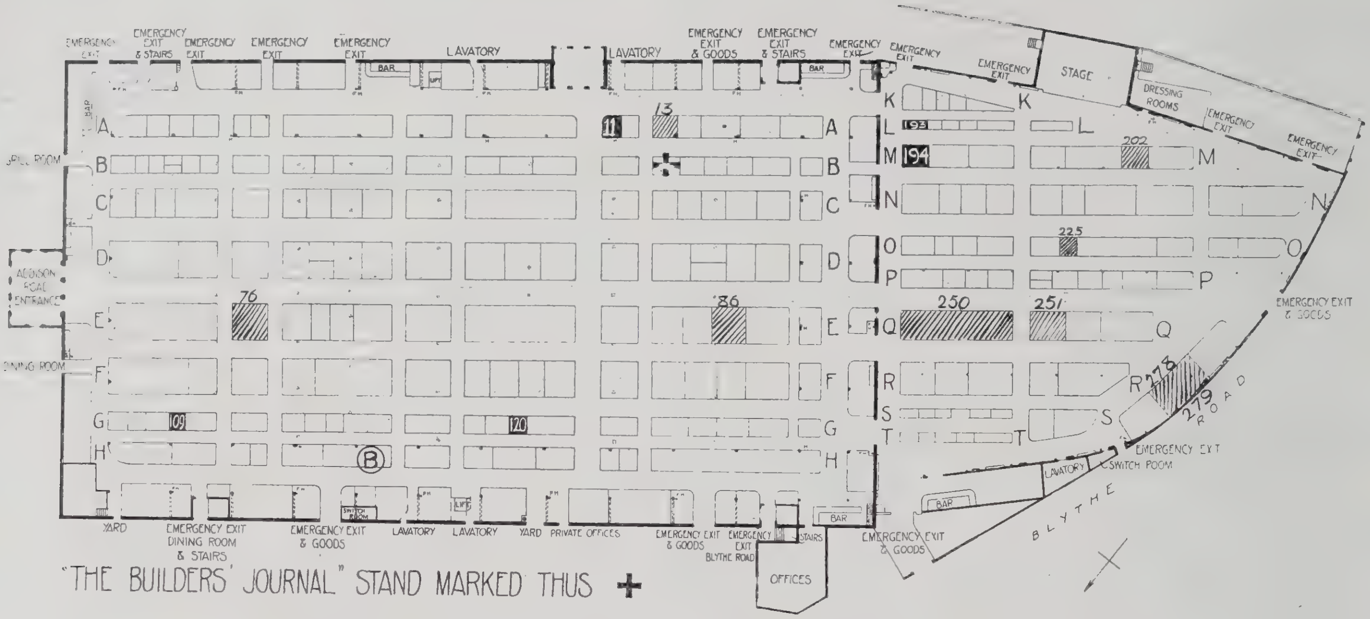
TRADE NAMES.

NOTE.—The following are the trade names of a number of Exhibits with the names of their Exhibitors. It must be understood that the list does not include those specialities indicated in the title of the proprietary firm, as, for instance, Vulcanite—exhibited by Vulcanite, Ltd., or Ruberoid—exhibited by the Ruberoid Co., Ltd. For such exhibits see the General Index opposite.

“Acme” tiles	Colthurst, Symons and Co., Ltd.
“Armadek” composition flooring	Art Pavements and Decorations, Ltd.
“Asbestone” slabs, sheets, etc.	The British Uralite Co. (1908), Ltd.
“A.W.P.” washable water paint	D. Anderson and Son, Ltd.
“Ay-Vee” paint	Archibald Vickers.
“Beck” hot-water system	Atmospheric Steam Heating Co., Ltd. (1907).
“Burkone” grates	Standard Range and Foundry Co., Ltd.
“Cable,” Barker's system of low-pressure hot-water heat	Richard Crittall and Co., J. F. Phillips and Son.
“Carbolineum Avernarius” wood preservative	C. A. Peters, Ltd.
“Carrara” glazed terra-cotta ware	Doulton and Co., Ltd.
“Del” partitions	Gardel, Ltd.
“Devon” fires	Candy and Co., Ltd.
“Deydo” water paint	Pinchin, Johnson and Co., Ltd.
“Dovetail” corrugated sheeting	The Lewis Construction Co., Ltd.
“Ebnerite” jointless composition flooring	J. F. Ebner.
“Eclipse” glazing	Mellowes and Co., Ltd.
“Endelline” enamels	Thomas Parsons and Sons.
“Ephos” sanitary ware	Dawson and Co., Ltd.
“Eternit” asbestos slabs, slates and fireproof doors	Machin and Koenig. and G. R. Speaker and Co.
“Falconite” white enamel	Wilkinson, Heywood and Clark, Ltd.
“Ferrocrete” cement	Associated Portland Cement Manufacturers (1900), Ltd.
“Fluxite” soldering paste	Auto-Controller and Switch Co.
“Grip-back” wall tiles	G. Woolliscroft and Son, Ltd.
“Interlocking” roof tiles	H. J. and C. Major, Ltd.
“Japolite” enamel	Walter Carson and Sons.
“Klinkerite” partion blocks	Dawson and Co., Ltd.
“Kulm” fireproof partition slabs	Horace W. Cullum and Co.
“Lacreite” enamels	Thomas Parsons and Sons.
“Lockwoven” mesh reinforcement	James H. Tozer and Co., Ltd.
“Mack” slabs and partitions	J. A. King and Co.
“Michellite” petrol air gas	North British Plumbing Co., Ltd.
“Minerva” paint	Pinchin, Johnson and Co., Ltd.
“Monolithic” brickwork	Richard Johnson, Clapham and Morris, Ltd.
“Muraline” water paint	Walter Carson and Sons.
“National” automatic temperature control	Atmospheric Steam Heating Co., Ltd. (1907).
“Omne-Tempus” cloth	Samuel Bros.
“Osbornite” fuel	Smoke Consumption, Ltd
“Paragon” tiles	Colthurst, Symons and Co., Ltd.
“Pulsial” hot-water system	Werner, Pfleiderer and Perkins, Ltd
“Queen” combined gas and coal range	Thomas Potterton.
“Rexilite” bitumen dampcourse	Vulcanite, Ltd.
“Sesame” automatic doors	Pemberton, Arber and Carey.
“Sideroleum” wood preservative	D. Anderson and Son, Ltd.
“Silveroid” silver paint	Pinchin, Johnson and Co., Ltd.
“Sirapite” plaster	The Gypsum Mines, Ltd.
“Solignum” wood preservative	Major and Co., Ltd.
“Sotor” preservative for wood in sea water	C. A. Peters, Ltd.
“Star Vacuum” feed water heater, purifier, etc.	Atmospheric Steam Heating Co., Ltd. (1907).
“Steleonite” stamped steel ceilings	Emdeca Sanitary and Artistic Metal Decoration Co., Ltd.
“Stoniflex” roofing felt	D. Anderson and Son, Ltd.
“Syronite” rust preventative	Pinchin, Johnson and Co., Ltd.
“T.L.B.” bricks	Thomas Lawrence and Sons.
“Tudoresk” panelling	H. C. Cleaver, Ltd.
“Universal” roofing sheets	J. Sankey and Sons, Ltd.
“Vitrolite” paint	Walter Carson and Sons.
“Windmill” roofing tiles	Watson Nelson, Ltd.
“Xelite” plaster	Clark and Co.

SECTION ONE.

Miscellaneous.



"THE BUILDERS' JOURNAL" STAND MARKED THUS ✚

Section I.—MISCELLANEOUS.

The following firms are noticed under this section, and their stands are shown blacked in with numbers in white :—

Stand Number	and Row.	
120	G	Batsford, B. T., p. 350.
194	M	Brilliant Sign Co., p. 351.
137	H	B. A. Fire Escape Co., p. 351.
193	L	Diamond Tread Co., Ltd., p. 351.
16	B (Gallery)	Hall, B. J. and Co., Ltd. p. 351.
109	G	Hülsen, Julius and Co., p. 351.
43	B (Gallery)	Ronuk, Ltd., p. 351.
11	A	Samuel Bros., p. 352.

REFERENCES.

The following firms are noticed in other sections, but are showing exhibits connected with this one. Their stands are indicated by hatching :—

325	O	Auto-Controller and Switch Co. (Fluxite Solder), p. 393.
86	E	Cleaver, H. C., Ltd. (Letter-filing Cabinet), p. 376.
250,251	Q	Doulton and Co., Ltd. (Art Pottery), p. 394.
76	E	Expanded Metal Co., Ltd. (The), (Paper Baskets, etc.), p. 371.
278,279	Wall Space Annexe	India Rubber, Gutta Percha and Telegraph Works Co., Ltd., (Tubing, Steam Packing and Rubber Goods), p. 361.
13	A	Shannon, Ltd. (Filing Cabinets), p. 375.
202	M	Young's Patent Hygienic Bin Co. (Storage Bins), p. 356.

B. T. BATSFORD, 94, HIGH HOLBORN, LONDON, W.C. STAND 120. ROW G.

B. T. BATSFORD 94 HIGH HOLBORN
B.T. BATSFORD

It would be safe to say that out of any score or so of representative architectural works on the architect's bookshelf, three quarters have been published by Mr. Batsford, whose reputation in this respect is unique. To those visitors who have not inspected his well-stored shelves at 94, High Holborn—and this applies more particularly perhaps to those from the provinces—this stand will prove a centre of deep interest, for here may be seen a very fine collection of works published from this house.

Amongst recent books, may be mentioned Bankart's "The Art of the Plasterer," Garner and Stratton's "Domestic Architecture of the Tudor Period," etc. Every branch of architecture and the allied arts and sciences is represented, from Gotch's "Architecture of the Renaissance in England," to Rea's "How to Estimate."

Mr. Batsford's renown as a publisher of works on architecture and kindred subjects is world-wide; and his reputation is based not merely on his excellent choice of subject-matters and of the right men to deal with them. His instinct—for it would seem to amount to that—is in this respect so true and sure that he has succeeded in adding quite a remarkable number of standard works to the literature of architecture and archæology. But what is almost equally noteworthy is Mr. Batsford's very clear recognition that, since these works are destined to be handled by persons of refined taste, they should be produced in a manner that shall be in full sympathy with their subject, and perfectly in keeping with the surroundings in which they will ultimately be found. In paper, printing, binding, and illustrations, all Mr. Batsford's publications reach a high level of excellence, as the exhibits on this stand conclusively show.

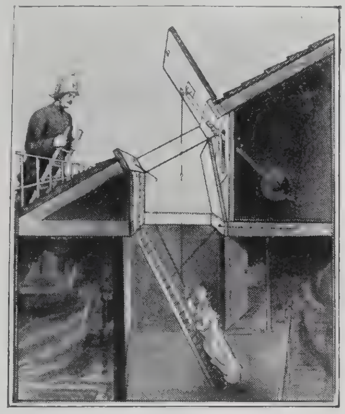
THE BRILLIANT SIGN CO. (1907), LTD., 38, GRAY'S INN ROAD, LONDON, W.C. STANDS 194 AND 194a. ROW M

This company, which has thirteen branches in different parts of the world, has recently erected new works at 131, Uxbridge Road, W., and is exhibiting a large selection of new designs of "Brilliant" letters. These letters are stamped out of stout copper by means of steel dies, and have a burnished gilt finish. In addition to the foregoing the company's "Brilliant" plate-glass fascias, stallplates, swing signs, tablets, etc., are displayed in a representative series, together with a great variety of wood letters and illuminated signs.

The growth of artistic taste among the general public is manifested in no small degree by the greater refinement observable within recent years in the lettering and general "display" of the announcements of a more or less permanent character that are indispensable to business premises. The power of a badly selected sign, fascia, or stallboard inscription to mar completely the appearance of an entire frontage—or, in the instance of a particularly blatant and domineering sign—to vulgarise an entire district—is only too well known to architects, who often have to deplore the ruin by this simple but deadly effective means of their best-laid schemes.

The tendency nowadays, however, is towards neater and more refined, but not less bold and effective forms of fixed advertisement, and the exhibits on this stand demonstrate very clearly that bold effects are compatible with genuine artistic taste. The "Brilliant" lettering is both bold and beautiful.

THE BUILDING ACTS FIRE ESCAPE CO., 4, SOUTHAMPTON ROW, LONDON, W.C. STAND 137. ROW H.



It is to be supposed that, in spite of the enormous increase during recent years of buildings that are constructed on fire-resisting principles, structures of an older and more inflammable type still preponderate enormously; and the most perfectly devised fire-resisting structure is likely to contain the most highly inflammable goods. The building itself may be theoretically and actually safe enough; the risk arises from the contents. Hence it is not likely that the precautions against risk to human life will be in any degree relaxed in consequence of improved methods of building. Means of escape from fire are therefore entirely relevant to the present exhibition, and they are sure to receive careful attention from architects who aim at producing buildings that shall offer the completest possible immunity from risk.

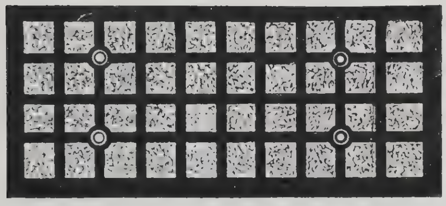
In order to comply with the provisions of Section 12 of the London Building Act, which requires—in certain circumstances—that trap-doors providing access to roofs, should open automatically, this Company has patented the "Bafeco" automatic trap-door fire escape, a full size working model of which is exhibited at this stand.

The mechanism is exceedingly simple, and by a system of adjustable levers, a counterweight, pulleys, etc., the trap-door can be instantly opened or closed. All that has to be done is to pull a handle—as one would a bell-rope. A special point to be noted is that the act of closing securely locks it.

It is adaptable to any size or weight of trap-door, no matter whether in a flat or sloping roof.

Some interesting electrically-driven models—to scale—are also on view.

THE DIAMOND TREAD CO., LTD., 28, VICTORIA STREET, WESTMINSTER, LONDON, S.W. STAND 193. ROW L.



This exhibit comprises a number of specimens of the company's patent treads, and various specialities embodying the non-slipping principle. In regard to the treads, these are of steel, grooved in their length with dove-tailed channels, which are filled in with carborundum. A recently introduced pattern is made of either cast-iron, gun metal or brass, and has the non-slipping material in the form of 1in. squares. This type presents an increased surface of carborundum, and is therefore well adapted for manhole covers, coal plates, etc.

The staircase to be seen at this stand illustrates in a practical way the application of the company's patents

Another novelty on view consists of a patent tile, with a central filling of carborundum, specially valuable for lavatories, bathrooms, etc. Carborundum may be had in 1in. squares, for use in conjunction with ordinary floor tiling.

Diamond Treads have been used in the following buildings:—Underground Electric Railways Co., of London, Ltd., Waring-White Building Co., Ltd., Bell Bros. and Thompson, for Liverpool Overhead Railways; H.M. War Office, Woolwich Centre; H.M. War Office, Aldershot Centre; Crittall Manufacturing Co., Braintree; St. Pancras Iron Work Co., Ltd.; Scott and Middleton, Ltd. (City and South London Railway); Fulham Steel Works, Ltd.; Wm. Whiteley, Ltd., Westbourne Grove; London and South-Western Railway; Manchester City Architect, Town Hall; Spencer, Santo and Co., Ltd., for Borough of Paddington; Mayoh and Haley; Westminster City Council; Alex. Robertson and Co.; Marshall and Snelgrove, Oxford Street; Ismay, Imrie and Co., White Star Line; H.M. Admiralty, Dockyard and Barracks; District Railway Co.; etc., etc.

B. J. HALL AND CO., LTD., 39, VICTORIA STREET, WESTMINSTER. STAND 16. ROW B.

In these days of rush and hurry the photo-copying process for plans has come as a boon and a blessing to architects, surveyors, and others. This firm are showing their "Line-fast" photo copier; and their "Ordoverax" photo reproductions, as well as "everything for the drawing office." Among these are many new things that will be of interest to professional men.

JULIUS HULSEN & CO. COLLINGWOOD BUILDINGS, COLLINGWOOD ST., NEWCASTLE-ON-TYNE. STAND 109. ROW G.

An exhibit such as this, consisting of various chemical preparations and glazes used by brick manufacturers, does not lend itself to illustration, and consequently one does not appear in the space set apart for a block.

This firm show a large selection of their glazes and colours as employed by the manufacturers of glazed bricks and tiles, earthenware, sanitary ware, etc., and a variety of other specialities such as leadless glazes; glazes containing lead (suitable for glazing fireclay and red and white bodies); Majolica, art, matt, lustre, and flowing glazes; underglaze and enamel colours; colouring bodies or stains for dips and glazes, etc.; potters' oxides; glazed specimens; and a preparation containing precipitated carbonate of barytes for the prevention of scum and discolouration on facing bricks, terra cotta, and similar wares.

"RONUK," LTD., PORTSLADE, NEAR BRIGHTON. STAND 43. ROW B (GALLERY).

Of the many improvements effected in recent years in the sanitation of hospitals and other large institutions, none is of greater importance than the introduction of polished wooden flooring. The adoption of this flooring met a want, and also created another. Some material was demanded which would give the floors a smooth, hard, durable, and, if possible, waterproof surface. These requirements are fulfilled by the "Ronuk" Sanitary Polish, as may be seen at this exhibit, which consists of a complete room (open on two sides and panelled with oak), with an oak parquet floor, prepared and polished on the particular method advocated by this company. "Ronuk" is also supplied as a liquid, but in this form is unsuitable for use as a first preparation of new wood.

The importance of constructing a good floor is hardly greater than that of keeping its surface in such a condition as shall do justice to its inherent qualities. With regard to hygienic considerations, and, in fact, with respect to all other aspects of efficiency in a floor, it is, of course, the surface that tells; and Ronuk undoubtedly affords an extremely valuable means of keeping a good floor well up to the mark.

The company make other specialities, such as stains (in five shades), "Ronuk" stopping, and pumice powder. The following are a few of the institutions in which the flooring is maintained by contract:—National Gallery, Hertford House, Tate Gallery, St. Bartholomew's Hospital, King's College Hospital, University College Hospital, Royal Free Hospital, St. George's Hospital, St. Mary's Hospital, New Hospital for Women, Italian Hospital, London Temperance Hospital, Manchester School of Technology, Manchester City Art Gallery, etc.

SAMUEL BROTHERS, LTD., 65 AND 67, LUDGATE HILL, LONDON, E.C. STAND NO. 11, ROW A.

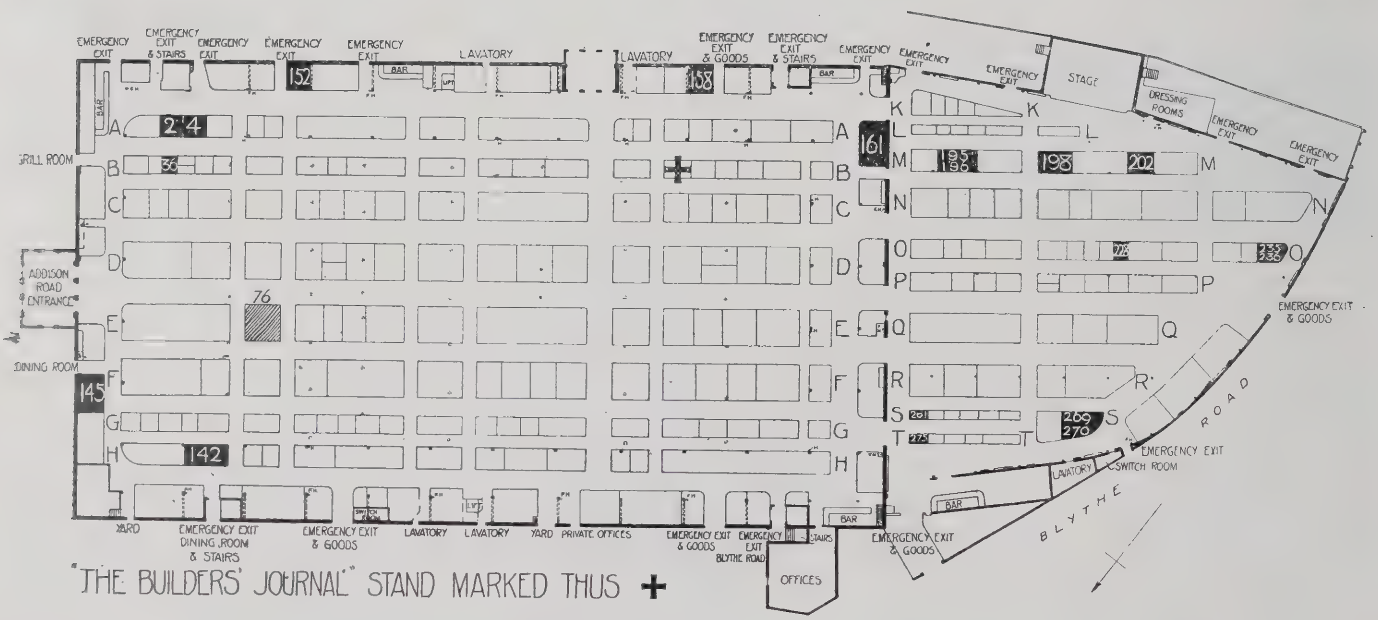
This firm exhibits "Omne Tempus" cloth, guaranteed to withstand the penetrating effects of a prolonged downpour of rain. The cloth has no rubber in its composition, so is in no sense a mackintosh.

A practical demonstration of its waterproof qualities can be seen by those interested in this class of goods. Though having but slight claim to be included among building materials and appliances, architects, and those whose duties expose them to the inclemencies of our climate, may be glad to inspect this exhibit.

An active architect, in fact, spends a great deal of his time in "the open," but more of it in the stuffy atmosphere of the office, and from the latter consideration it behoves him to take the greater care of himself when he is compelled upon occasion to venture forth into the rain. This advice is perhaps superfluous to a class of the community who are particularly alive to the virtues of an effective damp-proof course! A chill taken in consequence of getting one's clothes wet through may turn out to be an exceedingly serious matter, especially if the victim happens to be of delicate and sensitive organisation, as most architects probably are. But even those who are hardy and robust cannot get wet with impunity. Though they may themselves be physically none the worse for the "ducking," their clothes do not share this happy immunity, and in these hard times that is surely an important consideration. The highly æsthetic architect can, perhaps, afford to let his hair grow long and his clothes get shabby; but the average practitioner will be wise to keep himself tolerably well groomed. To keep his clothes from premature ruin, an "Omne Tempus" would prove to be an economical investment.

SECTION TWO.

Contractors' Plant and Machinery.



"THE BUILDERS' JOURNAL" STAND MARKED THUS +

The following firms are noticed under this section, and their stands are shown blacked on the plan with numbers in white :—

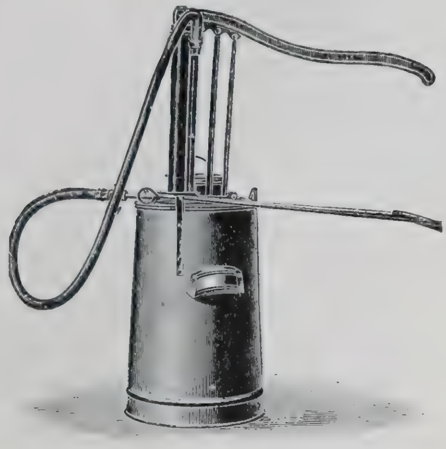
36	B	Aerograph Co., Ltd. (The), p. 353.
235, 236	O	Barford and Perkins, p. 353.
228	O	Barker, John, and Co., Ltd., p. 353.
4	A	Cowley, H. W. and Co., Ltd., p. 353.
161	Wall Space	Haigh, W. B., and Co., Ltd., p. 354.
269, 270	S	Houldsworth's Patent Barrow and Motor Wheel Co., Ltd., p. 354.
195, 196	M	Kirchner and Co., p. 354.
261	S	Leigh, Edward, p. 354.
198	M	Monninger, C. D., Ltd., p. 355.
275	T	Patent Rapid Scaffolding and Supply Co., p. 355.
152	Wall Space	Patent Safety Ladder Co., p. 355.
27		Ransome-ver mehr Machinery Co., p. 355.
142	H	Slingsby, H. C., p. 356.
158	Wall Space	Wylie, Matthew, p. 356.
2	A	Wilson Bros., p. 356.
202	M	Young's Patent Hygienic Bin Co., p. 356.

REFERENCE.

The following firm is noticed in another section, but is also showing exhibits connected with this one. The stand is indicated by hatching :—

76	E	Expanded Metal Co., Ltd., (The), (Builders' Screens and Riddles) page 371.)

THE AEROGRAPH CO., LTD., 42, HOLBORN VIADUCT, LONDON, E.C. STAND 36. ROW B.



In these days of progress one is constantly coming across machines for expediting all kinds of work, and it is not surprising that the principle should have been extended to the mechanical application of paint and whitewash. Instances of the kind are to be seen at this stand, where the very useful inventions of this company are exhibited.

The paint-spraying machine consists of a handpiece (or "Aerograph" proper), an air compressor, paint pot and tubes, and the nozzles can be made large enough to cover at any desired speed, though in practice it is found that the best results are given by one covering from 3 to 5 yards per minute. Involving the same principles, the whitewashing machine is equally efficacious, and should particularly interest contractors.

Daily demonstrations are given at the following hours :—

Decorative painting .... 11 and 3.
Plain ,, ... 12, 4, and 7.

Where large expanses of wall are to be covered quickly, as in the case of warehouses, workshops, engineering establishments, and so forth, the large-sized Aerograph is invaluable; and considering that in many such cases periodical renovation is compulsory, the Aerograph would soon save its initial cost, as it not only dispenses with a large amount of labour, but is so speedy in operation that no interruption to business need be caused where it is employed, and there is obviously no necessity for the erection of any kind of scaffolding, nor for the use of ladders. But the economic and convenient attributes of the machine are perhaps, after all, not its most admirable virtues. It is an invaluable adjunct to the resources of the decorator. Post-cards produced by means of the smallest size of Aerograph have long been familiar, and the artistic effects obtained by this means are often of an exquisite beauty that is not attainable by any other means.

BARFORD AND PERKINS, QUEEN STREET IRONWORKS, PETERBOROUGH. STANDS 235 AND 236. ROW O.

The application of petrol or paraffin motors to road rollers is a sign of the times, and a thing to be looked for. It is now five years since this firm first introduced and exhibited their motor roller, and the intervening period has already produced improvements in its general design. Experience has shown that it was desirable to increase the dimensions of the motor in order to develop the necessary power at a lower speed of revolution.

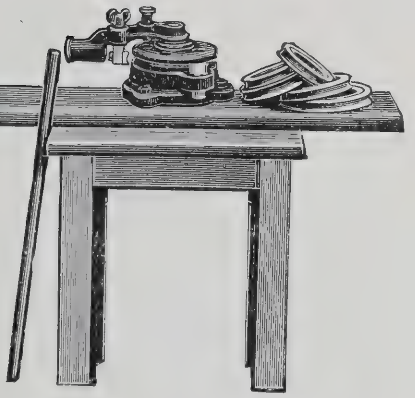
Barford and Perkins are always in the van of the movement; and in this instance, eminently practical as they are, they are also the instruments of a sort of poetic justice. By motors are roads destroyed; by motors shall they be mended.

Where required, this roller can be fitted with a small water tank, and connections for watering both the front and back cylinders, when the roller is used for tar paving.

One of the latest patterns of patent water ballast motor rollers is on view at these stands, where full information concerning its structure, price, etc., may be obtained from those in charge.

Among regular users may be mentioned: H.M. Government, the County Council of Northumberland, the Corporations of Barrow-in-Furness, Birmingham, Hull, Jarrow, etc., Roadite, Ltd. (Ferromac), Bath; the Road Paving and Cement Co., Ltd., the M.C.C. for Lord's Cricket Ground, the Jockey Club, Newmarket, the Newbury Racecourse Co., the Russian Imperial Government, three racecourses in Japan, and numerous private owners, etc., etc.

JOHN BARKER AND CO., LTD., KENSINGTON, LONDON, W. STAND 228. ROW O.



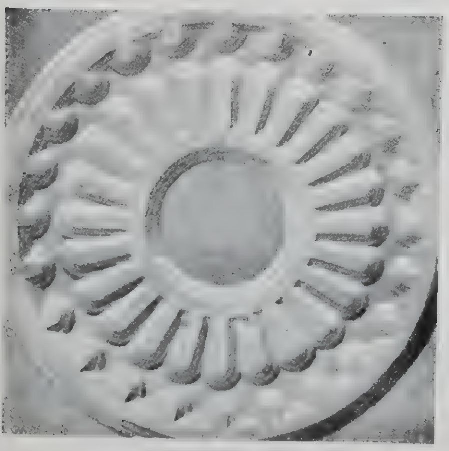
Messrs. Barker and Co. are exhibiting at this stand the "Kennedy" patent bending machine, which is constructed to bend welded, butt-jointed, and seamless tubing; also round, flat, angle, tee and channel bars, in copper, brass, iron, or other metals.

Such a machine as this has only a general interest for architects, but engineers and contractors will find its utility for bending cold, solid bars for concrete reinforcement a matter worthy of their close attention.

Practical demonstrations of bar bending, in which various sections will be dealt with, will be given.

The machines are made in several sizes, and of various capacities, and the following is a list of public bodies, railways, firms, etc., now using them :—The Admiralty, H.M. Office of Works, Military School of Engineering, Chatham; Royal Ordnance Factories, Woolwich; Royal Arsenal, Woolwich; Houses of Parliament, Works Department; India State Railway, Bombay; India State Railway, Calcutta; India State Railway, Madras; British Columbian Pacific Railway Co.; H.M. Post Office; F. A. Glover and Co., electrical engineers; Takata and Co., Japan; H. and W. I. Nelson, Ltd., Ship Owners, Liverpool; White Star Line; Gt. N. Railway; L. and N.W. Railway Co.; L. and S.W. Railway Co.; Gt. Eastern Railway Co.; Gt. Western Railway Co.; Midland Railway Co.; Gt. Central Railway Co.; the Gas, Light and Coke Co.; Tottenham and Edmonton Gas Light and Coke Co.; Hartlepool Gas and Water Co.; Aberdeen Corporation Works; Newcastle and Gateshead Gas Co.; County Borough of Stockport Gas Works; Nottingham Corporation Gas Works; Waltham Abbey and Cheshunt Gas Co.; Eastbourne Gas Co.; Winchester Water and Gas Co.; County Borough of Salford Gas Works; Glasgow Corporation Gas Works, etc., etc.

H. W. COWLEY AND CO., LTD., BELLA STREET IRONWORKS, DAUBHILL, BOLTON. STAND 3 AND 4. ROW A.

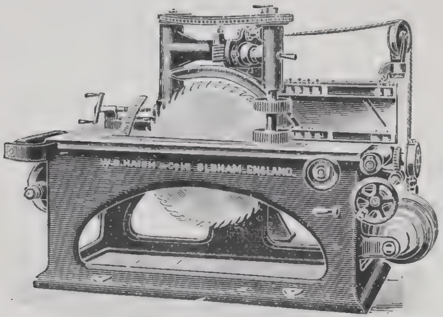


The sample here illustrated of work done on one of Messrs. H. W. Cowley and Co.'s trenching and moulding machines shows very strikingly the facility with which the compound table adapts itself to the production of decorative panels; the table revolving while the cutters operate. The No. 1 machine is for circular moulding. Mathematical correctness of radius is ensured, and as the moulds are worked by the same cutters as the straight work, the machine is particularly useful in the production of angle brackets in doors, windows, etc., where the circular moulds have to join up to the straight portions. Shurmer's patent rapid trenching and moulding machine, No. 2 (for straight moulding), is competent to perform all kinds of trenching, circular moulding, slot mortising, etc., as the table can be turned round on its central pivot, locked in position, raised or lowered, pushed backward or forward, adjusted at any angle to the spindle, as in the trenching of stair strings; and holes and slots of almost any diameter or shape can be cut, as in producing moulded panels; while the machine is equally serviceable for straight moulding.

Cowley's patent improved hollow chisel mortising machines are shown in several varieties—horizontal and vertical, with foot lever and hand lever, or to work automatically. In the chain mortiser combined with hollow chisel, the chain and the square chisel can be used either separately or both together on the same piece of timber.

In a long list of the firms using Messrs. Cowley's Woodworking Machines, the following names are included: Messrs. Bullen Bros. and Sons, Ltd., Liverpool; Hardy Robson and Co., Newcastle; R. Neill and Sons, Manchester; J. and A. Ogilvie, Aberdeen; Trollope and Sons, London, etc., etc.

W. B. HAIGH AND CO., LTD., OLDHAM AND LONDON. STAND 161. WALL SPACE.



This firm of saw-mill and joinery machinery makers show a large number of their machines, several of which are electrically-driven for demonstration purposes.

Amongst those of special interest are the blind pulley stile mortising machine, the C.X.X. friction feed four-cutter planing and moulding machine, high-speed bandsaw, with roller bearings, effecting a large saving in power consumption, three other types of planing and moulding machines, three wood-trimmers, two circular saw benches, and a number of accessories.

Among the machines shown in operation is the pulley stile mortise machine, in which the sizes for double or countersunk mortices can be easily adjusted.

A very handy planing and moulding machine of moderate cost is also running, and one of the chain mortice machines carries a new type of chain cutter, which has a remarkable wearing capacity.

A number of certificates and awards that have been gained by the firm are on view at the stand.

Among the important contracts lately undertaken by Messrs. Haigh is one gained in competition with the principal makers of woodworking machinery for the East Indian State railways. This involves very stringent tests by the Government inspectors. The firm's chief offices and works are situated at Oldham, and their London offices are at 7, Wilson Street, E.C.

Among the many establishments to which Messrs. Haigh's machinery has been supplied are the following:—William Whiteley and Co.; D. Sharp, timber merchant, Wokingham; L.C.C. School of Building, Brixton; H.M. Ordnance College, Woolwich; H.M. Military School of Engineering, Chatham; H. and G. Bisley, saw mills, Bermondsey; Davies Bros., joinery works, Walthamstow; Trollope and Sons and Colls and Sons, London.

HOULDSWORTH'S PATENT BARROW AND MOTOR WHEEL CO., LTD., PARK LANE, KEIGHLEY.
STANDS 269 AND 270. ROW S.

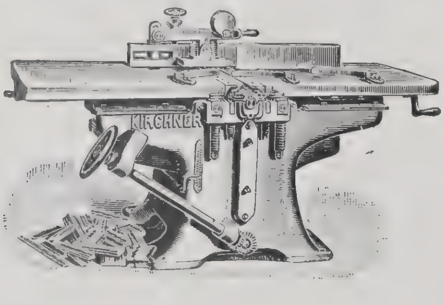
If the delicate wheels and other more intricate works of a watch can be produced by machinery, what is to prevent the accurate construction and adjustment by similar means of the wheels of a barrow, or truck, or wagon, or other form of motor? This achievement has come to pass, and the ancient wheelwright, that antique man of might and mystery, has been effectually supplanted. Venerable relics of his once numerous tribe may still linger on in remote villages; but in the towns, where wheels run fast, they must be made fast, and at this stand one may observe, with mingled awe and astonishment, the most scientific and up-to-date methods of making them. A hint of the marvels and mysteries of the revised craft is conveyed by the accompanying illustration.

A very large selection of patented goods manufactured by this firm, having particular reference to trucks and barrows, is on show at this stand, and attention is called to the new patent packer for circular saws, new patent saw setters, new patent axle for barrow wheels, new patent tip for barrow-wheel axles, etc., etc.

The saw setter consists of a long bar fitted with a sliding cone, which depends for position upon the diameter of the saw. When adjusted, the teeth rest on a steel anvil, and each alternate one is pressed down by means of a hammer-lever till all are set.

Contractors will find much to interest them here, and even the architect who follows his habit, natural or professionally acquired, of getting as close as possible to the heart of things, will not disdain to devote at least a small portion of his time to an inspection of the very ingenious appliances here on view.

KIRCHNER AND CO., 21, 23, 25, TABERNACLE STREET, LONDON, E.C. STANDS 195 AND 196. ROW M.

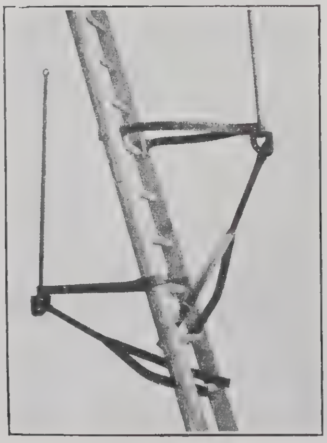


Machinery in motion at an exhibition is always secure of a constant crowd of interested onlookers, and Messrs. Kirchner's stand has been upon every occasion one of the most popular in the Exhibition. They have always something of special interest to show, and they take infinite pains to demonstrate the capabilities of their machines. The great point is that their demonstrations are never merely perfunctory. They take obvious pride and delight in them; and such enthusiasm is decidedly contagious, more especially since the necessary explanations are always given with becoming modesty. They never make the mistake of over-much insistence on the merits of their goods.

This company's exhibit is entirely devoted to a display of their improved and patented sawing and woodworking machinery, as manufacturers of which they are well known among saw millers and contractors whose business is extensive enough to necessitate the laying down of high-class plant. The interest of architects, therefore, in an exhibit of this description is not that of the specialist, but a general acquaintance with the various types of machines by which planing, mortising, thicknessing, mitring, etc., are performed is nevertheless desirable.

Messrs. Kirchner and Co. show eight such machines which embody in their design and construction all the latest improvements. For instance, their B.W.A. combined planing, thicknessing, and moulding machine calls for special attention. In this, the pressure arrangements are so adjusted that the smallest and thinnest work can be done as well as the maximum sizes, and it is, moreover, adapted for all classes of straight mouldings in hard or soft woods.

EDWARD LEIGH, 85, TAMWORTH ROAD, CROYDON. STAND 261. ROW S.



This invention is primarily intended for small constructive or repairing works, and obviates the necessity for scaffolding, which, in such cases, becomes a relatively heavy expense. Consisting of two hinged wrought-iron forks, and a vertical rod or hand-rail standard, the former are so fitted to the ladder as to form with it a triangular support, upon the horizontal top of which the end of a two-board stage rests.

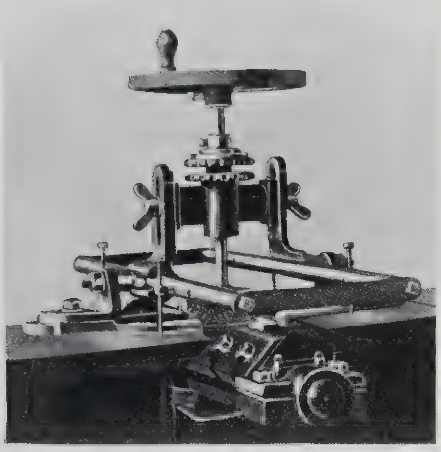
These brackets have been very thoughtfully designed, and can be used with equal usefulness in three positions:—

(a) When the ladders are vertical.
(b) In front of inclined ladders.
(c) At back of inclined ladders.

In addition to these advantages, these brackets are easily put in position, will fit any sized ladders, and can be folded up into a small compass.

The following are some of the firms to whom these ladder brackets have been supplied:—London and North-Western Railway, Great Western Railway, London and South-Western Railway; Smith and Sons, South Norwood; Higgs and Hill, Lambeth, London; Mitchell Bros., Guildford; F. Wills, Bristol; Tate and Sons, Silvertown, London; Wiltshire and Son, Sevenoaks; Royal Arsenal Co-operative Society, Abbey Wood; Wallis and Co., Eastbourne; E. Van Raalte, Poole, Dorset; Grand Junction Co., Rickmansworth; T. and S. W. Jenkins, Newport, Isle of Wight; Vaughan and Marriott, St. George's Road, London; Queen's Club Gardens Estate, W. Kensington; Huntley and Palmer's, Reading; H. Stevens and Co., Southampton; Wm. Grant and Sons, Burslem; Dennis, Sill and Son, Doncaster; Ashton Brothers and Co., Hyde; Warrington Corporation (gas department); etc., etc.

C. D. MONNINGER, LTD., 124, CLERKENWELL ROAD, LONDON, E.C. STAND 198. ROW M.



Inventiveness is nowhere more strikingly manifested than in the domain of woodworking machinery, on which ingenuity has been lavished to such an extent, both quantitatively and qualitatively, that it might almost be imagined that the limit had been reached. Every fresh exhibition, however, brings to notice further developments, until it would really appear that the field is absolutely inexhaustible. Manual labour in woodworking, even in its most delicate operations, seems to have been completely superseded, and in most cases surpassed.

A large variety of saws and woodworkers' appliances are displayed at this stand, together with numerous other specialities made by this firm.

Particular attention is called to Smith's patent hand sharpening machine for surface planing machine cutters, which is designed to supersede the old method of whetting the cutters by hand rubbing stones. It also enables the cutters of surface planing machines to be whetted without removing them from the cutter block. By the use of this machine the cutters are kept perfectly true.

Another interesting novelty shown by this firm is the patent renewable file, which has many advantages over the ordinary tool. It consists of a file holder (either solid or hollow), and thin loose file blades, to which they can be readily fixed. Re-cutting is unnecessary, as the blades are cut on both sides, and being of better temper than solid files, last longer.

Among this firm's customers are the principal English, Irish, and Scotch railways, the various Government Dockyards, Woolwich Arsenal, and the principal shipbuilding firms and saw millers.

THE PATENT SAFETY LADDER COMPANY, PRIESTGATE, PETERBOROUGH. STAND 152 WALL SPACE.

Contractors, decorators, and plumbers will find this exhibit an interesting one. This company is showing a large section of patent safety extension ladders from 6ft. 9in. to 15ft. 6in. when closed, and when fully extended, measuring from 11ft. 3in. to 29ft. in height. This latter dimension does not, however, represent the maximum height of ladders of this class, as the firm makes them up to as high as 46ft. 3in. In the larger sizes a steel cable, considerably increasing their rigidity, is inserted in the back. The extension section is raised by means of a rope and pulley attachment, and an absence of complicated catches or springs adds to the simplicity of working.

There are several other ingenious ladders on view, including the Patent Safety Extension Trestle Ladder, which has a movable collapsible platform near the top, large enough for a man to stand on.

The following is a list of some of the British public bodies to whom patent safety extension ladders have been supplied:—The Birkenhead Corporation, Walthamstow Education Committee, Manchester Corporation, Weymouth and Melcombe Regis Corporation, Glasgow Corporation, Liverpool Corporation, West Bromwich Corporation, Neath Corporation, Ilkeston Education Committee, Corporation of Westminster, South Staffordshire Waterworks, Normanton County Council, Stratford-on-Avon Corporation, Peterborough Corporation, Monmouthshire Education Committee, Nottingham Corporation, Leicester Corporation, Salford Corporation, Birmingham Corporation, Burton-on-Trent Corporation, Warrington Corporation, Plymouth Corporation, Cardiff Corporation, various gas companies in Great Britain and Ireland, and many fire brigades, etc., etc.

PATENT RAPID SCAFFOLD TIE CO., LTD., 124, VICTORIA STREET, WESTMINSTER. STAND 275. ROW T.

It is more astonishing that the old primitive methods of the scaffolder should have endured so long, than that they are now being rapidly superseded. Patent scaffolding appliances are more familiar in America and on the Continent than they are as yet in this country, where, however, confidence in their efficiency is swiftly increasing.

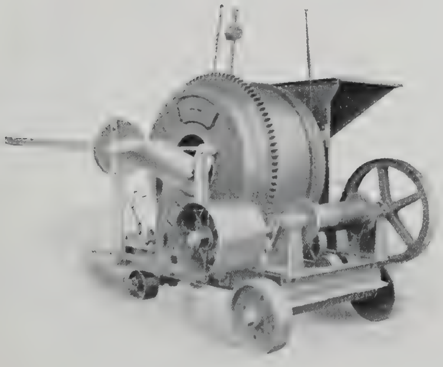
The firm under notice are manufacturers of appliances for safe and rapid scaffold erection, and are contractors for the supply, hire, or erection of all kinds of scaffolding. They are also sole proprietors of the D. Palmer Jones patent scaffolding appliances.

The company exhibit a photo of the firm's scaffold tie in use at the London Coal Exchange, the building contractors being Messrs. Holliday and Greenwood, Ltd., of Brixton, S.W.

The firm's exhibit shows the patent rapid scaffold tie in use and under test. It is therefore sure to receive the attention that is always excited by anything in the nature of movement and actuality. Exhibitors of goods that can be watched as "going concerns" enjoy, undoubtedly, a considerable advantage over those whose exhibits are necessarily of the "still life" order; for while those persons are comparatively few who are, of their own volition, able to reap "the harvest of a quiet eye," everybody is attracted and stimulated to enquiry, reflective or oral, by the observation of any kind of machinery in motion. It provokes exactly the kind of questions and answers that promote business.

The appliance under notice is long past the experimental stage, and some of the places at which it has been employed and appreciated may be here mentioned, namely:—Devonport Dockyard, Chatham Dockyard, Woolwich Arsenal, the London Coal Exchange, residences in Upper Brook Street, S.W.; the Challis Hotel, and the Convent of the Sacred Heart, Wandsworth.

RANSOME-VERMEHR MACHINERY CO., CAXTON HOUSE, WESTMINSTER, LONDON, S.W. STAND 145 WALL SPACE AND 26A, BAY.

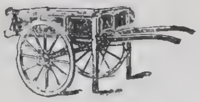


This exhibit has a special interest for engineering and general contractors, and illustrates the Ransome concrete mixer manufactured by this company. The mechanism is exceedingly simple—consisting of a revolving drum, within which is a series of scoops. These, when in motion, stir the materials with an action somewhat resembling that produced in hand-mixing, with the difference that the incorporation is far more complete and uniform. In addition to ploughing through the material over and over again, the scoops drop the concrete into a shute (whose position is controlled by a lever), from which it is discharged without necessitating the tilting of the machine.

These mixers are made in six sizes, with a drum capacity ranging from 2 to 40 cubic feet, and a working capacity (per day of 10 hours) of from 20 to 400 cubic yards.

The following is a list of some of the principal users in England: S. Pearson and Son, Ltd., Hull Joint Dock; Fisher and Le Fanu, Derwent Valley Waterworks; Sir John Jackson, Ltd., Loch Leven Water Power Works, Kinlochleven; L. P. Nott, Middle Dock Contract, South Shields; Walter Scott and Middleton, Ltd., railway works in Wales; D. G. Somerville and Co., Kodak Building, Harrow; Edmund Nuttall and Co., Liver Building, Liverpool; Holloway Bros. (London), Ltd., Caxton House, and Royal Orthopædic Hospital; Waring and White (1906), Ltd.; Selfridge Store, Oxford Street; Thos. Docwra and Son, new gasholder tank, Enfield; The Earl of Dudley, Baggeridge Colliery, Dudley; Castner-Kellner Alkali Co., building of a ferro-concrete culvert for the Weston Chemical Co., of Weston Point, Runcorn, Cheshire; C. H. Normanton and Son, Manchester; A. Jackaman and Son, Cooperative Flour Mills, Silvertown.

H. C. SLINGSBY, 142-146, OLD STREET, LONDON, E.C. STANDS 142 AND 143. ROW H.



This exhibit includes a variety of patent trucks, sack trucks, hand carts, tipping waggons, wheelbarrows, milk trucks, wheels, ladders, etc., for which this firm has taken out many patents, and been awarded, from time to time, seventeen gold medals.

The attention of those interested in traction may be called to a recently introduced tyre made of white felt, for which many advantages are claimed.

Contractors will specially note the very representative series of patent "steel-back" extension and step ladders. The former have this advantage over ordinary extension ladders, in that the front and back sections are identical in shape and size. The extension goes up at the back, and not in the front, as is usually the case, and the risk of the user missing his foothold is thereby lessened. The safety of the user would be in any case a consideration of the utmost importance morally; but in view of the serious financial liabilities of contractors under the Workmen's Compensation Act, and, it is to be feared, the spice of recklessness that has been infused into workmen by the knowledge that if anything happens to them, they or their representatives are secure of some sort of recompense, such precautions as that which has just been described assume additional value and importance. Extension ladders are, in certain circumstances, of immense advantage as compared with the ordinary kind, and, as constructed by this firm, they are even safer.

The firm's trucks, etc., are used by the War Office Department, the G.P.O., the Railway Companies, and most of the large firms, etc., etc.

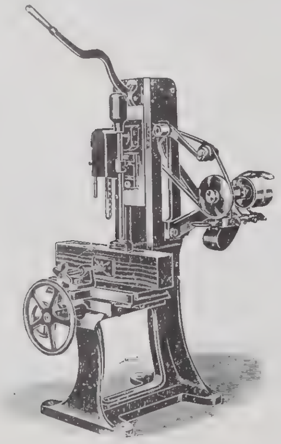
MATTHEW WYLIE, BALFOUR HOUSE, FINSBURY PAVEMENT, E.C. STAND 158. WALL SPACE.

Buildings constructed of concrete blocks would be much more common in this country if the means of producing the blocks were better known. Consequently the "Ideal concrete machines" that are being exhibited by Mr. Matthew Wylie are sure of receiving a fair share of attention from visitors.

The machines are small and portable, and, with their accessories and attachments, are capable of producing not only plain building blocks, but also ornamental designs in columns, capitals, mouldings, etc., and the blocks may be made either hollow or solid. Moreover, the "down-face" principle upon which the machine is constructed renders possible the formation of a face richer in material than the balance of the block, thus making it closer grained, more impervious to moisture, and capable of architectural treatment. The face may be made either severely plain or (to recall a felicitous expression applied by facetious young architects to a certain type of client in Mr. Swales's lecture on American architecture, "rich and rock-faced." The surface may be "panel, corrugated, cobble, rock with tool margin, bush-hammered with tool margin, bush-hammered, or broken ashler," thus avoiding "that awful monotony" that has been sometimes attributed to concrete blocks. The blocks may be of any reasonable size or shape; and a special machine produces sills, lintels, cornices, steps, keystones, pavement, slabs, etc., either solid or reinforced.

This machine is shown at an opportune moment. The utility of concrete having been fully established, the difficulty was to make it presentable. Of this problem the "Ideal" concrete machine offers a solution that has been generally accepted in the United States of America, and may, perhaps, become equally popular on this side of the Atlantic. A concrete block structure is here shown.

WILSON BROS., VICTORIA MACHINE WORKS, LEEDS. STAND 2. ROW A.



The "speeding-up" of the building industry has only become possible through the introduction of machinery in every department. This revolution has been nowhere more complete than in the joinery department, where the old leisurely methods of handwork have been almost completely superseded. Hardly a contractor, no matter how small his business, can afford to dispense with an installation of woodworking machinery; and this is one of the reasons why the duration of a contract is now counted in months rather than in years; and why, incidentally, the serenely philosophical atmosphere of the carpenters' shop, so graphically described in "Adam Bede," seems to the modern reader to be positively archaic.

Messrs. Wilson Bros. exhibit several of their well-known wood-working machines, of which the following is a list:—

One new patent "Rex" chain mortising machine, to take in wood 12ins. deep by 9ins. wide, to mortise ¼in. to 1in. wide, from 4½ins. to 6ins. deep, with ½in. chain, guide bar and sprocket, and chain cutter sharpening machine, mounted on an extended arm.

One new patent "Rex" chain and hollow chisel mortising machine, fitted with independently working hollow chisel arrangement and chain cutter sharpening machine attached.

One new design improved band sawing machine "A" pattern with ball bearings. This machine has 30in. diameter wheels, the top one being of light pattern, carried in a U arm having ball bearings on either side. The remaining exhibits are patent centre motion mortising machines to take in wood 11ins. by from 5½ins. to 7½ins. respectively.

YOUNG'S PATENT HYGIENIC BIN CO., 4 AND 8, ARTHUR STREET WEST, LONDON, E.C. STAND 202. ROW M.

The imperative need for cleanliness in every administrative department of our hospitals and sanatoria, has resulted in an increased determination on the part of manufacturers to supply such articles as cisterns, tanks, etc., so constructed as to reduce to a minimum the possibility of fouling by the elimination of rivets and internal seams. This firm's exhibit includes samples of cisterns and tanks (made under Leeche's patent) in which these are distinguishing features, the object being to provide as few places as possible for the lodgment of dirt.

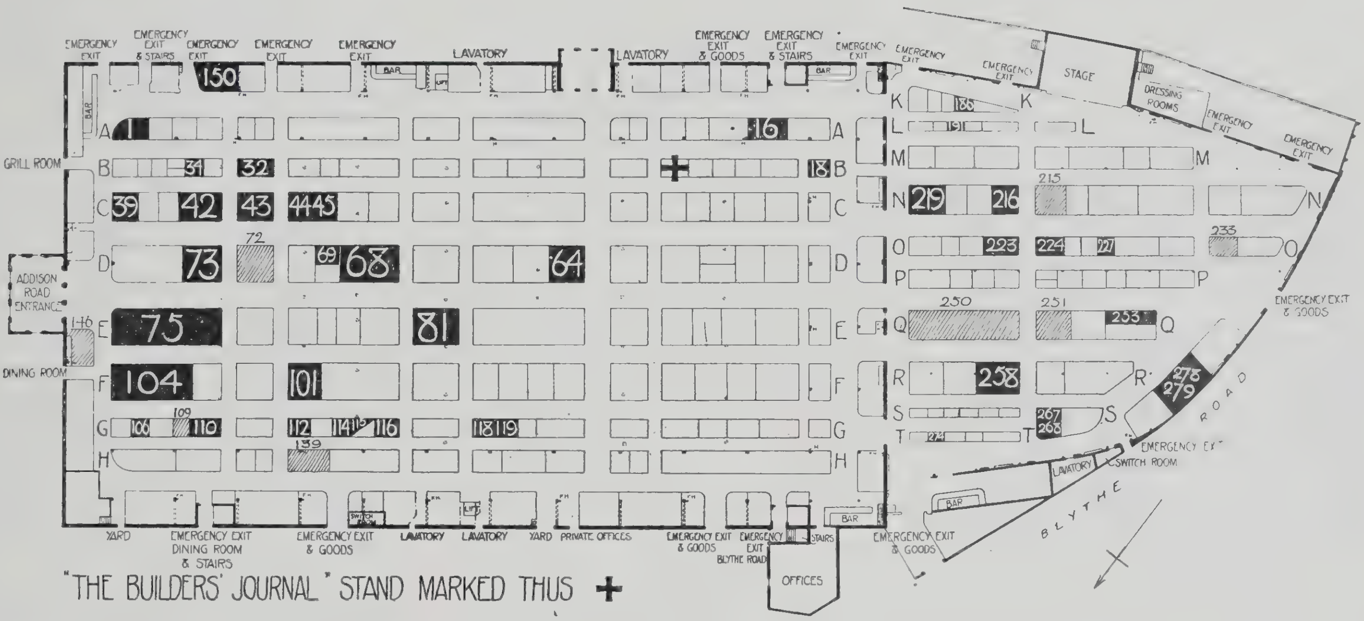
With similar intention, this firm also shows "Young's" patent sanitary and storage bins, which are made entirely without internal corners or crevices, the principle being that no part shall be inaccessible.

Among various interesting specialities comprising the remainder of this exhibit, there are some samples of automatic dry powder weighing machines (Southall and Smith's patent), which weigh and deliver automatically, and accurately, and render scaling unnecessary; Roberts's patent liquid filling machines; Gardner's patent sifting, grinding, disintegrating, and mixing machines, for mixing colours, cements, concretes, etc.; and Coleman's patent driving gear.

The company's goods have been supplied for the following buildings:—Cheltenham Hospital; Children's Home, Bolton; General Hospital, Birmingham; Union Workhouse, Croydon; Union Workhouse, Cardiff; Borough Asylum, Leicester; King's College Hospital, London; North Evington Infirmary, Leicester; County Asylum, Preston; Royal Infirmary, Manchester; Royal Infirmary, Edinburgh; Camberwell Workhouse; Western Infirmary, Glasgow; Guy's Hospital, London; University College Hospital; etc., etc.

SECTION THREE.

Bricks, Clay, and Glass Tiles, Terra-Cotta, and Roofing Materials. Asphalte and Damp-courses. Felts. Reinforced Brickwork. Marble. Stone. Mosaic, etc., etc.



"THE BUILDERS' JOURNAL" STAND MARKED THUS ✚

The following firms are noticed under this section, and their stands are shown blacked in, with numbers in white :—

104	F	Art Pavements and Decorations, Ltd. (The), p. 358.
186	K	Atlas Stone Co., Ltd. (The), p. 358.
43	C	British Stone and Marble Co., Ltd. (The), p. 358.
69	D	Brook, F. H., p. 358.
75	E	Carter and Co., p. 359.
112	G	Colthurst, Symons and Co., Ltd., p. 359.
32	B	Daneshill Brickworks (The), p. 359.
39	C	Dawson and Co., Ltd., p. 359.
227	O	Durolite Co. (The), p. 360.
216	N	Exley, William, and Son, p. 360.
253	Q	Fireproof Partition and Spandrel Wall Co., p. 360.
276, 268	S	Forest of Dean Stone Firms, Ltd., p. 360.
191	L	Graves and Co., Ltd., p. 361.
1	A	Hazelwood Brick Co. (The), p. 361.
278, 279	Wall Space Annexe	India Rubber, Gutta Percha and Telegraph Works Co., Ltd. (The), p. 361.
258	R	Johnson (Richard) Clapham and Morris, Ltd., p. 361.
64	D	Kleine Patent Fire-resisting Flooring Syndicate, Ltd., p. 362.
223	O	Lawrence, Thos., and Sons, p. 362.
44	C (Ground Floor)	McNeill, F., and Co., p. 362.
10	A (Gallery)	
224	O	Maenofferen Slate Co., Ltd. (The), p. 362.
110	G	Major, H. J. and Co., Ltd., p. 363.
150	Wall Space	Manu-Marble Co., Ltd. (The), p. 363.
34	B	Mitchell, Thomas, p. 363.
18	B	Moderina Patent Glass Tile Co., (The), p. 363.
106	G	Nelson Watson, Ltd., p. 364.
68, 69	D	Newellite Glass Tile Co., p. 364.
81	E	Norris, C. H., Ltd., p 364.
116	G	Nostel Brick and Tile Works, p. 364.
116	G	Pascall, Thos., and Son, p. 365.
274	T	Popham, Mrs. M. L., p. 365.
101	F	Ruberoid Co., Ltd. (The), p. 365.
115	C	Sankey, J., and Sons, Ltd., p. 365.
16	(A Ground Floor)	Seyssel and Metallic Lava Asphalte Co., Ltd., p. 366.
1	B (Gallery)	
73	D	Stanley Bros., Ltd., p. 366.
119	G	Thomas, W. M., and Co., Ltd., p. 366.
118	G	Towers' Adamantine Clinker, Fire and Roofing Tile Co., p. 366.
42	C	Vulcanite, Ltd., p. 367.
45	C	Willesden Paper and Canvas Works, Ltd. (The), p. 367.
219	N	Woolliscroft, G., and Son, Ltd., p. 367.

REFERENCES.

The following firms are noticed in other sections, but are showing exhibits connected with this one. Their stands are indicated by hatching :—

215	N	British Uralite Co. (1908), Ltd. (The), p. 369.
139	H	Daymond, John, and Son, (Stone Carving), p. 370.
250, 251	Q	Doulton and Co. Ltd. (Carrara Ware, Terra-cotta), p. 394.
72	D	Emdeca Sanitary and Artistic Decoration Co., Ltd. (Metal Tiles), p. 398.
146	Wall Space	Fawcett, Mark, and Co. ("Edwardian" Chimney-pot), p. 371.
233	O	Guild of Decorators' Syndicate, Ltd. (Mosaics), p. 391.
109	G	Hülsen, Julius and Co. (Brickmakers' Chemicals), 109 G.

THE ART PAVEMENTS AND DECORATIONS, LTD., 7, EMERALD STREET, THEOBALDS ROAD, LONDON, W.C.

STAND 104. ROW F.

The Art Pavement and Decorations Company's exhibit comprises five sections, and as a whole is one of unusual interest. The marble section is, perhaps, the most important of the series, and consists of a display of nearly 100 variously coloured marbles, suitable for all descriptions of decorative work. As some of these marbles are comparatively little known, architects should avail themselves of the opportunity of inspecting them. For walls and floors, the Siberian Green, which is very richly marked and exceedingly hard, is particularly well adopted.

In the mosaic section is a sample illustrating the Roman mosaic paving now being laid by the firm at the Victoria and Albert Museum from the designs of Sir Aston Webb, R.A., and should be specially noted by visitors.

Exhibits of parquetry and Armadek composition flooring, which is jointless, fireproof, and low in price, are also well worth attention.

Conspicuous among the exhibits in the tile section are the dull glazed Medmenham tiles, and a new hydraulic tile with a grooved non-slipping surface, for use in factories, swimming baths, and stairways.

The following is a list of buildings (with their architects) in which this company has executed work:—War Office, London, Sir John Taylor, K.C.B., and Clyde Young; Admiralty Buildings London, Leeming and Leeming; Imperial Institute, London, Thomas E. Colcutt; St. Thomas's Hospital, London, Percival Currey; Patent Office, London, Sir Henry Tanner; Houses of Parliament, Sir John Taylor, K.C.B.; Royal Albert Hall, London, Hunt and Steward; Royal Alexandra Hospital, Rhyl, A. Waterhouse and Sons; St. Mary's Hospital, Paddington, Sir William Emerson, etc.

THE ATLAS STONE CO., LTD., COLDHAM'S LANE, CAMBRIDGE. STAND 186. ROW K.

Artificial paving stones, at one time regarded with the intense suspicion that awaits any and every innovation, are now universally adopted. Their regularity of shape and surface, their economy in cost of production and in labour of laying, and other advantages, were obvious from the outset. The only question was, would they endure the test of time—would they wear and weather well? Time has shown that in this respect they are vastly superior to natural stone. This was long ago proved theoretically, and it has now been abundantly demonstrated in practice.

The Atlas Stone Co., Ltd., of Cambridge, have arranged a glass-covered stand showing numerous samples of their Atlas "Foothold" Paving Slabs, which are manufactured in Leicestershire granite concrete, for public footway pavings, etc.

These slabs are subjected to hydraulic pressure, and an examination of the numerous cut samples (taken from the ordinary stock of the company) shows the paving to be of fine and close textured concrete, evenly mixed and of uniform appearance.

The company exhibit a certificate of a test taken by Messrs. Kirkaldy, who, in crushing a sample of Atlas stone, certify a result of 12,970lbs. per sq. inch, equivalent to 834 tons per sq. ft.

A slab cut for a coal plate cover shows the facility with which the concrete may be tooled. Samples of the graded granite chippings and the cement used are also included in the exhibit.

Atlas stone paving has been extensively used for footways by over one hundred Borough and Urban District Councils, in London and the provinces, among which may be named the Enfield, Hamersmith, Lewisham, Wood Green, and East Ham Councils.

THE BRITISH STONE AND MARBLE CO., LTD., 11 AND 12, FINSBURY SQUARE, LONDON, E.C.

STAND 43. ROW C.

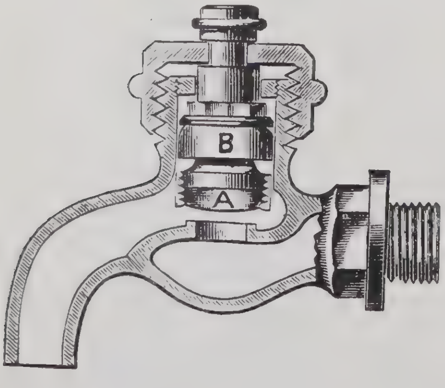
It is pointed out that this firm's exhibit—a water temple and fountain in 18th century Renaissance style—is entirely constructed of true stones, under conditions similar to natural geologic agencies, by a patented process, by means of which the geologic change extending over ages has been enormously shortened in point of time and placed under absolute control. Nothing is added to the material that is not present in the natural stone; it contains no cementing medium other than that found in the productions of nature. It should therefore be void of offence to those purists who urge a rather belated objection to artificial products, and who somewhat inconsistently make their protest in the name of art!

This exhibit is a very remarkable one, and includes specimens of various stones manufactured by this company in such close imitation of the natural materials that in formation, structure, and characteristic features, the differences are practically indistinguishable. What is perhaps more astonishing still is that Mr. J. Allen Howe, B.Sc., F.G.S., the curator of the Geological Museum, to whom a sample of reconstructed stone was submitted, has been able to report that the perfect cohesion throughout the whole mass was due to the uniformity of the crystallisation of the carbonate of lime in the matrix. Tests conducted by this gentleman with hydrochloric acid confirmed this fact.

Blocks can be produced to any depth in bed, and with an entire absence of lamination. In structure the stone is homogeneous, and contains no cementing mediums other than that found in natural stone.

Marble, free from flaws and vents, with markings and colouring true to nature, is also manufactured by the Company.

F. H. BROOK, 11, QUEEN VICTORIA STREET, LONDON, E.C. STAND 69. ROW D.



At this stand are exhibited several assortments of bricks made by various brick companies. Those of the Burlesdon Brick Co. include sand-faced hand-pressed red facings and hard red wire-cut common bricks. The red facings are remarkably free from sand flaws, and are of a deep colour, and the wire-cut are specially adapted for general building and engineering work.

The West End Brick Co.'s red wire-cut bricks—as used by the London County Council and a number of canal, gas, chemical, and sewerage works—are also shown, in addition to a selection of samples of bricks made by the Blisworth Brick Co., which latter have been extensively used by the Metropolitan Water Board and numerous public authorities, corporations and councils.

A speciality to be also seen at this stand is Garrett's "Ideal" screwdown tap, which possesses several novel features, and is deserving of the special attention of the profession. As will be noticed, the chief difference between this tap and that of the ordinary type is the absence of a screwed spindle. This tap has a smooth piston which does not turn, but is raised or lowered (quite independently of the water pressure) by the strong coarse screw of the cap. It is this cap which takes the whole of the pressure, and as it never fails to open the valve, the tap is equally advantageous for high or low pressure services of either hot or cold water.

This exhibit is sure of the suffrages of the householder, as well as those of the house builder. The average draw-off tap is a chronic nuisance because of its many infirmities, for which due allowance is not often made by the users; not the least of which is the waste it creates of water, time, and temper. The tap here shown promises a happy deliverance in both senses.

CARTER AND CO., LTD., POOLE, DORSET; 29, ALBERT EMBANKMENT, S.E.; AND 100, DEANSGATE, MANCHESTER. STAND 75. ROW E

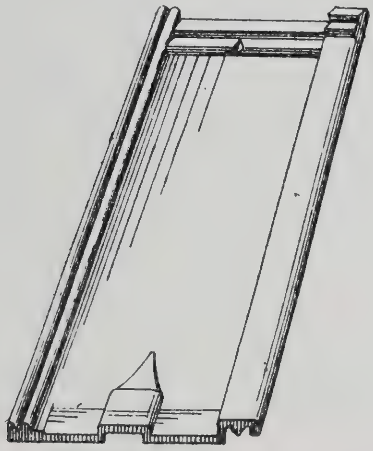
Interspersed with the many matters of purely practical interest at the exhibition, there is a goodly sprinkling of objects that are of purely artistic claims to attention. There is also the usual "third thing," the object that is a delightful blend of *utile et dolce.*

The exhibits at Messrs. Carter's stand, where they are not purely artistic, partake of this happy mixture. Their tiles for floors, walls, and fireplaces, exhibit great variety of design and colouring, but are invariably in excellent taste. They are marked, too, by a strong though by no means an aggressive individuality of style and treatment. There is, in fact, in all Messrs. Carter's productions that indefinable something that, for want of a better term, is called character.

The exhibit includes, besides all kinds of floor, wall, and fireplace tiling, many specimens of constructional faience and semi-glazed terra-cotta; of red, buff, grey, and salmon terra-cotta; of lustres, monastic and Anglo-Dutch glazed tiles; of marble and ceramic mosaics and Petropine flooring; and, above all, there are some most attractive specimens of the Carter fireplaces, such as adorn many an interior of the "stately homes" of England—and of other countries; "stately," some of them, purely by virtue of this central feature.

The following is an abbreviated list of some contracts carried out by Carter and Co., Limited, in the first quarter of 1909. The name of the architect is given in parentheses:—Royal Portsmouth Hospital (C. W. Bevis); Ipswich and East Suffolk Hospital, floor and wall tiling (H. Percy Adams); L. and S.W. Railway Servants' Orphanage, Woking (W. E. Trevena); Lunatic Asylum, Lahore, white glazed wall tiling (H.M. Secretary of State for India); Medical College, Calcutta, surgical block (H.M. Secretary of State for India).

COLTHURST, SYMONS AND CO., LTD., BRIDGWATER. STAND 112. ROW G.



If "Ballymaclinton," the ultra-Irish village at the Franco-British Exhibition, owed two-thirds of its charm to the beauty of the imported Irish colleens, the other third appears to have been indigenous to the land of the Sassenach. The reference is, of course, to the picturesque tiled roofs. Those tiles came from Bridgwater, and were supplied by Messrs. Colthurst, Symons and Co., who thus enjoyed an excellent opportunity of demonstrating beyond cavil to an enormous public the merits of their patent Acme tile.

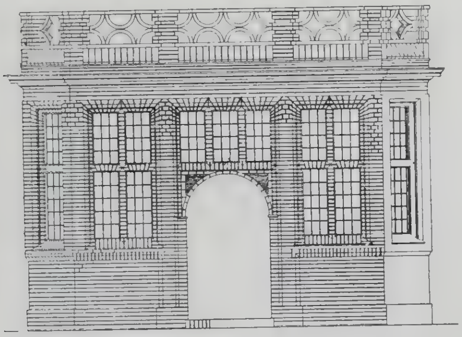
It is not surprising that our ideas upon roof coverings, as upon almost every other detail of building construction, should be undergoing revision. The slate roof, with its many undeniable merits, has many equally incontrovertible disadvantages; and it represents a somewhat primitive system. It is therefore very natural that many ingenious attempts to improve upon it have been made, with more or less success. Besides, there are circumstances in which tiles are decidedly preferable to slates; and, fortunately, in such cases, the inventor has come to the rescue with newer and better forms of this class of roof-covering.

At this stand may be seen a miscellaneous collection of clay goods, among which the patent "Acme" tile—which was used throughout the Irish Village at the Franco-British Exhibition—is deserving of special attention. It is quite a recently patented tile, and possesses the merit of being very easily laid.

The patent "Paragon" tile, of which an illustration is given, has been recently used by the Admiralty for re-roofing some barracks at Guildford.

There are various other interesting exhibits displayed at this stand, including the patent interlocking Roman tile, which has been extensively used for church and other roofs.

DANESHILL BRICKWORKS, BASINGSTOKE. STAND 32. ROW B.



STAND DESIGNED BY EDWIN L. LUTYENS, F.R.I.B.A.

Professional men will not require to be told that the brick pavilion which comprises this firm's exhibits is from the design of a capable architect. The author is Mr. E. L. Lutyens, who was the first to use the bricks made at the Daneshill Works, and whose advice in the matter of manufacture has been followed since their establishment five years ago.

As will be seen from an examination of the bricks used in the construction of the pavilion, they are entirely hand made, and in texture, colour and size suggest in an unusual degree the old bricks of the 16th century. The clay is dug many months in advance, hand-tempered (to prevent too fine a texture), and the bricks burnt in old-fashioned Scotch kilns.

The following are some of the buildings (and their architects) for which Daneshill bricks have been used: Shop, Kensington High Street, F. S. Chesterton; lodge, Sevenoaks, F. S. Chatterton; house, 51, Grosvenor Square, Messrs. Balfour and Turner; church, London, Messrs. Balfour and Turner; church, Suffolk, F. G. Eden; house, Gloucestershire, Messrs. Emden and Egan; two houses, Silchester, N. Evill; house, Teddington, A. Jessop-Hardwick; house, Berkshire, W. L. Lucas; Marsh Court, Stockbridge, E. L. Lutyens; New Place, Botley, E. L. Lutyens; Barton St. Mary, East Grinstead, E. L. Lutyens; Daneshill, Old Basing, E. L. Lutyens; garden, Suthamstead, E. L. Lutyens; Hampstead Garden City, E.L.Lutyens; Dormy House, Walton Heath, E. L. Lutyens; house, Walton Heath, E. L. Lutyens; house and park wall, Nettlebed, C. E. Mallows; house, Hampshire, Ernest Newton; house, Shrewsbury, E. Newton; Mausoleum, Paul Phipps; Harefield House, Middlesex, Paul Phipps, etc.

DAWSON AND CO., LTD., MENDIP WHARF, BATTERSEA, LONDON, S.W. STAND 39. ROW C.

Among the changes in taste of recent years no instance is more remarkable than that which has banished from favour the old-fashioned London stock-brick. There are signs, however, that architects are returning to their former appreciation of its many excellent qualities, and at this stand Messrs. Dawson exhibit various panels of brick-work executed in malms and different grades of stock stocks, which will prove of great interest to the profession.

There are numerous specialities on view at this stand, such as "Klinkerite" partition blocks, "Asbestos Cement" slates and slabs, and many novelties in sanitary appliances. Among these may be noticed five types of gullies, each possessing distinct features in design—inspection eyes, an improved rain-water shoe, etc.

In addition to the above, this firm exhibit their "Ephos" ware channel pipes and bends, which are made in a variety of patterns, and a large selection of sinks, lavatory basins, etc.

Messrs. Dawson and Co. have supplied sanitary fittings, etc., to the following:—H.M. Admiralty, H.M. Office of Works, London County Council, Metropolitan Water Board, Paddington Borough Council, Marylebone Borough Council, Wandsworth Borough Council, Fulham Borough Council, Battersea Borough Council, Lewisham Borough Council, Chelsea Borough Council, London and South-Western Railway Co., leading London contractors, St. George's Union and Infirmary, Fulham; Fulham Smallpox Hospital; numerous schools for the London School Board.

THE DUROLITE CO., 2, CHURCH ROW, LIMEHOUSE, LONDON, E. STAND 227. ROW O (ANNEXE).

The hygienic surface such as these tiles present, is an indispensable feature of modern building and decoration. Where the tiles are perfectly plain, they are goodly to look upon, because they are cleanly, and give a comfortable assurance that they harbour nothing that is injurious to health.

So strong has this predilection become, that tiles to-day are used more extensively, and for a greater variety of services, than ever before. One finds them in common use not merely in hospitals and other public institutions, but in the bathrooms and kitchens and even in other apartments of private houses.

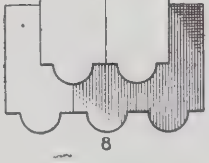
As for business premises, that tradesman is foolish who, if he deal in things that are for eating or drinking, has failed to perceive the wonderfully attractive effect of neatly tiled walls. They inspire confidence in the customer as a guarantee of cleanliness and purity.

At this stand "Durolite" opal tiles have been conveniently displayed by the Company, which has erected a wall (10ft. long by 10ft. high) whose surface is finished with white opal above, and the firm's marble tiles—in the form of a dado—below.

Special attention is directed to the patent "Grip" or "Key" backing, which, being absorbent and having a different co-efficient of expansion from the tiles, possesses a certain elasticity, and prevents them from cracking or crazing. The surface is impervious to moisture and heat, and being non-absorbent and without "surface glaze," does not gather dirt or become dingy with use.

The tiles may be had not only in white, but in various plain tints, besides in imitations of marbles and granites. Some of the decorative designs in stock are very good, and architect's own designs can be carried out if desired.

WILLIAM EXLEY AND SONS, BROSELEY, SHROPSHIRE. STAND 216. ROW N (ANNEXE).



Messrs. Exley and Sons' exhibit takes the form of a building specially designed to provide opportunities for displaying their well-known Broseley roofing tiles and vertical hanging tiles—"Coalport-Broseley" brand—both smooth-faced machine made, and genuine hand-made tiles. The application of springers, external, internal and octagonal angles, gable angle tiles, and other special forms necessary for meeting the requirements of modern roof tiling, is illustrated in a very practical manner. Among the latter should be noted one that diminishes, known as the "Tower" tile, for use on spires or other tapering roofs.

There are also selections of ridge tile finials of varied patterns, ornamental roofing tiles, plain and ornamental ridge tiles, hip-end ridge tiles, quoins for bays and tops of hips, and the ordinary forms of channel and coping bricks.

The following are a few of the buildings recently covered in with William Exley and Sons' "Coalport-Broseley" tiles; St. Andrew's Church, Worthing, Sussex; St. Ronan's College, Worthing, Sussex; Roman Catholic Cathedral, Cambridge; Holy Trinity Church, Wanstead, Essex; Chigwell Church, Woodford, Essex; Borrowash Church, near Derby; Mongewell Mansion, Wallingford, Berks.; Arthur Road Schools, Beckenham, Kent; new Railway Station, Harrow, Middlesex; Commercial Travellers' Schools, Pinner; new Railway Stations, Buenos Ayres, South America; Grange-Gorman Barracks, Dublin, Ireland; Bow Schools, Stratford, London; King's Palace, San Sebastian, Spain; Wellington College Gymnasium, Wellington, Somerset; Walmer Church, Kent; St. George's Church, Cannes, France; New Lodge, Six Mile Bottom, Cambridge; Norwich Barracks, Norwich, etc.

THE FIREPROOF PARTITION AND SPANDREL WALL CO., BANK CHAMBERS, 92, TOOLEY STREET, LONDON BRIDGE, S.E. STAND 253, ROW Q.

It will no doubt be found, on a complete survey of this Exhibition, that it affords, on the whole, the most complete exposition of reinforced concrete construction that has yet been vouchsafed to us; and the variety and ingenuity of the manifestations in this kind will surely come as a revelation to those who have not watched the movement so closely as regular readers of this journal have been enabled to do.

One of the most remarkable applications of reinforcement to brickwork is to be seen at this stand, where this Company has erected a brick wall (2¾ins. thick) which is 28ft. long and is supported at the ends only. The principle of construction involves a combination of brick, hoop-iron, and cement-mortar, framed together in such fashion as to form a solid slab. Placed about eighteen inches apart in horizontal as well as vertical directions, the hoop-irons do not penetrate or have any sort of attachment at their points of crossing.

This system has been successfully used for a variety of structures—mostly of light and temporary descriptions, and is specially adapated to garden and boundary walls, where the supporting stanchions need not be closer together than 10ft. apart.

This system of construction has been adopted in the following buildings:—Four houses at Letchworth Garden City; house at Roply, Hants; Royal Engineers' Pavilion, Aldershot; partitions for War Office at Royal Arsenal, Woolwich; partitions, etc., Weston Street, S.E.; partitions, etc., Knightrider Street, Queen Victoria Street and many other places in London and suburbs; patent walls, etc., Manchester, Mosley Hotel; boundary wallings, Edinburgh, Bromley, Fulham; partition walls, Avonside engine works, Bristol; etc.

FOREST OF DEAN STONE FIRMS, LTD. 44, HIGH STREET, BRISTOL. STANDS 267 AND 268. ROW S.

At these stands are to be seen samples of the various building and other stones which are quarried by these firms, and include the following:—

Grey and Blue Forest of Dean Stone.—These quarries are situated in the valleys of the Forest of Dean, Gloucestershire, and the stones obtained from them are used for all kinds of building, engineering, and monumental purposes. Both colours are found in the same quarries, but the blue is the harder stone.

Red Wilderness Stone.—This is only found at Mitcheldean, Gloucestershire, and is one of the best-known sandstones in the country.

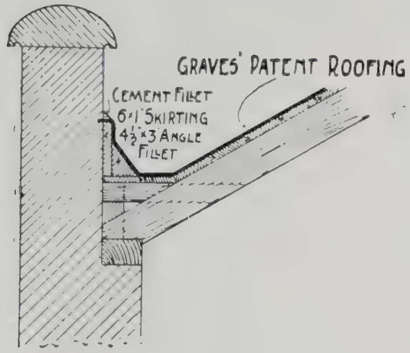
Mountcharles Stone is quarried in County Donegal, Ireland. When quarried, this stone is of a full cream colour, but after a few years' exposure it becomes white.

Nailsworth Stone.—This is a durable stone, somewhat resembling Portland.

Bristol Pennant Stone, Keinton Stone, and Porthgain Granite Macadam.—The last named is a Welsh material, much used for road-making.

The following is a list of buildings (with their architects), in which the stones mentioned have been used:—Stanhope House, Park Lane, W., Romaine-Walker and Besant; Robinson and Cleaver's new premises (back elevation), King Street, Regent Street, W., Crickmay and Sons; new shop premises, Hans Crescent, Brompton Road, S.W., R. Bennett; new bakeries, Steward Street, Brushfield Street, Bishopsgate Street, E.C., F. Adams Smith; Nugget Polish Factory, Vauxhall Street, Kennington, S.E., F. A. Powell; Littleton Bridge, Shepperton, for the Middlesex County Council, H. T. Wakelam; 18, Little Britain, Newgate Street, E.C., Rolfe and Matthews; boundary walls and piers, new "Morning Post" Homes, New Kent Road, S.E., and new shop premises for Messrs. Grose Bros., Ltd., Walworth Road, S.E., G. A. Lansdown; Lady Bruce Memorial Church, All Saints, Tooting, S.W., Temple Moore; extensions Gas Works, Croydon, Surrey, H. C. Helps; New Long Grove Asylum, Epsom, Surrey, for L.C.C., G. T. Hine; Abbey Street Dwellings, Bermondsey, for S.E. Railway Co., Humphreys-Davis and Co.; new County Court Offices, Croydon, Surrey, Sir Henry Tanner; new Public Baths, for the Camberwell Vestry, Old Kent Road, S.E., E. Harding Payne; new warehouse, Blue Anchor Lane, Bermondsey, S.E., and various other warehouses, Edward Crosse; stabling, farm buildings, cottages, etc., Tandridge Court, Oxted, Surrey, F. S. Brereton and Son; new Sessions House, Old Bailey, E.C., E. W. Mountford; alterations to St. George's Church, Borough, London, S.E.; Highways Depot, Croydon Road, Penge, S.E., H. W. Longdin; Nos. 43, 45, 47, and 49, High Road, Harlesden, N.W.

GRAVES AND CO., LTD., WATERFORD, IRELAND. STAND 191. ROW L.



Messrs. Graves and Co.'s connection with asphalte roofing dates back for nearly half-a-century, and they were the original manufacturers of it in the United Kingdom. In the early days it was known as "Danish Asphalte," because it was imported from Denmark, in which country its use for roofs of all descriptions had long been known. Experience has shown that any departure from the formulæ originally used by the Danish manufacturers, or any attempt to hasten or cheapen its production has resulted in a falling-off in quality, and it will surprise visitors to be told that it is now manufactured by the same primitive methods as it was fifty years ago, each piece being separately made by hand, and separately air-dried.

At this stand the company are exhibiting several models, one which shows a lattice girder roof covered with their patent roofing. Others illustrate a couple of flat roofs covered with two layers of the material treated with mastic between the layers, and finished with mastic composition and sand. The main points about Graves's Patent roofing are that it forms a permanent fireproof roof covering, adaptable to any pitch.

Among the exhibits are sample rolls of Graves's patent fibrous asphalte dampcourse. The following is a short list of buildings in which the company's material has been used:—Dock sheds, Canada dock, Liverpool (Mersey Docks and Harbour Board); Irish International Exhibition, 1907; new passenger station, Rosslare Harbour, G.S. and W. Railway; chemical works, The United Alkali Co.; new station at Waterford; carriage sheds, Wakefield (Lancashire and Yorkshire Railway); factory buildings, Manchester, Charles Caine, M.S.A., architect; Messrs. W. and H. Goulding, chemical works, Dublin and Cork; Glasgow International Exhibition, 1901; goods store, Liverpool, Lancashire and Yorkshire Railway; goods store, Belfast, Midland Railway; engineering shop and gas plant works, Crossley Bros., Manchester; cement store, Associated Portland Cement Co., Ltd.; copper works, J. H. Dennis and Co., Ltd., Widnes, also Bordeaux; sawmills, Messrs. Eustace and Co., Ltd., Cork; etc.

THE HAZELWOOD BRICK CO., CRANLEIGH, SURREY. STAND 1. ROW A.

The position occupied by this firm's stand at the exhibition is surely of good augury. The goods displayed on Stand 1, Row A, should certainly be A1. They appear to be quite worthy of this designation.

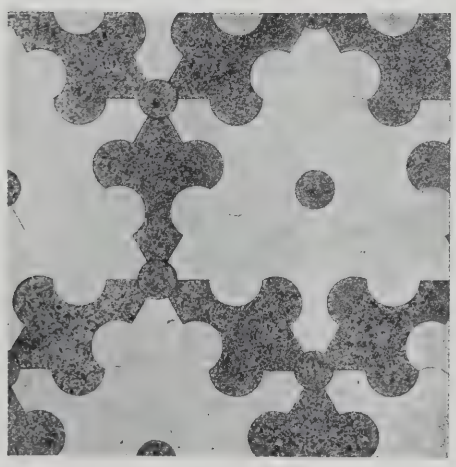
The bricks of which samples are shown consist of red, hand-moulded, sand-faced building bricks, of the "H.B.C." brand. These are of high quality, and are made in two sizes—namely, 9ins. by 4⅜ins. by 2 11-16 ins., and also 9ins. by 4⅜ins. by 2ins. They are manufactured in three different shades, and are of great durability and excellent appearance. They are in three shades—dark red, medium, and light, the last-mentioned being specially suitable for facing interiors of churches and public buildings.

There are also shown moulded bricks of various descriptions, purple stock bricks for facings, hard channelled bricks for paving stables, etc., hard wire-cut bricks for paving and engineering work; and stock bricks for ordinary purposes.

The large collection of tiles shown includes hand-made sand-faced red roofing tiles in three shades (a beautiful old-fashioned variety of the H.B.C. brand); the same with nibs; machine-made partial sand-faced tiles, in three shades, with nibs; common wire-cut tiles, ribbed; various descriptions of ornamental and ridge tiles; agricultural and socket pipes; and terra-cotta goods.

THE INDIA RUBBER, GUTTA PERCHA AND TELEGRAPH WORKS CO., LTD., 106, CANNON STREET, LONDON, E.C

STANDS 278 AND 296. WALL SPACE (ANNEXE).



This company's exhibit comprises a variety of rubber goods, such as w.c. plugs, hose, tubing, and steam packing, and more particularly a display of india rubber tiling and stair nosing. The floor of the stand is occupied by the company's new patent "Mosaic" india rubber tiling, and a part of the exhibit is designed as a bath-room, the floor of which is laid with a "Lily" design in this material, surrounded by ordinary black and white rubber octagons and square tiles. The thickness is either ⅜in. or ½in., according to the pattern selected, and the fixing is accomplished with the aid of a special cement supplied for the purpose. India rubber tiles, being noiseless and pleasant to walk on, and perfectly sanitary and waterproof are specially suitable for bath-rooms, pantries, etc. The colours extend through the whole thickness, so that the pattern remains permanent.

The following is a list of a few buildings in which this company's ordinary india rubber tiling is laid:—"Adelphi" Hotel, Liverpool; Alliance Marine and General Assurance Co., Ltd., Capel Court, London; Messrs. Barclay's Bank, Doncaster; Messrs. Beckett's Bank, York; Birkbeck Bank, London; Messrs. Brown, Shipley, and Co., 123, Pall Mall, London; "Colonial House," Liverpool; India Rubber, Gutta Percha, and Telegraph Works Co., Ltd. (warehouse), 100, Cannon Street, London, E.C.; Messrs. L. D. Nathan and Co., Auckland, New Zealand; National Provincial Bank, Liverpool; Phœnix Assurance Co.'s offices, Charing Cross, London; Royal Bank of Scotland (strong room), London; Sun Fire Insurance office, Newcastle-on-Tyne; Turkish Baths, 76, Jermyn Street, London, S.W.; "White Star Line" offices, Liverpool; Yorkshire Insurance Co.'s offices, Princes Street, London.

RICHARD JOHNSON, CLAPHAM AND MORRIS, LTD., 24 AND 26, LEVER STREET, MANCHESTER.

STAND 258. ROW R.

The reinforcement of brickwork by so simple a method as the introduction of wire mesh between the joints is the outcome of the close attention which reinforcement generally has received at the hands of constructional experts. Dating from as recently as 1906, "Monolithic Brickwork" (as the patentees name this ingenious system of construction), has already established a position for itself, but the well-known conservatism of architects needs to be overcome, if its application is to become general.

According to the results revealed after very severe tests, a very remarkable increase of both tensile and compressive strengths is developed in brickwork reinforced in this particular manner, and the outstanding advantage of the system is that any builder can apply it.

This reinforcement consists of a galvanised steel wire netting band 2ins. to 2½ins. wide, which is inserted in the mortar joints of ordinary brickwork. An ordinary brick wall reinforced in this way is capable not only of carrying itself, but of carrying a heavy superimposed load one week after it is built. It is possible to build a 9in. cavity wall in "H.B." brickwork, which is five times as strong as an ordinery 14in. wall, and, moreover, it is damp-proof. The way in which the "H.B." system of reinforced brickwork can be built into a concrete or brick column is well shown.

Internal partition walls are a great feature of the reinforced system. A 7½in. wall consisting of two "H.B." brick-on-edge walls with a 1½in. cavity, is rendered practically soundproof, and preserves an even temperature.

Johnson's reinforced concrete lattice is also well displayed, with illustrations showing some of the work carried out in Johnson's concrete lattice.

As we have recently described and illustrated this system, our readers are probably familiar with its merits. They will also have noted with interest the account of the tests that we have published in a recent issue. It is, therefore, unnecessary on the present occasion to give fuller details.

THE KLEINE PATENT FIRE-RESISTING FLOORING SYNDICATE, LTD., 133 TO 136, HIGH HOLBORN, LONDON, W.C STAND 64. ROW D.

KLEINE
PATENT FIRE RESISTING CONSTRUCTION
KLEINE
PATENT FIRE RESISTING CONSTRUCTION

While the principle of reinforcement as applied to concrete has been, and is still, engaging the attention of constructional engineers, much has been done for many years in the direction of strengthening by similar means ordinary brickwork. At this stand can be seen the particular method patented by the Kleine Syndicate, and the exhibit demonstrates that ferro-brickwork has great possibilities and advantages. It can be applied to floors, roofs, and staircases, and, in fact, every form of horizontal or sloping construction.

The essential feature of the Kleine Patents consists in constructing perfectly horizontal floors, without arch or camber, with ordinary rectangular bricks (usually hollow), which are neither keyed into each other, nor have any other peculiarities of shape. By means of thin iron tension bands, placed on edge and inserted in each joint, spans of immense strength and great width can be constructed.

The following are some of the contracts which have since been, or are about to be, carried out :—Imperial Hotel, London, Chas. Fitzroy Doll, F.R.I.B.A., 5, Southampton Street, London, W.C. ; warehouse, Hatton Garden, Niven and Wigglesworth, FF.R.I.B.A., 104, High Holborn, London, W.C. ; dwelling-house and factory, Leman Street, E., R. W. Hobden, 34, Finsbury Square, London, E.C. ; motor works, Eden Street, N.W., R. W. Hobden, 34, Finsbury Square, London, E.C. ; cabinet works, Tottenham, S. Clifford Tee, F.S.I., 50, Moorgate Street, London, E.C. ; drying kilns, Tottenham, S. Clifford Tee, F.S.I., 50, Moorgate Street, London, E.C. ; accumulator room, printing works, Wolverton, S. Clifford Tee, F.S.I., 50, Moorgate Street, London, E.C. ; factory, High Wycombe, S. Clifford Tee, F.S.I., 50, Moorgate Street, London, E.C. ; timber sheds, Kingsland, W. Stone, 2, Gt. Winchester Street, E.C

THOMAS LAWRENCE AND SONS, BRACKNELL, BERKSHIRE. STAND 223. ROW O.

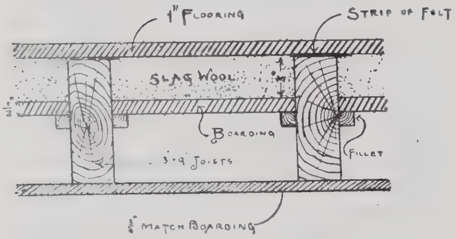
Messrs. Lawrence and Sons exhibit an entrance doorwoy (of cut and rubber brickwork), in which their T.L.B. rubber bricks show to advantage. The accurate jointing of the arch voussoirs and the good face work are especially noticeable.

This firm also exhibits a recently introduced make of sand-faced roofing tiles, produced in varied shades of red and also of dark brownish blacks. Architects desiring "ready-weathered" tiles should find the latter of interest.

T.L.B. sand-faced facing bricks are well represented. Some of these are of new shades of colour, among them being dark mixtures of colour (produced by special burning), intended to make new work look as old as possible. These bricks can be obtained of standard size and also of 2ins. thickness if required.

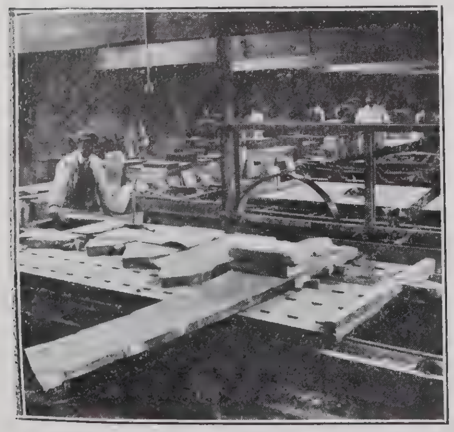
The following are some of the buildings, with their architects, in which T.L.B. bricks have been used : Police dwellings, New Street, Bishopsgate, Sydney Perks, F.R.I.B.A. ; new workhouse, Acton Lane, N.W., A. Saxon Snell, F.R.I.B.A. ; new workhouse infirmary, Plymouth, Messrs. Thornley and Rooke ; Convent of Notre Dame, Southwark, S.E., J. C. Radford ; Mortlake schools, Richmond, Messrs. Jarvis and Richards ; Surrey County Council School, Westfield, Woking, Messrs. Jarvis and Richards ; Orthopœdic Hospital, Gt. Portland Street, W., Rowland Plumbe, F.R.I.B.A. ; new house, Wimbledon Park, C. Worby Beaumont, A.R.I.B.A. ; Hackney Downs secondary school, Downs Park Road, Hackney, N.E., T. J. Bailey, F.R.I.B.A. ; new casual wards and receiving workhouse, Sheffield Street, W.C., A. A. Kekwick, M.S.A. ; Beaufoy Institute, Princes Road, Lambeth, F. A. Powell, F.R.I.B.A., F.S.I. ; central library, Hackney, H. A. Crouch, A.R.I.B.A. ; Berner's Hotel, Berner's Street, W., Messrs. Slater and Keith ; new Congregational Church, Henley-on-Thames ; etc., etc.

F. McNEILL AND CO., LAMB'S PASSAGE, BUNHILL ROW, LONDON, E.C. GROUND FLOOR, STAND 44. ROW B GALLERY FLOOR, STAND 103. ROW B.



Roofing felts, damp-proof coursing, linings for reservoirs and other objects, insulating materials, etc., are shown at these stands in considerable variety, in the form of raw materials as well as of the manufactured products of the "Lion Brand." The asphaltic roofing felt of this brand, for exterior roofing, has been supplied continuously for fifty years to British Government departments. A thinner variety is used as sarking felt ; and a special bituminous hair felt is largely used for underlining roofs, for sound-deadening in floors and thin partitions, and for lining metal buildings. The firm's inodorous felt for lining roofs, etc., is quite free from offensive smell. The patent metal asphalte damp-proof course is a combination of sheet-lead and asphalte. "Lakumen" is a damp-course manufactured from pure Trinidad bitumen, without the admixture of coal-tar or coal-tar pitch ; and "Lakumen" sheeting is much in request for lining reservoirs, filter beds, tanks, subways, and the like uses. Dry hair felt is applicable to innumerable insulating and sound-deadening services ; and the patent slag wool is a fireproof material that is much in use for the insulation of cold stores, and for covering pipes and boilers ; it has been adopted by the Admiralty and War Office. Fibrous plaster slabs ; "Combinite," a special three-ply material for flat roofs ; and "Roofitte," which is elastic and durable, are all represented at these stands. McNeill's patent slag wool has been recently supplied to the following works : Imperial Restaurant, Trocadero Restaurant, Aberdeen New Market, W. Milne's Cold Store (Glasgow), Barnsley Co-operative Society's Cold Store, Barclay' Perkins' Brewery, Ind Coope's Brewery, Bass and Co.'s Brewery, Sir W. W. Wynn's Cold Store ; etc., etc.

THE MAENOFFEREN SLATE QUARRY CO., LTD. STAND 224. ROW O.



This quarry was acquired in 1861, and is worked on the underground system (peculiar to the Festiniog district) to a maximum depth of 1,500 feet below the surface, while the workings extend horizontally for about half-a-mile.

The slates produced by this company are of a deep blue-grey, and the standard thickness is six to the inch. According to tests carried out by Mr. Bertram Blount, F.I.C., the absorption of water after saturation was found to be only .18 per cent. (by weight). A fruitful source of decomposition in slates is the presence of lime, from which—with a percentage of .24—these slates may be said to be practically free.

Maenofferen slates find a large market on the Continent—particularly in Germany, Austria and Denmark, and are also exported to the Colonies. In our own country they are used by various corporations and public bodies and the leading railway companies

The following is a list of some buildings on which Maenofferen slates have been employed : New Schools, Abercynon, South Wales ; County School, Bargoed, South Wales ; New School, Luton ; Council School, Porth, South Wales ; Council School, Trealaw, South Wales ; County School, Portmadoc ; Porth Gas Works, South Wales ; Rudmore Gas Works ; Town Hall, Copenhagen, Denmark.

The roofing slates of which this exhibit consists are the product of the company's quarries at Blaeou Festiniog, North Wales. The main part of the quarry workings are in the famous "Old Vein," and the slates with which the pavilion is covered are the best from this vein, well known to the trade as "Bert Old Vein."

H. J. AND C. MAJOR, LTD., BRIDGEWATER. STAND 110. ROW G.

This firm has long been known to the profession for its patent interlocking roof tiles, and these are here exhibited of several patterns. The great advantage of the system is that the overlapping is reduced to a minimum, and the weight per square works out less than in the case of slates or Broseley tiles. The double Roman, Welbeck, and angularly corrugated patterns have been on the market for a number of years. The firm has, however, quite recently introduced an entirely new design called the "Grecian," which presents a very neat finish not unlike the Double Roman, except that the vertical ribs are parallel and flat instead of round and tapered. In this pattern the gauge of batten is the same—15in., and 95 tiles go to the square.

The rest of the exhibit comprises samples of ordinary roofing tiles, ridges, pipes, squares, and bricks of every description, including "Bath" scouring bricks.

The following is a list of buildings in which Messrs. Major's tiles have been used: King Edward VII. Hospital, Windsor; schools, Windsor; Montague Institute, Huntingdon; Clement Talbot Automobile Works, N. Kensington; Ranelagh Club Polo Pavilion, Barnes; Workmen's Dwellings, Richmond; Mission Hall, Sunningdale; Cape Copper Works, Briton Ferry; Automobile Works, Manchester; farm and other buildings, Marquess of Salisbury's Hatfield estate; farm and other buildings, Duke of Westminster's estates; Welbeck Abbey, Duke of Portland's Pemberton estate, Manchester; Government and other buildings, South Africa; Brompton Oratory; churches, schools, and convents, all over England; Clifden and Galway Railway Station buildings, Ireland; Meat Market, Birmingham; Dairy of Royal Agricultural Society of England.

THE MANU-MARBLE CO., LTD., 73a, QUEEN VICTORIA STREET, LONDON, E.C. STAND 150. WALL SPACE.

The degree of excellence—in colour and veining—attained by the makers of this remarkable artificial marble, will surprise those who do not know of it from personal inspection. As a general rule, architects shrink from using shams or counterfeits, but this is a case where the constituent parts are identical with the natural material, and it may therefore be said to be actual marble; for though a manufactured article, the chemical composition is the same, and what is more, the markings and colours go right through it.

"Manu-Marble" has only been on the market since 1907, and has already attracted wide notice in the building world. It takes a high polish, and, it need hardly be said, is entirely free from flaws.

It should prove of great interest to architects.

The following are a few of the architects and firms who have used manu-marble:—The new St. James's Hall, Great Portland Street, London; secondary schools, Denmark Road, Gloucester, W. Wood, architect; Oakenrod schools, Rochdale, Sykes and Evans, architects; H. E. Percy, King's Road, Leytonstone, Essex, new shops; Otto Monsted, Ltd., Margarine Works, Southall, decorative work, new offices; Mattock Bros., Winkfield Road, Wood Green, London, square columns; Bird and Hudson, 27, Wellington Street, Luton, flooring and dados; R. W. Smith Saville, architect, Hawkshaw Avenue, Darwen, flooring for St. Cuthbert's Church; Holtham and Whiting, 34, York Place, Leeds, flooring; F. Mellows, Marlborough Road, Sheffield, lavatory and bath room; C. Batley, Clarendon Chambers, Watford; W. E. Putman, Town Hall, Morley, manu-marble for Secondary and Technical Schools, Morley; Parker Robinson, Greengate Bridge, Barrow-in-Furness, manu-marble for hall; the Coatestone Decoration Co., 77, Mortimer Street, Regent Street, London, manu-marble dado, etc., etc.

THOMAS MITCHELL, GUILDFORD PARK BRICKWORKS, GUILDFORD, SURREY. STAND 34. ROW B.

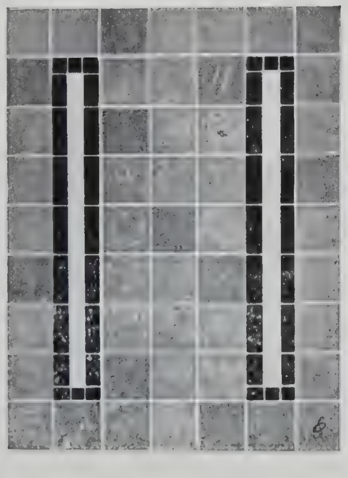
HOUSE AT WOKING. E. A. VERGE, ARCHITECT.

The growing demand for bricks and tiles which look old as soon as they leave the works has caused manufacturers to give increased attention to the production of such goods, and at this stand may be seen specimens of dark roofing tiles which are a close imitation of old ones. This firm also makes hand-made and sand-faced roofing tiles, which acquire indications of a premature age and possess quick weathering qualities. It is claimed that tiles made in this way suffer no loss as regards toughness or durability and that they do not flake—even when in very exposed situations.

Among other goods manufactured at these works may be mentioned purple facing stock bricks, as used at St. Matthew's Church, Wimbledon; wire-cut bricks, two-inch red-facing bricks, agricultural drainage pipes, etc.

The following is a list of some recent buildings (with their architects) for which bricks, etc., have been supplied:—House for Lord Colville, of Culross, Thursley, Surrey, H. Falkner (Niven, Wigglesworth, and Falkner), Farnham; Clive House, Roehampton, Surrey, C. H. B. Quennell, F.R.I.B.A., London, S.W.; St. Matthew's Church, Wimbledon, E. C. Shearman, A.R.I.B.A., London, W.; "Chantry Dene," Fort Road, Guildford, Messrs. Clemence and Moon, Guildford; "Beechmount" and "Langton," Warwicks Bench, Guildford, Messrs. Clemence and Moon, Guildford; house for Mr. Spencer Castle, Frensham, Surrey, A. J. Stedman, Farnham; house at Fort Road, Guildford, E. L. Lunn, Guildford; additions at the Royal Surrey County Hospital, Guildford, and at the Guildford Union, E. L. Lunn, Guildford; etc., etc.

THE MODERNIA PATENT GLASS TILE CO., 68, FINSBURY PAVEMENT, E.C. STAND 18. ROW B.



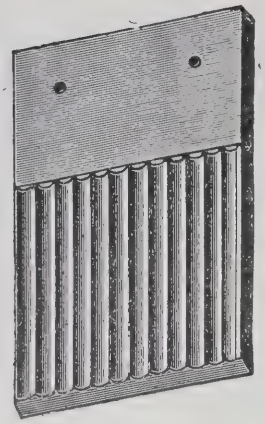
Modernia tiles are of cast glass, and are roughened at the back (by a special process) to give a good key for fixing. A point to which the attention of architects may be called is that these tiles are over ¼in. thick, and are, therefore, capable of withstanding any ordinary blow without injury. These tiles are generally 5¾in. by 5¾in., but can be made of any size, and of any shade of colour.

The public demand for glasswork decorative effect is well marked. It has probably been stimulated by certain outstanding examples of what can be achieved in this kind, as in the mosaics at St. Paul's.

Modernia tiles are rather suggestive of mosaic work, particularly in regard to texture and colour—which gives them a distinctive appearance, due in some measure to the fact that the colour goes right through. They can be employed in all cases where ordinary glazed tiles or bricks are used, and it is claimed for them that, as they are acid-proof, they are especially adapted to laboratories and certain classes of factories.

The following are a few buildings in which Modernia tiles have been fixed:—H.M. Government, Windsor Barracks; Lord Balcarres's town house; Sherburn Hospital, Sherburn, Co. Durham, J. Morson, Esq., architect, Newcastle-on-Tyne; E. Goldsmid Abrahams, Esq., "The Chestnuts," Brondesbury Park, N.W., E. A. Victor, Esq., architect, 5, Arlington Street, Piccadilly, W.; Great Northern Railway Co., King's Cross, London; The Grand Ducal Baths, Bad Nauheim; Public Swimming Baths, Strassburg; Municipal Hospital, 111, Munich; Railway Stations, Dortmund and Lubeck; Royal Cartridge Factory, Dresden; etc., etc., etc.

WATSON NELSON, LTD., NAPTON-ON-THE-HILL, NEAR RUGBY. STAND 106. ROW G.



It has been sometimes remarked that "the charm of the English village" is in great measure derived from the appearance of the thatched roofs of the cottages. Since the late Sir Benjamin Ward Richardson's rather sensational exposure of the character of the thatch, which commonly reeks with dirt and disease, the picturesqueness of the thatch makes a less potent appeal to the sensibilities than the knowledge of its inherent viciousness. But fortunately, tiles are almost equally charming, and are quite sanitary.

This exhibit consists of the several specialities made by this company, of which prominence is given to the "Windmill" brand of roofing tiles, with hips, valleys, ridges, and finials. Considerable pains have been taken in the selection for manufacture of various very useful stock shapes, which greatly assist the tiler who has awkward mitres to deal with, as in the roofs of dormers, bays, etc. There are quite a number of special forms of tiles in this section.

Attention is called to the "Fluted" faced tile, which is made with vertical channels for about two-thirds of its length, at which point they stop square, the remainder of the tile being plain. The grooves ensure the equal distribution of rain over the surface of the tile, and while driving rain is retarded by their square terminations, it is drained back by the channels.

Other exhibits include common red and pressed bricks, red adamantine and common quarries, agricultural pipes, etc.

Windmill roofing tiles have been specified for the following:—The new fire station and municipal offices, "Royal Borough of Windsor"; St. John's Church, Clevedon; new infectious hospital, Abingdon-on-Thames, Lowther and Glebe Estates, Barnes; Council Schools, Warwick and Stockton; Schools, Newbury, etc., etc.

THE NEWELLITE GLASS TILE CO., LTD., SHENTON STREET, OLD KENT ROAD, S.E. STAND 68. ROW D.

This firm is showing, in addition to numerous panels, a section of tunnel work, a bathroom, a lavatory, and a hospital ward, with fittings complete. This, as we have remarked in many similar instances, is the best possible method of exhibiting, as it shows the goods as they would appear in their actual application.

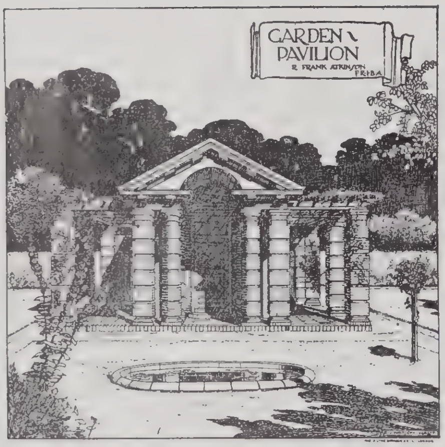
The special attention of architects interested in hospital construction is invited to the bent corner pieces, or inverts, which are excellent examples of glass bending, and admirably adapted to meet the requirements of modern sanitation. The company are making a special feature of this class of work in their present exhibition.

Attention is also called to the 4ft. 6in. section of tunnel tiling, this being a reproduction of work actually fixed, to the extent of over 10,000 super yards, in the Angel to Euston extension of the City and South London Railway. This tiling will be found, on inspection, to be as perfect as when completed two years ago.

A new feature in this exhibit is "Newoleum" flooring, which rivals—or possibly excels—any like article on the market. It is as durable and cheaper.

It is impossible to reproduce here a full list of the firm's many clients; but recent contracts include the War, India, and Home Offices; Office of Works; extension of G.P.O. at St. Martin's-le-Grand; the Borough Councils of Ilford, Leyton, and Stoke Newington; the S.W. Railway Co.; the South Metropolitan Gas Co.; etc., etc.

C. H. NORRIS, LTD., WHEATLEY CHAMBERS, PIER ROAD, ERITH. STAND 81. ROW E.



Following the precedent of 1907, Messrs. Norris have commissioned Mr. R. Frank Atkinson, F.R.I.B.A., to design their stand, and, like its predecessor, it will be remembered among the most noteworthy of the exhibits. Architects are not likely to dissociate Mr. Atkinson's Georgian pavilion from the bricks of which it is built, and from this point of view, if from no other, the enterprise of Messrs. Norris will prove a wise policy. The pavilion, or garden house, occupies a space of 25ft. by 20ft., and consists of one large square room, having a brick tiled floor and a domed plaster ceiling with cornice, all bearing that scholarly impress which characterises Mr. Atkinson's work The brick columned portico, with its copper roof, forms a very attractive approach.

The whole structure, in which Messrs. Norris's bricks have been employed, was erected in the remarkable time of 10 days by Messrs. Godson and Son, of Kilburn.

The following is a list of buildings (with their architects) in which this firm's bricks have been used:—Erith Technical Institute and Secondary School, W. Egerton, M.S.A.; Town Hall for Borough of Lambeth, Warwick and Hall, AA.R.I.A.B.; New Scotland Yard (additions to), J. Dixon Butler; house, Denbridge Road, Bickley, C. H. B. Quennell; Town Hall, Godalming, the Surveyor of Godalming; Cass Charity School, Mitre Street, Aldgate, A. W. Cooksey, A.R.I.B.A.; Haberdashers' (Aske's) School, Hampstead, Stock and Page, FF.R.I.B.A.; Elmstead Glade, Chiselhurst, Bromley Municipal Offices, 151-3, Great Portland Street, W., 11, Great Marlborough Street, W., and Laurie and McConnal's premises, Cambridge, R. Frank Atkinson, F.R.I.B.A.; Eastern Counties Convalescent Homes, Clacton, J. Douglas Mathews and Son; etc., etc.

NOSTELL BRICK AND TILE WORKS, NEAR WAKEFIELD. STAND 114. ROW G.

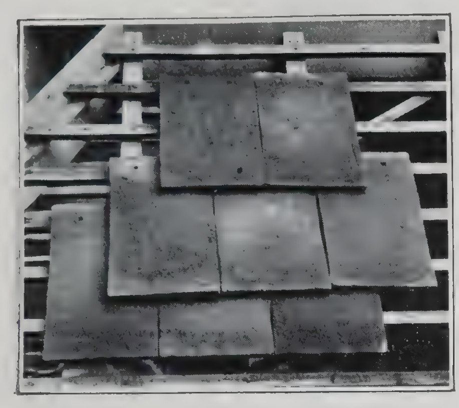
The Building Exhibition at Olympia is always peculiarly rich in displays of bricks and tiles; those elemental products of earth and fire in which this country is rich beyond all others.

The collections relating to the art and craft and business of the clayworker that are got together with such completeness time after time at the Building Exhibition, are always quite adequately representative of this great industry; and the present exhibition is by no means an exception to the rule. It does not in this respect, nor in any other, fall short of its predecessors.

There is an extraordinary diversity of interest in the plant and machinery, processes and products, of this section of the cycle of the building trades; and that such a display is highly valued, not only by those who are connected with the clayworking or the building industry, but by the outside public as well, may be inferred from the interesting fact that parties of school children have been taken to the Exhibition with the express object of watching the brickmaking machinery at work and of observing to what beautiful shapes the substance of the earth may be turned. Evidently, therefore, the clayworking exhibits may be regarded as highly educational.

This stand contains a collection that is representative of, and creditable to the best traditions of this honourable industry. The roofing tiles, plain and ornamental; the flooring tiles, adamant and tesselated; the terracotta, red, buff, grey, etc.; the glazed faience; and the red and blue bricks, make up a notable and highly attractive display of goods in which all denominations of builders are intensely interested, since they are fundamental to the business of building. They are a striking proof that burnt-earth building is in no great danger of becoming extinguished by the water-mixed or concrete method.

THOS. PASCALL AND SONS, HIGH STREET, SOUTH NORWOOD, S.E. STAND 116. ROW G.

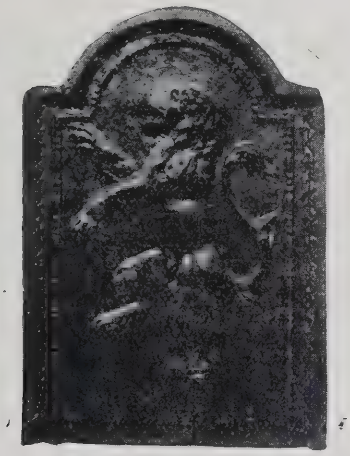


Messrs Pascall and Sons show a small building erected in their broken-colour bricks and roofed with different coloured Wrotham red and stained roofing tiles. The exhibit is worthy of special attention as an illustration of the varied colours obtained by using the bricks as they come from the kilns, instead of sorting them for uniformity of shade. It is another instance of the wisdom of following the old traditions of manufacture, and shows that it is possible to make hand-made bricks and tiles which are comparable with those in old buildings, without resorting to spurious methods of production.

At this stand may also be seen specimens of Messrs. Pascall and Sons' bonnet-shaped hip tiles (made on the lines of the old ones), with valley and ridge tiles in keeping with them, and a patent expanding ridge adjustable to any pitch or roof.

The following is a list of buildings (with their architects) in which Wrotham red bricks have been used:—St. Mary's church, Summerstown, Tooting, Godfrey Pinkerton; schools for Cooper's Company, Bow, E., T. P. Figgis; Catholic Church (South Wimbledon), Augustinian Convent (Westgate-on-Sea), schools (Sanderstead), F. A. Walters; numerous country houses, Ernest Newton; Co-operative Stores, "Woodlands," near Doncaster, Wesleyan Schools, "Woodlands," near Doncaster, P. B. Houfton; house at Bransgore (Hants), house at Spetisbury (Dorset), house at Christchurch (Hants), J. H. Brewerton; Ramsgate General Hospital, Messrs. Woodd and Ainslie; house, Las Arenas, Bilbao, Spain, Messrs. Chatterton and Couch; houses at Beckenham and Sevenoaks, Francis Hooper; Theological College, Cuddesdon, Oxon, C. Wontner Smith; "Eyhurst," Kingswood, Surrey, R. Morphew; country houses in Kent, Surrey, Sussex, Hampshire, Oxfordshire, Berkshire, and Jersey, Ernest Newton; new buildings, Hever Castle, F. L. Pearson, etc., etc.

MRS. M. L. POPHAM, JOHNBY BRICK, TILE AND POTTERY WORKS, SKELTON, PENRITH, CUMBERLAND. STAND 274. ROW T.



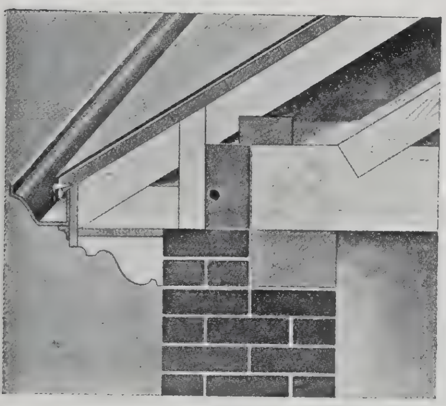
Among a variety of most artistic and interesting articles of pottery ware exhibited at this stand is a novelty in fire backs. This is made of fireclay, and in shape follows the usual cast-iron form, though there are others which do not. The heraldic lion with which this particular example is ornamented is modelled with just enough relief and breadth for the purpose it has to fulfil and fine detail which is inappropriate in such an article—has been very properly avoided.

The remainder of the exhibit consists of ornamental pots, jardinieres, bas-reliefs, etc. —adapted from old Italian and other designs. Particular note should be made of a sun-dial which was modelled—so far as the upper part is concerned—from an Arabian capital. A square pot, with low-relief panels, showing clever adaptations of Byzantine ornament, is also worthy of attention.

The manufacture of these articles only commenced a few months ago, when the brick and tile works were acquired by the present owner—a lady—whose enterprise entitles her to a wide recognition.

It is surely an industry in which a lady may reasonably hope to excel. Ladies have long distinguished themselves in the various arts and crafts; and by its plasticity the material would seem to lend itself willingly to their gentle and deft control. In all the schools of modelling to which they have been admitted, they have achieved high distinction for both industry and skill; and it is well known that much of the artistic pottery that has acquired a reputation owes the beauty of its modelling or of its decoration to the ladies who are among the most important members of the artistic staff. It is not surprising, therefore, to find a lady at the head of such an establishment as this.

THE RUBEROID CO., LTD., 81-83, KNIGHTRIDER STREET, LONDON. E.C. STAND 101. ROW F.



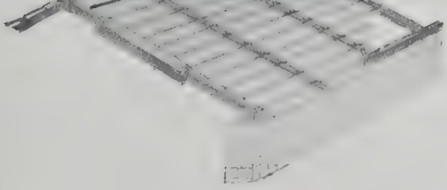
This stand consists of a pavilion with roofs of various pitches, and such constructive features as dormers, box gutters, hips, valleys, etc., in which the adaptability of Ruberoid for all ordinary roofing purposes is demonstrated. Inside the pavilion may be seen various models illustrating the application of Ruberoid as a covering for concrete roofs, wood flats, pitched roofs, and flashings to chimney stacks and wood skylights. Ruberoid was the first prepared permanent roofing material to be placed on the market, and in its composition there is no paper, tar, asphalt, rubber, or any ingredients likely to oxidize or perish; and it is elastic, light, non-porous, and is unaffected by the action of weather, or the fumes of acids or alkalies.

Three brick panels representing sections of a wall illustrate the Ruberoid system of damp-proofing walls, and as they are actual tests they should be particularly noticed by architects.

Ruberoid is made in two colours—red and green—in addition to the standard roofing, which is grey.

The following is a list of buildings (with their architects) in which Ruberoid has been used: City Chambers, Leeds, Perkins and Bulmer; Briton Ferry Chemical Works, S. Wales, J. Money Kent, A.M.I.C.E.; Children's Hospital, Gateshead, Watson and Scott; Main Hall, Royal London University, H.M. Office of Works; Goods Warehouse for the North-Eastern Railway Co., Newcastle-on-Tyne, William Bell, F.R.I.B.A.; premises for Messrs. Tom Norton, Llandrindod Wells, R. Wellings Thomas, F.R.I.B.A.; Liscard Battery, Cheshire, H.M. War Office; works for Messrs. Hayward and Co., Crewkerne, C. Benson, M.S.A.; bungalow at Shoreham, Percival T. Harrison, A.M.I.C.E.; pavilion, Greenwich Park, H.M. Office of Works; Archbishop Holgate's School, York, W. H. Brierley, F.R.I.B.A.

T. SANKEY AND SONS, LTD., ALBERT STREET WORKS, BILSTON. STAND 115. ROW G.



This exhibit illustrates in a very practical way the general utility and adaptability to every-day needs of the "Universal" roofing sheets and building material. Much has been done in the past with ordinary corrugated iron sheets, but those now under consideration, the invention of Mr. Taylor, combine so many entirely novel features and improvements, both as regards appearance and soundness of construction that they may be confidently recommended to the notice of those interested in temporary buildings. The sheets are not unlike weather boarding in appearance, presenting horizontal lines where they are stepped, at intervals of 4½ inches. A small office or garden shelter has been erected at this stand in order to illustrate the method of applying the sheets to the roof and walls. The inside is lined with this firm's embossed metal plates.

The illustration gives an idea of the appearance of the roofing.

The following is a list of buildings in which Messrs. Sankey and Sons' patent universal roofing sheets have been used:—Borstal Prison, H.M. Home Office; Cheltenham Station, G.W. Railway Co.; Snow Hill New Station, Birmingham, G.W. Railway; Tyseley Carriage Sheds, G.W. Railway Co.; Colwall Station parcels office, G.W. Rly. Co.; Newbury Westfield, station waiting-room; Oxford, Station Stores; Heysham Harbour, M. Railway Co.; Matlock Bath Station, M. Railway Co.; Hellefield Station, M. Railway Co.; goods warehouse, Shipley M. Railway Co.; engine drivers' barracks, Masboro', M. Railway Co.; verandah, Sleaford; Morecombe Station, M. Railway Co.; potato stores, West Kensington, M. Railway Co.; bungalow, Lambourne, etc., etc.

THE SEYSSEL AND METALLIC LAVA ASPHALTE CO., 42, POULTRY, LONDON, E.C. GROUND FLOOR—STAND 16 ROW A. GALLERY FLOOR—STAND 1. ROW B.

On the ground floor are to be seen models of the L.C.C. Generating Station, Greenwich—where the company laid their asphalte; a motor garage, illustrating horizontal and vertical damp courses; a tank showing asphalte lining and filletted angles, and others of brickwork construction, where vertical damp courses and metallic lawn grouting are applied.

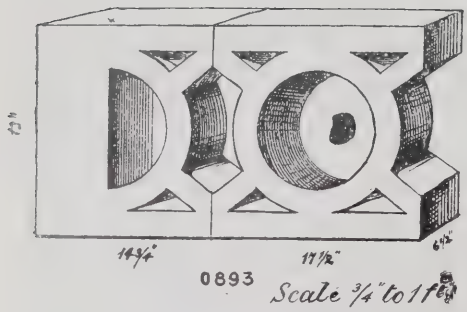
There are also several roof models showing respectively Seyssel asphalte (1in. thick) in two coats, on concrete; with canvas, on boarding; and a short length of valley gutter.

A piece of concrete roof resting on a 14in. wall and having a 9in. parapet forms a practical demonstration of the proper method of cutting the chase for the skirting. At the eaves the floating is shown set back as a rebate for the lead flashing.

In the gallery (Stand No. 1, Row B, Municipal Surveyors' Section) are shown various samples of asphalte laid on cement concrete.

The Seyssel Asphalte Co.'s contracts include work at the following:—L.C.C. Generating Station, Greenwich; London Hydraulic Power Co., Westminster; Blackfriars Bridge widening; Immingham Docks, Grimsby; Co-operative Wholesale Society, Ltd. warehouses, Leman Street and Silvertown; Albemarle Club, Dover Street, W.; Hertford College, Oxford; King's College, Cambridge; schools, Pelham Road, Wimbledon; schools, Ashford, Middlesex; John Ruskin schools, Beresford Street, S.E.; Godolphin and Latymer Schools, Hammersmith; schools, Sawbridgeworth; schools, Denby, Derbyshire; public library, Walthamstow; underground convenience, Christchurch Road, Streatham, S.W.; flats, De Walden Court, Great Portland Street, W.; "Wyphurst," Cranleigh, Surrey; "Moreton Hall," Warwickshire; flour mills, Hull; church, Brighton; electricity station, Hove.

STANLEY BROS, LTD., NUNEATON. STAND 73. ROW D.



Messrs. Stanley Bros. are giving special prominence at this stand to their glazed goods, which include bricks, terra-cotta blocks, vases, and sinks, in a variety of colours, such as white, ivory white, cream, golden brown, oak brown, light green, dark green, meadow green, holly green, mistletoe green, etc.

In order to display the colours to the best advantage, the stand is built up in tiers of fullnose bricks, each receding 2¼in., the whole supported on a base of large glazed terra-cotta blocks (known as "Grey Granite") picked out at the angles with "Golden Brown" blocks. A few glazed terra-cotta vases and sinks are also shown. Among the latter should be noted the firm's recently introduced "New Cane" shade of colour.

Messrs. Stanley Bros.' glazed bricks have been used in the following buildings:—

Schools. — London (various), Birmingham (various), Northampton, Leicester, Walsall, Derby, Nuneaton, Cambridge, Hereford, Erith, Canterbury, Coventry, Worthing, Redhill, Watford, Hitchin, Norwich, Faversham, a number of schools for Middlesex Education Committee and Gloucestershire Education Committee, etc., etc.

Theatres.—Waldorf, London; Criterion, London; The King's Hammersmith; Gaiety, London; East Ham Palace, etc.

Miscellaneous.—Digbeth Institute, Birmingham; Corn Exchange, Coventry; Masonic Hall, Chatham; extension of Merton College, Oxford; Folkestone Town Hall; Queen Anne's Chambers, Wesminster; L.C.C. Dwellings, Battersea; Harcourt House, Cavendish Square, W.C.; Moffatt Institute, Kennington; Lister Institute, Chelsea Bridge Road, S.W.

WM. THOMAS AND CO., LTD., WELLINGTON, SOMERSET. STAND 119. ROW D.

This company exhibit a complete structure, which has been designed to afford opportunities for the display of facing bricks, moulded bricks, and roofing tiles (both smooth and sandfaced). In addition, there are also numerous samples of engineering bricks, paving bricks, ridge tiles, finials, drain pipes, etc.

In regard to this firm's bricks, it may be mentioned that they are all of plastic manufacture, which imparts to them a maximum crushing strength. For this reason these bricks have been largely used by engineers during the last fifty years for such work as railways, bridges, viaducts, tunnels, sewers, barracks, reservoirs, etc. In the process of manufacture the colours are produced without the assistance of artificial colouring matter or dips of any kind, and in consequence they permeate the whole brick.

Among Messrs. Thomas and Co.'s specialities the particular attention of architects is called to the exhibit of green glazed roofing tiles.

The various works at which this firm's goods have been used would make a very long list. The following is a very small selection:—Bodmin and Dorchester prisons; County Asylum, Bodmin; Police stations at Torquay, Newton Abbot, etc. Railway construction: G.W.R., new direct route to London, via Langport and Castle Cary (several millions of bricks); Fullerton to Hurstbourne, L. and S.W.R., and on several important sections of the Great Western and other railways. Sewage works at Torquay, Teignmouth, Exeter, and many other places; waterworks, reservoirs, pumping stations, etc., at Barnstaple, Torquay, Taunton, and elsewhere. Numerous public works for local authorities such as the town councils of Brighton, Taunton, Chard, Weston-super-Mare, Teignmouth, Torquay, Newton Abbot, etc., etc.

TOWERS' ADAMANTINE CLINKER, FIRE AND ROOFING TILE CO., (A. W. SQUIRES), LITTLE BYTHAM, NEAR GRANTHAM. STAND 118. ROW G.

England is peculiarly rich in non-metallic minerals, and their manufacture into articles of utility is certainly one of our leading industries, and is perhaps the one above all others in which there is the least to dread from foreign competition. Scarcely any coal-producing district is without material of this kind; and it exists not only in great abundance, but of excellent quality, and is obtained at small cost, as a sort of by-product during the working of the coal. Nature has taken care to provide England with all the materials necessary for the potter's art. Clay, flint, kaolin, felspar, exist here in abundance, and to fire these we have mineral fuel sufficient to last for centuries, if only we are careful to exercise economy in the output.

The intimate association of clay and fire in an industrial co-partnership is strongly suggested by the exhibits on this stand.

Here are, for instance, "Adamantine" clinkers, paving bricks, and channels; fire-bricks and fire-tiles, as well as roofing tiles. The clinkers and the roofing tiles are no doubt destined to become more intimately associated with fluids than with fire, and their appearance inspires the fullest confidence in their ability to withstand the ordeal by water as successfully as the other exhibits will undergo the ordeal by fire.

The paving of stables, lairages, coach-houses, slaughter-houses, etc., etc. formerly a matter that received but little attention from the architect, is now generally specified with minute care, in order to secure results that shall not only meet the most stringent requirements of sanitary authorities but that shall also be seemly to the eye and convenient in the use. Fire-bricks are also of much wider application than heretofore; and, on the whole, this stand, although the exhibits are of a purely utilitarian order, will assuredly receive a large share of attention at an Exhibition which, while rich in art objects, is primarily concerned with business.

VULCANITE, LTD., 118, CANNON STREET, LONDON, E.C. STAND 42. ROW B.

A ROOF GARDEN. VULCANITE ROOFING UNDER.

The large wooden stand which this company has erected is covered with Patent Vulcanite Roofing, and shows the application of this well-known material to roofs of wooden construction. Access to the roof is provided by means of a spiral staircase.

On the floor level is exhibited a model illustrating in detail the method of laying. From this it will be seen to consist of six successive layers of sheet asphalte and vulcanite, alternately applied, the finished surface depending on circumstances.

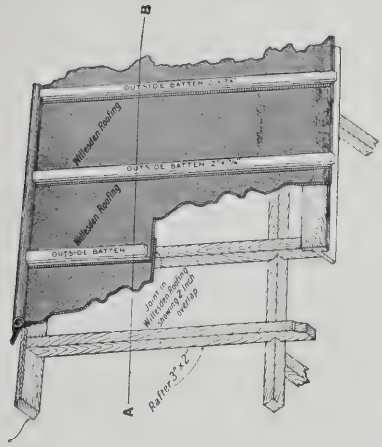
One of the most interesting uses to which this material has been put is the construction of roof tanks or reservoirs. A small pond, of wooden construction, outside the exhibit shows that it is perfectly water-tight.

"Rexilite" pure bitumen sheeting is recommended for damp courses and sloping roofs of light construction.

"Vulcanite" can also be used for damp courses.

"Vulcanite" has been used for roofing the following, among many other, buildings:—Two large bottling stores for Messrs. Read Brothers, Ltd., Highgate Road, Kentish Town, London, N.W.; gymnasium at the Convent of the Sacred Heart, Roehampton, London, S.W.; Granville Hotel, Sackville Street, Dublin; roof tank, Wood Green; the Empire Theatre of Varieties, Oldham; Greenacre Mill, Oldham; Messrs. Asa Lee and Co.'s new foundry, Oldham; The Nile Mill, Oldham; the Pier Hill Scheme Buildings, Southend-on-Sea; Victoria Hotel, Southend-on-Sea; new Capital and Counties Bank Buildings, Southend-on-Sea; the new Queen's Hotel, Westcliff-on-Sea; the North Euston Hotel, Fleetwood; seventeen roofs and large water tank on new Mater Infirmorum Hospital, Belfast, etc., etc.

THE WILLESDEN PAPER AND CANVAS WORKS, LTD., WILLESDEN JUNCTION, LONDON, N.W. STAND 45. ROW C.



At the sides of this stand, panels showing the underlining and roofing paper, of which this Company makes a speciality, are exhibited. Facing these are others displaying roofing canvas, etc.

There is also on view a set of very interesting models illustrating the application of underlining to roofs, both on rafters and on boarding. The Willesden underlining paper is no longer a novelty, and will be familiar to most architects.

It is made from the best material obtainable, and subjected to a process which impregnates it with a copper filling treated with ammonia, which virtually changes the paper into thin sheets of metal, and imparts to it waterproof and rot-proof qualities.

Attention is directed to another series of models exhibited at this stand. These are of tents of various type—one in particular having a caravan extension.

The following is a list of buildings (with their architects) where this Company's specialities have been used:—Hydro Hotel, Eastbourne, F. G. Cooke; Fenton Free Library, Staffs., F. B. Lawson; laundry and motor garage, Llandudno, G. A. Humphreys, F.R.I.B.A.; gas offices, Bristol, Venn Gough; new Wesleyan Chapel, Albert Road, Penarth, H. G. Bodgen; Grammar School, Hull, J. Hirst; St. Ninian's parish church, Stirling, Messrs. Walker M'Luckie; Sandford Paper Mills, near Oxford, J. R. Wilkin; new school, St. Annes-on-Sea, W. Scott; Dr. Coulter, Highfield Hall, St. Albans, F. W. Kenner Tarte; new infants' school, Walkergate, Beverley, Messrs. Howe and Foley; Warwick Girls' Reformatory, Knowle Hill, Kenilworth, M. C. Armstrong; private house, Ferndown, Wimborne, T. Stevens; new rectory, Buckland St. Mary, Somerset, A. C. Martin; Rt. Hon. Lord Llangattoch's Estate, Sir Aston Webb; etc., etc.

G. WOOLLISCROFT AND SON, LTD., HANLEY, STAFFS.

STAND 219. ROW N.

Constructional faience, terra-cotta, red and blue goods, and tiles of every description are represented at this stand, in the construction of which a varied assortment is displayed.

To the left of the entrance doorway is a scheme of faience decoration in carrara glazes; the entrance being of constructional faience. In the passage that divides the stand is a collection of modern fireplaces, including those known as the Glow, Quadrate, and Downdraught, which lend themselves to many styles of artistic treatment.

On the floors are specimens of tesselated and ironstone adamantine tiles in a choice assortment of designs.

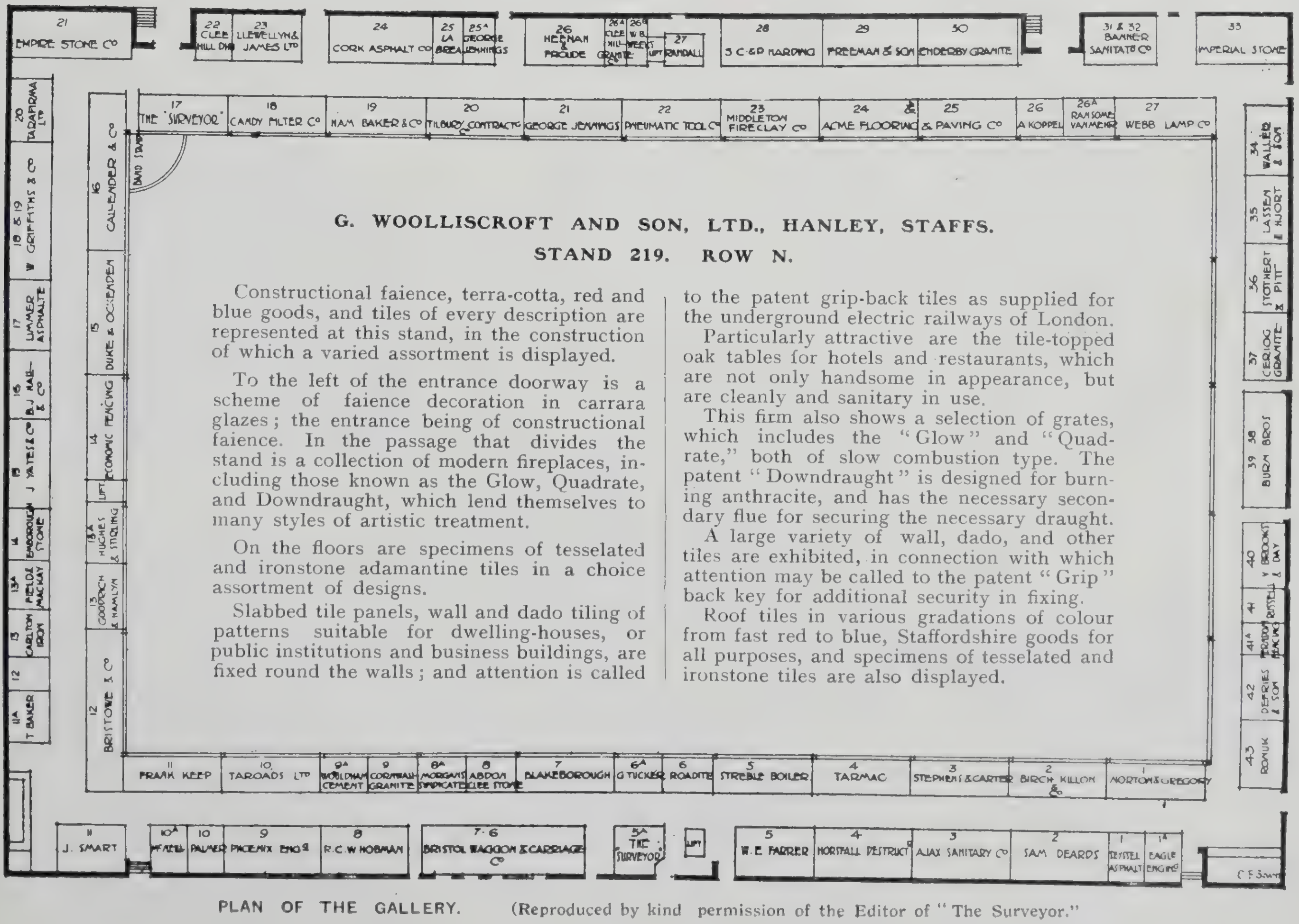
Slabbed tile panels, wall and dado tiling of patterns suitable for dwelling-houses, or public institutions and business buildings, are fixed round the walls; and attention is called to the patent grip-back tiles as supplied for the underground electric railways of London.

Particularly attractive are the tile-topped oak tables for hotels and restaurants, which are not only handsome in appearance, but are cleanly and sanitary in use.

This firm also shows a selection of grates, which includes the "Glow" and "Quadrate," both of slow combustion type. The patent "Downdraught" is designed for burning anthracite, and has the necessary secondary flue for securing the necessary draught.

A large variety of wall, dado, and other tiles are exhibited, in connection with which attention may be called to the patent "Grip" back key for additional security in fixing.

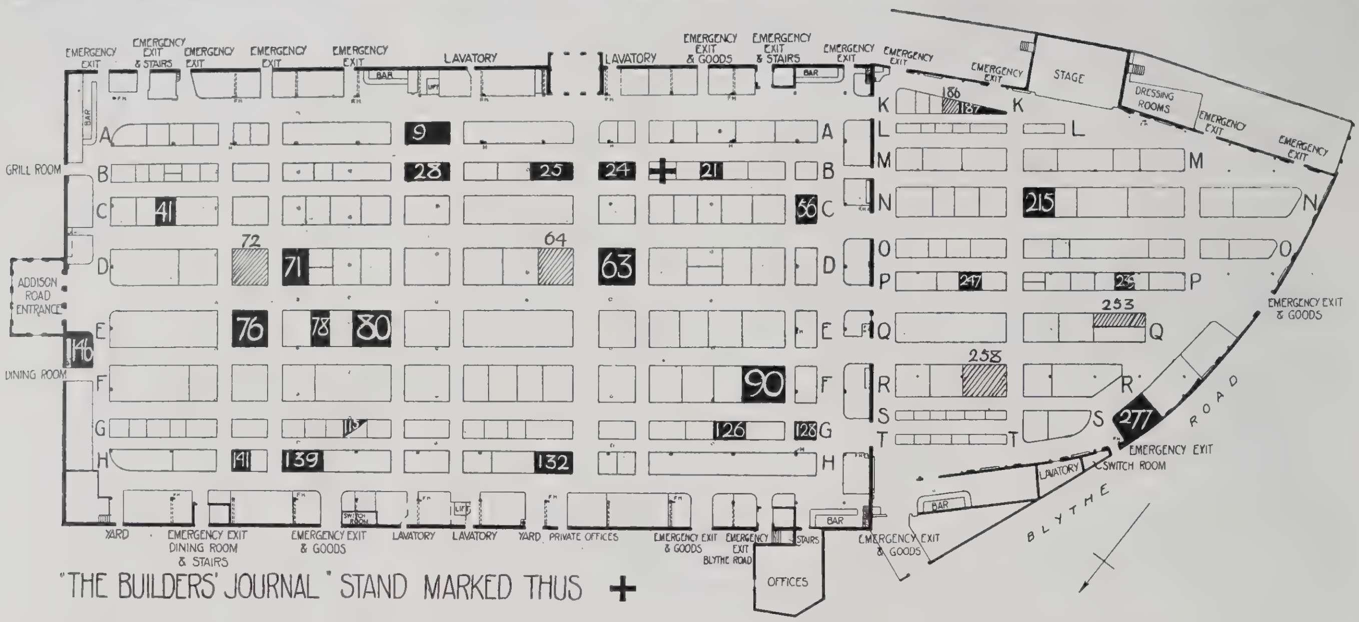
Roof tiles in various gradations of colour from fast red to blue, Staffordshire goods for all purposes, and specimens of tesselated and ironstone tiles are also displayed.



PLAN OF THE GALLERY. (Reproduced by kind permission of the Editor of "The Surveyor."

SECTION FOUR.

Cement. Plaster. Concrete. Reinforced Concrete. Reinforcements. Fire-Resisting Construction.



following firms are noticed under this section, and their stands are shown blacked in, with numbers in white :—

41	C	Armoured Tubular Flooring Co., Ltd., p. 368.
63	D	Associated Portland Cement Manufacturers (1900), Ltd., p. 369.
128	G	Acton Patent Concrete Partition Co. (1909), Ltd., p. 369.
215	N	British Uralite Co. (1900), Ltd., p. 369.
126	G	Bellman, Ivey and Carter, Ltd., p. 369.
21	B	Clark and Co., p. 370.
239	P	Coignet, Edmond, Ltd., p. 370.
132	H	Cullum, Horace W., and Co., p. 370.
139	H	Daymond, John, and Son, p. 370.
76	E	Expanded Metal Co., Ltd. (The), p 371.
146	Wa Space	Fawcett, Mark, and Co., p. 371.
25	B	Granite Silicon Plaster Co., Ltd., p. 371.
277	Wall Space Annexe	Gypsum Mines, Ltd., p. 371.
247	P	Gardel, Ltd., p. 372.
78	E	Jones, Fredk., and Co., p. 372.
71	D	King, J. A., and Co., p. 372.
56	C	Lewis Construction Co., Ltd., p. 372.
9	A	Machin and Koenig and Speaker, G.R. & Co., p. 37
24	B	Patent Indented Steel Bar Co., Ltd., p. 373.
141	H	Somerville, D. G., and Co., p. 373.
187	K	Saxon Portland Cement Co., Ltd., p. 373.
115	G	Sideolith, p. 374.
28	B	Tozer, James H., and Son, p. 374.
80	E	Trussed Concrete Steel Co., Ltd., p. 374.
9A Bay	(Gallery)	Wouldham Cement Co., Ltd., p. 374.

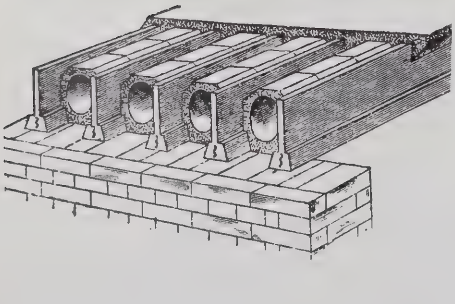
REFERENCES.

The following firms are noticed in other sections, but are showing exhibits connected with this one. Their stands are indicated by hatching :—

186	K	Atlas Stone Co., Ltd., (The), p. 358.
72	D	Emdeca Sanitary and Artistic Metal Decoration Co., Ltd., (Steleonite Stamped Steel Ceilings).
253	Q	Fireproof Partition and Spandrel Wall Co., Ltd., (Brickwork Reinforcement), p. 360.
258	R	Johnson, Richard Clapham and Morris, Ltd., (Brickwork Reinforcement), p. 361.
64	D	Kleine Patent Fire-resisting Flooring Syndicate, Ltd., (Fire Resisting Floors), p. 362.

THE ARMOURED TUBULAR FLOORING CO., LTD., 53, VICTORIA STREET, WESTMINSTER, LONDON, S.W.

STAND 41. ROW C.



This Company exhibit a strip of reinforced concrete fire-proof flooring constructed without centreing, on their armoured tubular system. The floor consists of concrete webs fixed 10in. centres (each reinforced at its haunched base with a corrugated steel bar) and concrete tubes in short lengths, supported between them. The whole structure is then finished with a thin layer of concrete. In the specimen on view, an opening has been left to illustrate the method used in trimming for stairs, lifts, skylights, etc., and the upper side of the floor shows some of the various finishes which may be applied. The soffit has been partly plastered, and gas pipes and electric wires have been run through the hollow tubes to demonstrate the facilities afforded. The various parts necessary for the construction of this floor are separately shown, and include standard sizes of webs, the concrete tubes, and the steel reinforcement bars.

The following is a list of buildings (with their architects) where the Company's system of floor construction has been adopted: Secondary schools, Sowerby Bridge, Yorks, architects, Longbottom and Culpan; St. Luke's School, Chelsea, London, architect, W. H. Hobday, A.R.I.B.A.; Forster Green Hospital for Consumptives, Belfast, architect, V. Craig, F.R.B.A.; Grammar Schools, Yorks; Albert Foundry, Belfast, for James Mackie and Son; boot factory, Bromsgrove, Worcester, architect, Alex. Anderson, A.R.I.B.A.; White Steam Car Co.'s Motor 'Bus Factory, Camden Town, architect, L. V. Hunt, F.R.I.B.A.; Humber Motor and Cycle Works, Coventry, architect, W. H. Hattrell; Whiteabbey Flax Spinning Mills, Belfast; shops, Middleton, Manchester, architects, Edgar Wood and Sellars; Church Institute, Wrexham, Cheshire, architects, Prothero, Philpott, and Barnard; etc., etc.

THE ASSOCIATED PORTLAND CEMENT MANUFACTURERS (1900), LTD., PORTLAND HOUSE, LLOYD'S AVENUE LONDON, E.C STAND 63. ROW D.

Visitors may learn a good deal at this stand of the manufacture, testing, and uses of Portland cement, and examine the very representative specimens of the upper chalk formation and clays obtained from the estuary of the River Medway, and from the Company's own deposits in Kent. Samples of slurry—the raw materials mechanically mixed in definite proportions—and a large selection of briquettes of various ages, to be tested for tensile strength during the exhibition, are also shown.

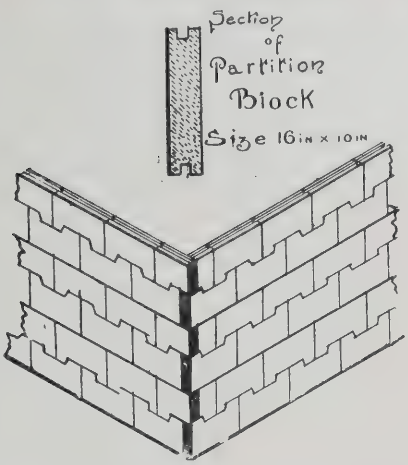
Crushing tests of $2\frac{3}{4}$ in. cubes of neat Portland cement, and a mixture of 3 of standard sand to 1 of Portland cement, and aggregates of various descriptions will also be made by those in charge of the stand.

A very fully illustrated handbook entitled "Everyday Uses of Portland Cement," which will be found of use to architects, is on sale, and some photographs of constructional works where the Company's brands of cement have been used are hung on the walls.

This volume must by no means be classed with the merely advertising "literature" which naturally abounds at an exhibition. It is a really valuable and instructive manual.

The following are some recent works in which A.P.C.M. brands of Portland cement have been used:—Belfast graving dock, Swansea new docks, Southampton dock, Methil docks, Avonmouth docks, Stalybridge docks, Garston; Bradford waterworks, Pateley Bridge; Monterey (Mexico) waterworks, Mexico City waterworks, Derwent Valley water board works, Molesey reservoir, new G.P.O. buildings, Birmingham new post office, Birmingham extension to Council House, Selfridge's Stores, British Aluminium Company's Works, Kinlochleven; new Wesleyan Hall, Westminster; new King's College hospital, Norwood carsheds, G.N.R. new sheds, Doncaster; etc., etc.

ACTON PATENT CONCRETE PARTITION CO. (1909), LTD., 63, CORNHILL, E.C. STAND 128. ROW G.



The unit of the Acton patent concrete partition is a Portland cement concrete slab, grooved for jointing. Slabs of 2ins., 2½ins., 3ins., and 4ins. in thickness are kept in stock, and these can be easily and rapidly erected into partitions of any required height and length, at a cost fairly comparable with that of ordinary plaster partitions. The advantages of the Acton patent partition, however, as compared with plaster work, are instantly manifest, the former being infinitely more strong and durable, incomparably more fire-resisting, and very much easier to erect. Besides the joint formed by ordinary cement mortar in the groove, a locking joint is ensured at every second course, the slabs being so shaped as to give a projection and recess joint that renders the partition sound, solid, and rigid.

The partition is sound-proof as well as fire-resisting, and their natural surface affords a good key for plastering, tiling, or mosaic work; and as nails can be driven into the slabs, no plugging is required.

Specimens of the Acton fireproof, sanitary, jointless flooring are also shown.

The firm's materials have been used to the order of H.M. Government for barracks at Gibraltar, Aldershot, Woolwich, Chelsea, Wellington, Knightsbridge, Bulford, Tidworth, Colchester, Chatham, Hamilton, Weedon, etc.; for hutments at Borden, etc. They have been used in many hospitals, including the Queen Alexandra Hospital, Aldershot, Shorncliffe, Netley, Woolwich, etc.; H.R.H. Princess Christian Victor's Nursing Home, Windsor, etc.; and at Guy's, Bristol (Oatley and Lawrence); in the Peabody Trust Dwellings, Herne Hill, Tottenham; in flats at Kensington (Silver Street); Camberwell (Woodroffe), etc.; in city offices at Friar's House, New Broad Street, and Portland House, Lloyd's Avenue (Hesketh and Stokes), etc.

THE BRITISH URALITE CO. (1908), LTD. LONDON OFFICE, 16, ST. HELEN'S PLACE, E.C. WORKS, HIGHAM, NEAR ROCHESTER, KENT. STAND 215. ROW N (ANNEXE).

The British "Uralite" Co. exhibits a building (20ft. by 16ft.) in imitation of half-timbered work, the contrasts being obtained by narrow strips of "Asbestone" fixed at intervals on the surface of the flat "Asbestone" sheets forming the walls. It is intended to show the adaptability of the company's manufactures to the construction of bungalows, cottages, etc.

For buildings of this type that are situated in remote districts, "Uralite" and "Asbestone" offer many important advantages, particularly with regard to portability, ease of construction, and fire-resistance.

The walls are of wood framing covered with "Asbestone" sheets (6ft. by 3ft.). One portion is left with a plain flat surface inside, and the other is panelled out with mouldings. The ceilings are of "Uralite" sheets, fixed in one case directly beneath the ceiling joists, and in the other just above them. The roof is of "Asbestone" diagonal tiles on battens, except the dormer, which is covered with "Asbestone" slates.

Asbestone and Uralite have been fully described in this journal, and readers will be glad of this opportunity of verifying by personal inspection what has been stated with respect to these materials.

"Uralite" sheets are being used in the following buildings and works: New Naval Base, Rosyth, for the Admiralty; Covent Garden Theatre, for E. O. Sachs (architect); Central Argentine Railway; Goole Tillage Company; for a factory in Yorkshire; for a mill at Port Ellesmere; Bombay, Baroda Railway; for a flour mill at Seacombe, Cheshire; for a motor garage in Egypt; for Grimsby Infirmary; lining a malt kiln at Ipswich; Great Western Railway, for Customs House at Fishguard; South Eastern Railway, for station work; ceiling a laundry in the North of London.

BELLMAN, IVEY AND CARTER, LTD., LINHOPE STREET, DORSET SQUARE, LONDON, N.W. STAND 126. ROW G.

A pair of Sienna columns, supporting an entablature, which were shown at the International Exhibition of 1862, where they gained a prize medal; and four large slabs which were at the Great International Exhibition of 1851, have more than the interest of mere relics or curios. They show in the most convincing manner possible the durability of the material of which they are made, and its lasting colour and polish, after the lapse of forty-seven and fifty-eight years respectively.

This material is Scagliola marble. Scagliola represents an old Italian process, which, revived in the sixteenth century by Guido Sassi, was largely used by the Florentines in some of their best works, and was introduced into this country about 1750 by Mr. J. Wyatt. It can be applied to all kinds of interior decoration where marble would be used, and can be turned, moulded, or cast to any shape or design. It is particularly useful for masking iron or brick cores. About sixty varieties of beautiful marbles are imitated, and further colours and figures can be produced on demand, at one-third to half the price of the marble.

The following are a very few of the mansions at which the firm has executed Scagliola work. (For the almost innumerable important buildings of other descriptions, we must refer the reader to the firm's pamphlet). The name in parentheses is that of the architect:—Albert Gate Mansions, S.W. (A. Ardron); Bantry House, Bantry Bay (for the Earl of Bantry); Bridgewater House (J. Fish); Castle, Mallwood (Paxton H. Watson); Enville Hall, Stourbridge (for the Earl of Stamford and Warrington) (the late T. Smith); Lansdowne House, Berkeley Square (for the Marquess of Lansdowne) (C. O. Parnell); Lampton Castle, Durham (for the Earl of Durham); etc. etc.

CLARK AND CO., 32a, WESTMINSTER PALACE GARDENS, ARTILLERY ROW, WESTMINSTER, LONDON, S.W. STAND 21. ROW B.

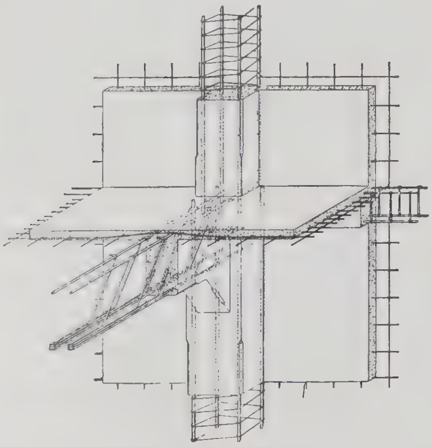
"Xelite" plaster is here exhibited in a stand erected from the designs of Mr. James Scott, A.R.I.B.A., where its general appearance and surface qualities may be studied with advantage.

It is a substitute for Keene's, or Parian, cement (at very much less cost), though having slower setting qualities. "Xelite" may be used for both rendering and finishing, and has been largely employed on various classes of buildings, such as hospitals, schools, libraries, etc.

The exhibition stand is constructed of Messrs. Clark's 3 in. finished fire-resisting partitions, of which this firm makes a speciality.

The following is a list of some of the buildings (with their architects) for which "Xelite" plaster has been used: Offices for Messrs. Blundell Spence and Co., Hull, B. S. Jacobs, F.R.I.B.A.; offices, Mayfair, Belfast, Blackwood and Jury, M.R.I.A.I.; post office, West Smithfield, H.M. Office of Works; warehouse, Belfast, W. J. Gilliland, M.R.I.B.A.; offices, Lowgate, Hull, B. S. Jacobs, F.R.I.B.A.; Shire Hall, Norwich, E. J. Tench, A.R.I.B.A.; East Riding County Council Offices, Beverley, B. S. Jacobs, F.R.I.B.A.; Chamber of Commerce, Hull, B. S. Jacobs, F.R.I.B.A.; Knightsbridge Barracks, H.M. War Department; Windsor Barracks, H.M. War Department; Richmond Barracks, Yorks, H.M. War Department; Public Library (West End) Reading, F. W. Albury, F.R.I.B.A.; Saville Street Cafe, Hull, Runton and Barry, A.R.I.B.A.; Church of the Christian Martyrs, Manchester, F. H. Oldham, F.R.I.B.A.; Wesleyan Institute and Schools, Hartlepool, Barnes and Burton, A.R.I.B.A.; F. R. Benson and Co.'s Bank, London, W. E. Clifton, F.R.I.B.A.; West Smithfield Post Office, etc., etc.

EDMOND COIGNET, LTD., 20, VICTORIA STREET, LONDON, S.W. STAND 239. ROW F.

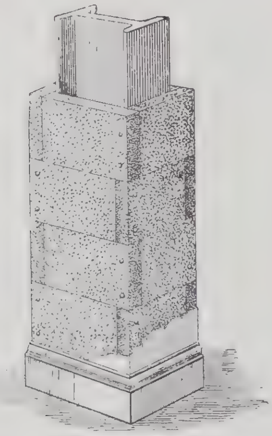


There are several very interesting models at this stand, which show the various features of the armouring employed in the Coignet system. One of these illustrates the construction of posts, beams, floors, and wall panels, and will well repay examination. Other models represent the Coignet trussed beam (used for heavy vibratory loads), an ordinary beam, and a post with footing attached. Perhaps the most interesting model is that of the Coignet pile, a part of which has been purposely stripped of concrete to show the end of the reinforcement.

On the walls of the stand are hung some photographs, among them being a general view of the Government buildings in Jamaica, which are being carried out on the Coignet system. There are also several good photographs of the new Western District Post Office in Wimpole Street, W., and the new generating station foundations at Dundee.

The following is a list of recent works in course of erection since publication of the catalogue:—New Government Buildings, Jamaica, Nicholson and Corlette, architects; Post Office, Lombard Street, H.M. Office of Works, Sir H. Tanner, architect; boiler foundations, H.M. India Office; wharf, Portslade, Sussex; jetty in the Camber, Portland, H.M. Admiralty; piling at Norwich, A. E. Collins, city engineer; tank for Paper Pulp Co., West Hartlepool; floors and swimming bath to Yeadon and Guiseley Schools, York, Mr. Broadbent, architect; floors to shops, etc., West Bar, Boar Lane, Leeds, Perkin and Bulmer, architects; floor to Blakey's premises, Leeds; footbridge and Coal Store, Erith, Scott and Fraser, architects; additions to warehouse and business premises, 24, Paternoster Square, H. Saul, A.R.I.B.A., architect; Soap Works at Chiswick, Scot and Fraser, architects; etc.

HORACE W. CULLUM AND CO., CRAVEN HOUSE, KINGSWAY, HIGH HOLBORN, LONDON, W.C. STAND 132. ROW H.



STANCHION COVERING.

The "Kulm" patent fireproof partition slabs—a speciality of this firm—are exhibited at this stand in illustration of their application to ordinary constructive work. In composition they differ somewhat materially from the many varieties of partition slabs on the market in that instead of being of plaster, they are of pumice concrete and Portland cement. To their concrete nature may be attributed their heat-resisting power, which has been proved to be considerable as a result of severe tests by the British Fire Prevention Committee. They afford good fixing for woodwork, which can be nailed directly to them without the necessity for plugging, and their surface provides an efficient key for plaster or cement finish. The illustration shows their adaptability to stanchion casing, which is one of the uses for which they are particularly suitable. They have been employed to a considerable extent in the external work of bungalows, etc., where rigidity and rapidity of construction are necessary.

The following is a list of buildings (with their architects) in which "Kulm" slabs have been adopted: Gloucester House Flats, Piccadilly, W., Collcutt and Hamp; Harcourt House Flats, Cavendish Square, W., Gilbert and Constanduros; Thorney Court Flats, Palace Gate, W., Millard and Pryce; Portland Court, Great Portland Street, W., Durward Brown; British Medical Association's new premises, Strand, W.C., H. Percy Adams; Hamburg-American Line Offices, Cockspur Street, S.W., Stock and Page; extensive premises at Bristol for the Imperial Tobacco Co., Ltd., F. W. Wills, Bristol; Anglo-American Bank and Offices, Old Broad Street, E.C., and King's House, King Street, E.C., M. E. Collins; large block of shops and offices, 417-422, Strand, W.C., G. R. Crickmay and Sons; etc. etc.

JOHN DAYMOND AND SON, EDWARD STREET, WESTMINSTER, LONDON, S.W. STAND 139. ROW H.

It will interest architects to see at close quarters the full-size models from which the capitals on the main facades of the new Local Government Offices in Whitehall were executed. These, and models for carved capitals at the Tate Gallery extension are exhibited at this stand.

Messrs. Daymond also show specimens of hard wood carving and joinery, including portions of an organ case, a font, etc.

Modelling in "Stuc" for interior and exterior work forms another feature at this stand, where practical demonstrations will be given by one of the firm's craftsmen, who will be at work during the exhibition on some panels illustrating Æsop's fables.

Examples of fibrous plaster ceiling enrichments, models of groined ceilings, scale models of details of buildings, and one of H.M. Dockyard, Bermuda, illustrate the varied character of this firm's work.

The following is a list of buildings (with their architects) in which Messrs. Daymond have executed carving:—Local Government Board Offices, Westminster, and Land Registry Offices, Lincoln's Inn, Sir Henry Tanner; Croydon, Brompton, and other County Courts, Inland Revenue Offices, and Post Offices, H.M. Office of Works; Christ's Hospital, Horsham, and Royal Naval College, Dartmouth, Sir Aston Webb and E. Ingress Bell; Society for Propagation of the Gospel Offices, Sir Wm. Emerson; Tate Gallery Extension Mansions, Hamilton Place, and Piccadilly, R.C. Church, Farm Street, W. H. Romaine-Walker and Besant; St. Mary, Moorfields, Eldon Street, E.C., Geo. Sherrin; St. John's Hospital, Leicester Square, W.C., Treadwell and Martin; Tonbridge School, W. Campbell Jones; St. Bartholomew's Hospital, E. B. I'Anson; "Hatchford," Weybridge, C. Harrison Townsend; etc., etc.

THE EXPANDED METAL CO., LTD., YORK MANSIONS, YORK STREET, WESTMINSTER. STAND 76. ROW E.

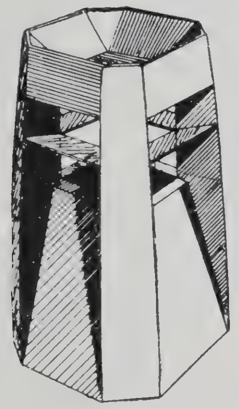
The Expanded Metal Co. have a most interesting exhibition of the very various uses to which their well-known speciality is applicable. It is, of course, most extensively used—(1) as lathing for plaster, and (2) as reinforcement for concrete.

Examples are shown of its employment in the construction of fire-resisting flooring, roofing, and walling; in plaster partitions, steelwork encasing, etc.; and in the building of expanded steel-concrete retaining walls, sewers, conduits, etc.

Examples of expanded metal "made-up" goods, such as workmen's lockers, builders' screens and riddles, workshop divisions, fencing, etc.

The following are some of the most recent works for which it has been employed:—British Museum Extension (J. J. Burnet, R.S.A.); new Admiralty Block (Sir Aston Webb, R.A.); Royal College of Science, Dublin (Sir Aston Webb and T. Manley Deane); Victoria and Albert Museum (Sir Aston Webb); Dane's Castle Reservoir, Exeter (Thomas Moulding, city engineer); Cambridge County Girls' Schools (H. H. Dunn); Grain Silos, Belfast (Spencer and Co., Melksham, engineers); Loch Leven Water Power Conduit (Meik and Meik, engineers); Teignmouth Sea Defence Works (C. F. Gettings, Council engineer); Bristol Head Post Office (H.M. Office of Works); Law Courts Extensions (H.M. Office of Works); Duveen Wing, Tate Gallery (H.M. Office of Work); Thorverton bridge, Devonshire (S. Ingram, county surveyor); Lincoln reservoir (Neil McK. Barron, waterworks engineer); Newport Technical Schools (C. F. Ward, city architect); Edinburgh Corporations slaughter-houses, Gorgie (George Morham, engineer).

MARK FAWCETT AND CO., 50, QUEEN ANNE'S GATE, WESTMINSTER, LONDON, S.W. STAND 146. WALL SPACE.



PERSPECTIVE SKETCH

Messrs. Fawcett and Co., whose pioneer work in connection with fireproof floor construction is well known, have quite recently introduced their "Mon'lithcrete" steel girders, for use in conjunction with concrete. A slab of flooring made on this principle is exhibited at this stand, and the peculiarities of the joist will be seen to consist in the perforation of the web with quadrilateral holes, which are so cut that the remainder of the web forms a series of tension bars inclined at 45 deg. with the flange. It is demonstrable that joists cut in this way, when embedded in concrete, develop more than twice the strength of ordinary joists of equal weight.

Another of this firm's specialities is the "Edwardian" chimney pot, which, apart from its efficacy in the case of smoky chimneys, may fairly claim to be the only patent pot on the market with any pretension to architectural form.

Messrs. Fawcett and Co. have carried out flooring contracts at the following:—St. Bartholomew's Hospital (new out-patients' block); St. Bartholomew's Hospital (new pathological block); Messrs. Dewar's new premises, Haymarket, S.W.; the General Steam Navigation Co.'s new offices, Byward Street, E.C.; Mr. Lingard's extension of premises, Baldwin Lane, Bradford; new Council Schools, Chopwell, Co. Durham; new Nugget Polish factory, Vauxhall, S.E.; St. Paul's Schools, Ball's Pond, N.; 47, Queen Elizabeth Street, S.E.; Mr. Ellis's new shops, Burton-on-Trent; new Grammar School, Melton Mowbray; Chelmsford Infirmary; Girls' School, Exeter; Windsor Castle additions; Hackney Infirmary, block D; Royal Boscombe and West Hants. Hospital, Boscombe; Royal Portsmouth Hospital; County School for Girls, Bangor; Workmen's Hall, Ebbw Vale.

GRANITE SILICON PLASTER CO., LTD., 34, 36, KING'S ROAD, ST. PANCRAS, N.W. STAND 25. ROW B.

Granite plaster is described as an artificial stone composition, which may be used advantageously in substitution for the ordinary lime-and-hair plaster for covering ceilings, walls, etc. It is manufactured in the form of a fine powdered material, and is put up in handy sacks. It is applied to lathwork, brick, stone, etc., in the usual way, and is exceedingly easy to work. It dries quickly, and its exceeding hardness and density render it a good non-conductor of temperature, and impervious to disease germs. Its strength and tenacity, which increase with time, render it a support instead of a dead weight.

Two very interesting features of the exhibit, to which special attention is drawn, are (1) four handsome columns and a panelled ceiling formed of the firm's Cromoleth plaster, and a 2in. solid partition composed of granite plaster on an expanded metal core stiffened with iron rods.

The list of important buildings in which granite plaster has been used fills a pamphlet. Following are a very few of the more recent works for which it has been specified by the architects, whose names appear in parentheses:—New market buildings, Gainsborough (borough surveyor); new premises, Oxford Street (Messrs. Gilbert and Constanduros); artisans' dwellings, Brantome Place (Messrs. Joseph, Son and Smithem); Imperial Tobacco Co., Drury Lane (Messrs. Spalding and Spalding and G. C. Lambert); Church Hall, Leith (J. W. Johnston); mansion, Welbury (R. Lofthouse and Son, Middlesbrough); Pathological block, St. Bartholomew's, London (I'Anson and Son); Naval Hospital, Shotley Point (the Admiralty); Naval Cadets' Hospital, Osborne (the Admiralty); convalescent home, Hitchin (C. Rees); Royal Victoria Hospital, Bournemouth (W. A. Pite); Isolation Hospital, Stone (Chapman and Snape); new Poor House Hospital, Seafield, Leith (J. W. Johnston); King's College Hospital, Camberwell (W. A. Pite).

THE GYPSUM MINES, LTD., MOUNTFIELD, ROBERTSBRIDGE, SUSSEX. 276, 277 WALL SPACE (ANNEXE

Sirapite Plaster, which, in various forms, constitutes the exhibit of this firm, is manufactured from gypsum, and is a cement plaster of somewhat similar nature to Keene's cement. It is not a "retarded" plaster of the plaster-of-Paris type, but is a thoroughly burned cement. It was first made by the Subwealden Gypsum Co., at Mountfield, Sussex, in 1891. To the end of last month more than 254,000 tons of Sirapite had been sold; and the material has been used on buildings of almost every description, from the humblest to the highest. It is quick-setting, of great strength and adhesiveness, and is entirely free from glue or other elements of putrefaction. Only two coats are required, and these may be applied with great expedition, the first coat soon becoming sufficiently firm to receive the second or finishing coat. On a plain surface, one ton of coarse Sirapite mixed with three times its bulk of sand, will cover 300 yards super ⅜in. thick, and one ton of finish used neat will cover 350 yards super ⅛in. thick. For walls, Sirapite plaster used half-and-half with common lime plaster, and for ceilings half-and-half with common lime and hair plaster, will give satisfactory results; the advantage of gauging with Sirapite being that a large quantity may be safely mixed at one time.

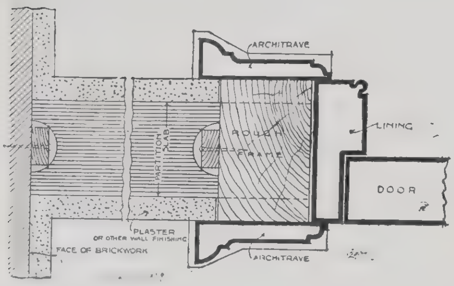
In the very long list of buildings upon which Sirapite has been used, the following are included: Royal Naval Hospitals at Plymouth, Haulbowline, Malta, Portland, Great Yarmouth, and elsewhere; Government buildings at Westminster, Aldershot, Gibraltar, Jamaica, and many other places; hospitals and infirmaries, such as Guy's, Charing Cross, the London University College Hospital, Royal National Orthapœdic, the Miller Hospital at Greenwich, the new infirmary at Penzance, the National Sanatorium at Beneden, King Edward VII. Sanatorium at Midhurst, etc.; innumerable churches, chapels, colleges, and schools; at the Savoy, Granville (Bexhill), Royal Victoria (St. Leonards), Metropole (Folkestone), the Waldorf, Piccadilly, and many other hotels; and on very many public buildings, banks, offices, etc., as Croydon Muncipal Buildings, Colchester Town Hall, the Baltic, Electra House, Salisbury House (Finsbury), Finsbury Pavement House, the National Bank of Scotland, in Nicholas Lane, E.C., etc.

GARDEL, LTD., 133b, COLDHARBOUR LANE, CAMBERWELL, S.E. STAND 274. ROW P.

"Del" Partition blocks of various thicknesses are exhibited at this stand in the form of a complete room, where they are shown unfixed, fixed, and fixed and set. The partitions are variously finished with different kinds of setting coats, and display the equally adhesive qualities of the smooth-faced blocks and those with a keyed surface. These blocks consist of plaster, breeze, and a special composition, and it is claimed for them that they are fire-resisting, sound-proof, strong, and vermin-proof.

Like many other makes of partition blocks, the "Del" can be cut for openings and pipe chasings, where required, without impairing their stability. They are made in a stock size of 29ins. by 15ins., and of thicknesses from 2 to 3½ins., and the company will erect the partitions in their entirety or supply the blocks only.

FREDERICK JONES AND CO., KENTISH TOWN, N.W.; BURTON-ON-TRENT; MANCHESTER; AND MIDDLESBROUGH. STAND 98. ROW F.

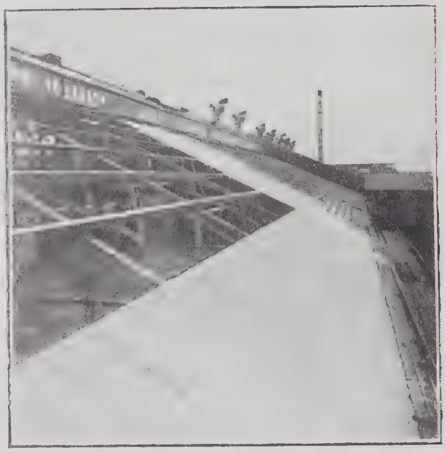


An interesting exhibit of this firm's patent Hercules fireproof partitions, in gypsum-concrete, and in Portland concrete, shows the various qualities in different stages of erection and completion.

The fibrous plaster slabs shown are employed for lining the ceilings of schools, warehouses, motor garages, and similar buildings. It is pointed out that the use of smooth-faced slabs is more economical than that of ordinary lath and plastering, and that fibrous slabs, hand-made and with canvas foundation, are crack-proof and fire-resisting. They are supplied in sheets of various sizes amounting to about a yard super.

The Pioneer silicate cotton or slag-wool, introduced by this firm about thirty years ago, is of approved value as a sound-resisting fire-proofing felt and pugging. As raw material, it is supplied in bags, and it is also manufactured in the form of slabs and felt for application to various surfaces for the purposes of insulation of various kinds.

J. A. KING AND CO., BRIDGE HOUSE, 181, QUEEN VICTORIA STREET, LONDON, E.C. STAND 71. ROW D.



Messrs. King and Co. are the patentees and manufacturers of the well-known "Mack" fireproofing goods, and at this stand are to be seen numerous specialities of this description. There are "Mack" Plaster Partitions, with slabs keyed for plastering, and others smooth-faced, requiring none; "Mack" ceiling slabs; "Mack" fireproof pugging slabs and blocks, from 1in. to 6in. thick; and the 5in. "Mack" fireproof pugging blocks, specially designed for fire-proofing projecting shop fronts. "Mack" slab construction for floors is also shown, where the slabs rest on the lower flanges of the steel joists. "Mack" slabs may be used for fire-resisting roof construction, as may be seen from the specimen exhibited. Several fine examples of old and decayed stone work, parts of which have been restored and treated according to the process adopted by the Stone Preservation Co., will be exhibited on this stand. Architects, builders, and others interested in the subject of cleaning and preserving stone buildings, would do well to closely scrutinize these exhibits.

Among other things being shown are "Mack" fireproof lathing for encasing columns; a patent cement for restoring stonework; a patent fluid for preserving stonework; and the "King" fireproof pumice-concrete partition.

The following is a list of buildings (with their architects) in which the "Mack" specialities have been used: The Guildhall, London, Sidney Perks, City Surveyor; the Victoria and Albert Museum, Kensington, Sir Aston Webb, R.A.; Christ's Hospital, Horsham, Sir Aston Webb, R.A., and E. Ingress Bell; Bank Buildings, Princess Street, E.C., Sir Arthur Blomfield and Sons; Mappin and Webb's new premises, Oxford Street, London, W., John Belcher, R.A.; D. H. Evans and Co.'s extensions, Oxford Street, London, W., J. Murray; Union of London and Smith's Bank, Lombard Street, E.C., Dunn and Watson; Union of London and Smith's Bank, Cornhill, London, E.C., W. Campbell Jones; L. C. and M. Banks, branches in London and Provinces, T. B. Whinney; Women's Hospital, Waterloo Road, London, S.E., Waring and Nicholson; Hammersmith Workhouse and Infirmary, Shepherd's Bush, London, W., Giles, Gough and Trollope; Municipal Dwellings, Croydon, and Croydon Mental Hospital, Warlingham, G. F. Carter, Borough Engineer, Croydon; London Hospital, London, E., Rowland Plumbe; Guy's Hospital, London, S.E., Wood and Ainslie; Salvation Army Shelters, Devonport, etc., Oswald Archer; University College, Gower Street, London, Professor F. M. Simpson; Town Hall and Law Courts, Russell and Cooper; etc., etc.

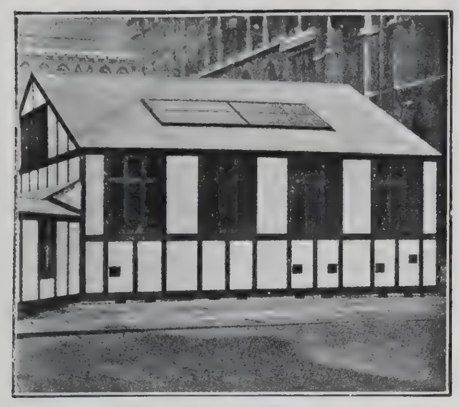
THE LEWIS CONSTRUCTION CO., LTD., JUPP ROAD, STRATFORD, E. STAND 56. ROW G.

This system of reinforced concrete construction depends for its distinctive character almost entirely upon the dovetail corrugated steel sheeting which is employed. This is formed out of thin steel plates of various gauges, so bent as to form dovetails on either side, and was originally employed in the construction of partitions only. Now, however, its application has become very general, and the system is adaptable to the construction of walls, beams, columns, floors, and even window frames, etc. In conjunction with channel and T irons, and round steel bars, the dovetail sheeting forms a very efficient system—combining great strength with a relatively small use of concrete. The reinforced concrete sashes and frames are constructed of granite concrete reinforced with light round rods, and in the case of reinforced doors they are made of dovetail sheeting, special section channel iron, and round steel rods.

Architects should make a point of studying the structure erected at this stand, in which the application of this system of construction is clearly demonstrated.

The following is a list of buildings (with their architects) in which the Lewis Construction Co.'s system has been adopted: Devonshire House, Piccadilly, Stephen Box, A.R.I.B.A.; New University, Cardiff, W. D. Caroe, A.R.I.B.A.; Walthamstow Education Committee, H. Prosser, M.S.A.; Mizen Head Bridge, Ireland, M. Noel Ridley, A.M.I.C.E.; London and County Bank, Walton, W.A., Burr; Desiccated Grain Co. Factory, Rotherhithe, Wreford and Wright; extension to Town Hall, Leyton, Newman and Jacques, A.R.I.B.A.; etc., etc.

MACHIN AND KOENIG, 17 AND 18, ROSCOE STREET, E.C., AND G. R. SPEAKER AND CO., 29, MINCING LANE, E.C. STAND 9. ROW A.



This exhibit consists of a "half-timbered" pavilion, shewing the application of Speaker's "Eternit" asbestos slabs for exterior and interior walls and ceilings, and Speaker's "Eternit" roofing tiles (in various colours and patterns) for the roof.

Compo-board, in its application to ceilings and interior walls, both plain and papered, is also shown.

Among various specialities may be noticed veneered panels mounted on asbestos slabs, laminated wood panels (up to 48ins. by 48ins. 3-16in. and ¼in. thickness, "Superior" panels in waterproof birch and alder, and Speaker's "Eternit" fireproof door.

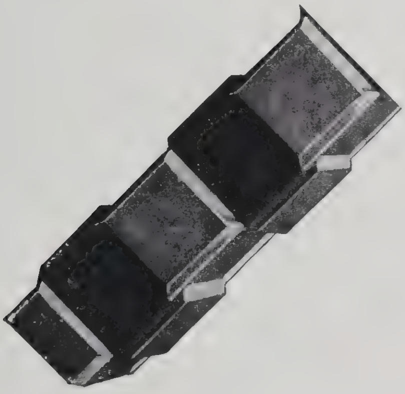
Speaker's "Eternit" has been known in Great Britain for the last six or seven years. Its insulating qualities are of the first order, and the weight of a finished roof done in "Eternit" is about one-fifth of the weight of a natural slate roof. The material is known not only to all the Government departments which do building, but also to the various County Councils, including the London County Council.

The tensile strength of "Eternit" tiles is 5,781lbs. per square inch, its crushing force being 8,281lbs. per square inch. The lightness of the material is a valuable consideration, and while the initial cost is practically the same as that of best Welsh slates, "Eternit" roofs require no upkeep, for in ratio with their age the roofs increase in strength.

For panels, ceilings, and walls, "Eternit" is supplied in sheets 8ft. by 4ft. These sheets are light, of immense mechanical strength, are easily erected, and constitute an excellent and economical wall lining.

Many important Government contracts have been carried with Speaker's "Eternit" roofing tiles in Jamaica and Gibraltar, Sheerness, Chatham, Devonport, York, Salisbury Plain, as well as in Ireland and Scotland.

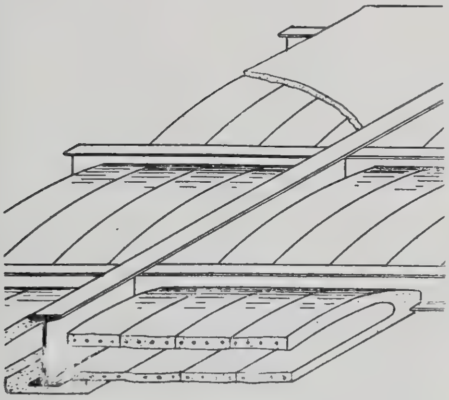
THE PATENT INDENTED STEEL BAR CO., LTD., QUEEN ANNE'S CHAMBERS, LONDON, S.W. STAND 24. ROW B.



The great variety in the design and type of bars for reinforcing concrete is the natural outcome of a system of construction which, however widely it has been adopted for many classes of work, is still in its infancy; in fact, it can only be in this direction that ultimate experiments and improvements will eventually lead to the discovery or invention of a type of reinforcement which shall be capable of giving the best general results under all conditions and circumstances. The patent indented bar here exhibited is of square section, and is "indented" or depressed at regular intervals in its length on each of its faces. It is made of rolled steel in the following sizes, viz.:—¼in., ⅓in., ½in., ⅝in., ¾in., ⅞in., 1in., and 1¼in. square.

The following are some of the recent buildings for which this reinforcement has been supplied:—Selfridge Stores, R. Frank Atkinson, F.R.I.B.A., architect; Medway Conservancy Offices, Rochester; coal bunkers for Borough Electrical Engineer, Croydon; Montgomery's Bakery, Govan; Schools, Bromley, Kent, for Kent Education Committee; South Darley Waterworks Extensions; Water Tower, Gosnall, Staffs.; reservoir covers, Whitehaven Waterworks; Main Drainage Works, Glasgow; strong room, Belfast; Sea Defence Works, Teignmouth, C. F. Gettings, engineer; Register House, Edinburgh; Bank Buildings, Jamaica; Galleries, Hull Cattle Market, for City Engineer; brewery floors, Messrs. Bass and Co., Burton-on-Trent; warehouse, Bombay; etc., etc.

D. G. SOMERVILLE AND CO., 116, VICTORIA STREET, LONDON, S.W. STAND 141. ROW H.



Messrs. Somerville and Co. exhibit a model of the building erected for the National Telephone Co. at Paddington, from the designs of Mr. Leonard Stokes, F.R.I.B.A., in which building the steel and concrete construction was carried out by this firm.

Full-size specimen sections of hollow reinforced fireproof floors and roofs are also shown, together with reinforced concrete piles, columns, and beams.

In regard to the floors, two types are exhibited. Type "A" consists of hollow reinforced concrete tubes, supported between steel joists, with the usual concrete filling in to form the floor surface. This system requires no centreing.

Type "B" has rectangular hollow tiles of fireclay or cement, with steel reinforcing bars (embedded in strong concrete) between them. The bars are turned up at the ends where necessary, to resist shearing stresses. Unless the span is considerable, the tiles merely require a screeding layer as a preparation for finished floor.

The following is a list of buildings (with their architects), where Messrs. Somerville's floors have been used:—Paddington, Brixton, Hammersmith, and Deptford Telephone Exchanges: Chelsea Town Hall; Mansion House, Inholmes; Leonard Stokes, F.R.I.B.A. Jewish Girls' Home, Walworth; St. Giles' Mission Hall, Kingsway; Messrs. Rumplemeyer's new premises; covering to District Railway; and Norwich Insurance Offices, Piccadilly; Messrs. Runtz and Ford. Virginia Sanatorium, Cardiff University Settlement, and Church, Edinburgh; W. R. Schultz. Hendon Electricity Works; W. Curtis-Green. Flats, James Street, and mansion, Englefield Green; Forsyth and Maule; Messrs. Sanderson's premises, L. A. Hayes, A.R.I.B.A.; etc., etc.

THE SAXON PORTLAND CEMENT CO., LTD., CAMBRIDGE. STAND 187. ROW K (ANNEXE).

NORTHFIELD RESERVOIR, BIRMINGHAM.

The vital part played by Portland cement in reinforced concrete construction gives this company's exhibit more than ordinary interest. Since the invention of Portland cement in 1756 great improvements have been made in the process of manufacture, with the result that of late years its tensile strength has greatly increased.

The raw material from which this company makes its cement is a "chalk-marl," consisting of a combined chalk and clay deposit, containing from 15 to 25 per cent. of clayey matter, and about 79 per cent. of carbonate of lime. After mixing, the damp material is dried on rotary drums, and then ground in the mills till it is so fine that no residue remains on a sieve having 5,800 meshes per square inch. Tensile strain—600lbs. per square inch in seven days.

The following are some of the contracts on which the cement has been used:—Admiralty, War Office, H.M. Office of Works, General Post Office, London County Council, and the following other public works:—Derwent Valley Water Board Contract, Birmingham, Tame and Rea District Drainage Board, Manchester Corporation Moss Side Baths and Conveniences, Manchester Midland Hotel, Manchester Hippodrome, Manchester Opera House, Manchester Blackley Infirmary, Stockport Hayfield Reservoirs (20,000 ton contract), Stockport Town Hall; Stockport Pipe Track (New Mills to Hayfield), Withington Workhouse extensions and drainage, Manchester Stock Exchange additions, Widnes gasholder tank, Lancashire County Council bridges, Radcliffe Paper Mills, Hyde gasholder tank, Leeds police station; Oxford library, Lincoln College; Hertford Christ's Hospital, St. Thomas' Hospital, Boston Harbour Trust, Ipswich Electric Power Station, etc.

SIDEOLITH, 19, TEMPLE STREET, BIRMINGHAM. STAND 115. ROW G.

The Sideolith system of reinforced concrete construction, which is applicable to every variety of work of this description, including lintels, beams, columns, foundations, flooring, and roofing, is represented by a specimen of hollow block flooring, and a series of the "skeletons" employed for reinforcement.

As will be seen from the accompanying illustration, the reinforcement is produced from single bars of steel of varying thicknesses, split and expanded into girder-like form, the parts being apportioned and adjusted to take the tensional and shearing strains without waste or danger of displacement. The completed structure is very light, yet with great bearing capacity.

The firm point out that, in brick and stone buildings, individual features, such as lintels, beams, columns, floorings, roofings, etc., can with great advantage be constructed of reinforced concrete which in many positions is much more desirable than wood, for which in many cases, considering its superior durability and strength, its non-inflammability, its non-liability to attacks by insects, it is in the long run a really economical substitute. The proprietors of Sideolith hold that the safest form of reinforced concrete flooring is constructed on the same principle as wood-joisted flooring, namely, with joists at moderate distances apart (say, about 3ft. centre to centre), and thin slabbing, instead of using larger beams at greater distances with thicker floor slabbing.

The following are a few of the works at which Sideolith has been used (the names of the architects are enclosed in parentheses):—Grand Theatre, Oldham (Thomas Taylor); Convent of Mercy, Oldham (Thomas Taylor); extensions, General Hospital, Birmingham (Henman and Cooper); Messrs. Jarrett and Rainsford's new premises, Birmingham (Henman and Cooper), etc., etc.

JAMES H. TOZER AND SON, LTD., YORK MANSION, YORK STREET, WESTMINSTER. STAND 28. ROW B.

Messrs. Tozer's exhibit is designed to illustrate the various methods of using their "Lock-woven" mesh reinforcement as applied to walls, floors, roofs, sewers, and similar works.

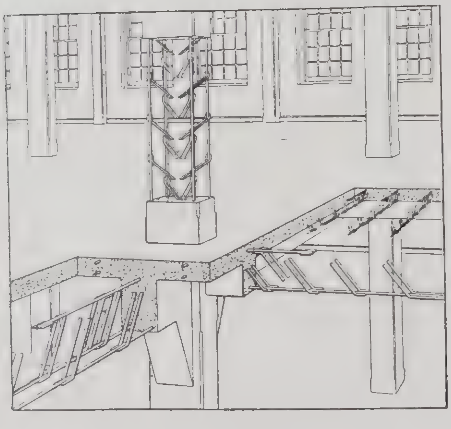
A concrete structure consisting of columns on pedestals, with entablature over, shows the adaptability of the "Lock-woven" mesh reinforcement under everyday circumstances.

Its application to sewer construction is demonstrated by a short section of an egg-shape sewer (of 5ft. by 3ft. 4ins. internal dimensions), and there is by the side of this exhibit a portion of a 5ft. 6ins. high retaining wall similarly reinforced.

Floor and roof construction are also shown. In the latter the mesh is employed in continuous lengths in a very efficient manner. Concrete fencing posts, fire-resisting partitions, etc., further illustrate the general constructional uses of this mesh.

In the suspended floor and roof on exhibition, in the latter the application of the continuous lengths of lock-woven mesh is demonstrated. The mesh in the roof slab is brought down at the end of the roof, and is joined up to the floor below, a smaller mesh being wired to the heavier concrete mesh and then plastered to form a solid partition. The heavy concrete mesh dispenses with any necessity for rods or other fixings for the lighter plastering mesh.

THE TRUSSED CONCRETE STEEL CO., LTD., CAXTON HOUSE, WESTMINSTER, S.W. STAND 80. ROW E.



This company exhibit a number of models illustrating the manner in which the Kahn trussed bar is used in their system of concrete reinforcement. This is particularly well demonstrated in one showing a reinforced concrete beam, which enables the visitor to see for himself how completely the concrete packs itself round the diagonals of the trussed bar at their junctions with the main bar.

The model reinforced concrete lintol which is shown, is an interesting one, and architects and contractors should inspect it, as it appears to offer a useful suggestion for economical and rapid lintol construction.

Of more general interest, perhaps, is the machine used by the company in the manufacture of their patent bar. Machinery in motion always attracts, and this will prove no exception. Pieces of the bar will be presented as souvenirs, to those who care to apply for them.

The following is a list of works in course of construction on the Kahn system. The name of the architect or engineer is given in parentheses:—Wesleyan Methodist Hall (Lanchester and Rickards); Y.M.C.A., Manchester (Woodhouse, Corbett and Dean); York Towers, North Eastern Railway (W. J. Cudworth); Loch Long Jetty (Admiralty); Exeter Reservoirs (T. Moulding); Southampton Schools (J. A. Crowther); Cheetham's Mills; Brighouse Mills (Sharp and Waller); Bridges, Chingford reservoir (Metropolitan Water Board); Bridges and Stands, York Race Course (Walter H. Brierley); Football Stand Twickenham (J. E. Profit); Football Stand, Bradford; Scottish Union Offices, Leeds (Perkin and Bulmer); Motherwell Reservoir (J. McMillan); extension to Kodak Works, Harrow (S. V. Haus); Pickelden Bridge (H. P. Maybury); etc., etc.

UNITED KINGDOM FIREPROOFING CO., LTD., 47, VICTORIA STREET, LONDON, S.W. STAND 90. ROW F.

At this stand are to be seen a variety of floor sections illustrating the several systems of fireproof construction advocated by the company. It will be seen that each is based on the ferro-concrete principle, and embodies methods of application suitable for specific cases. For instance, system No. 1 consists of hollow concrete tubes, about 3ft. wide, supported on ferro-concrete beams, covered with a layer of concrete of sufficient depth to take up all compressional stresses. The beams, which may be either cast beforehand, or "in situ," are made up to 30ft. in length. Such a floor as this is recommended for use in hospitals, schools, and other buildings where level ceilings and sound-proof floors are essential.

System No. 2 is composed entirely of hollow concrete beams (cast before fixing) with dovetail joints between them, which are grouted in after erection. This type of floor is very rapidly constructed, and may be finished and be ready for use in less time than is usually allowed to elapse before the temporary boarding of an ordinary concrete floor can be removed.

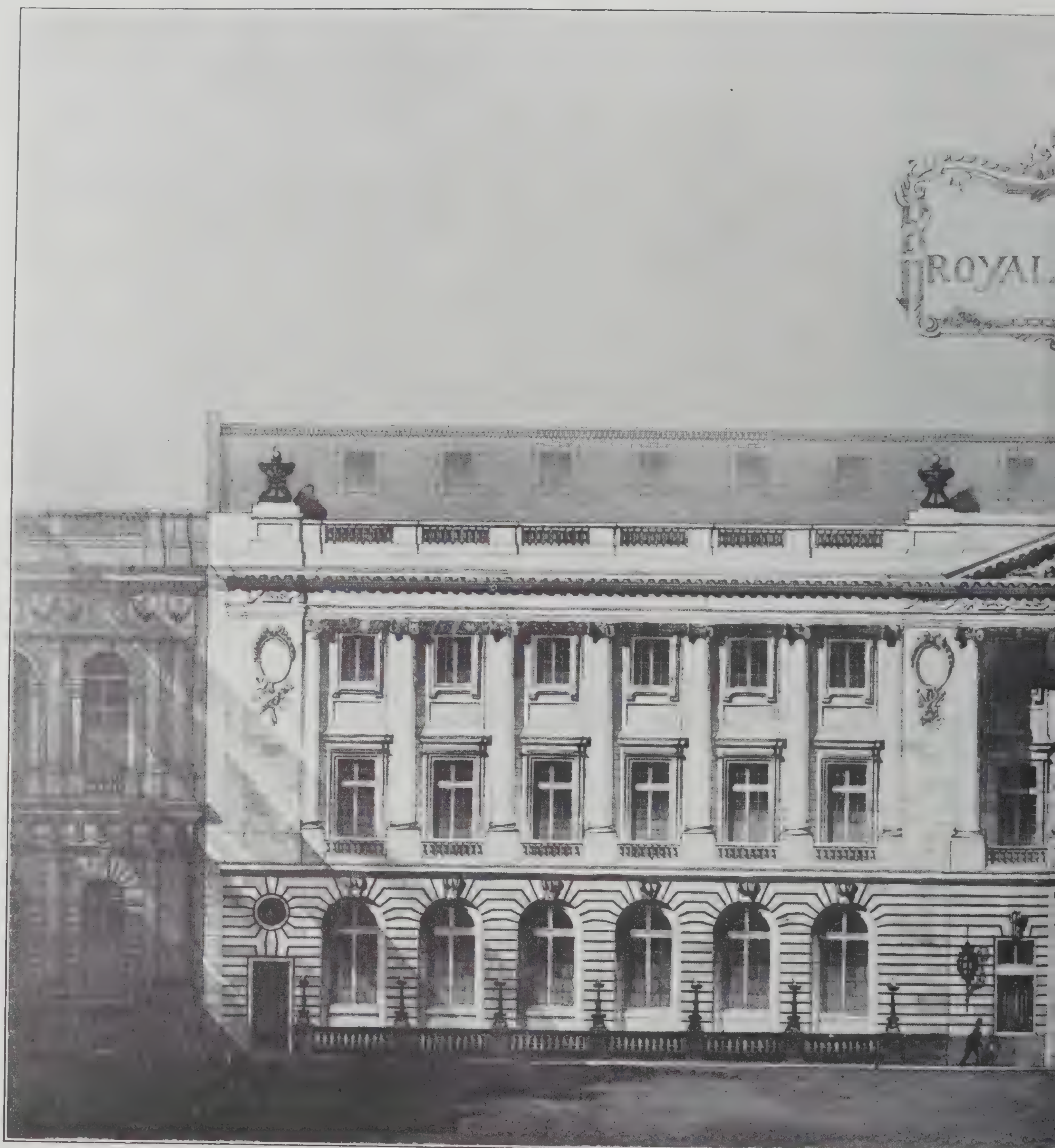
System No. 3 has terra-cotta lintels resting on the splayed flanges of reinforced concrete beams, and on account of its lightness and soundproof qualities, is especially adapted for dwelling houses and private residences where light loads only obtain.

System No. 4 has been designed for use where very deep girders are employed, and where the ceilings must at the same time be level. In this system terra-cotta cover plates (cambered) and ceiling plates of similar material, span the openings between the reinforced concrete beams, which are specially haunched to receive them.

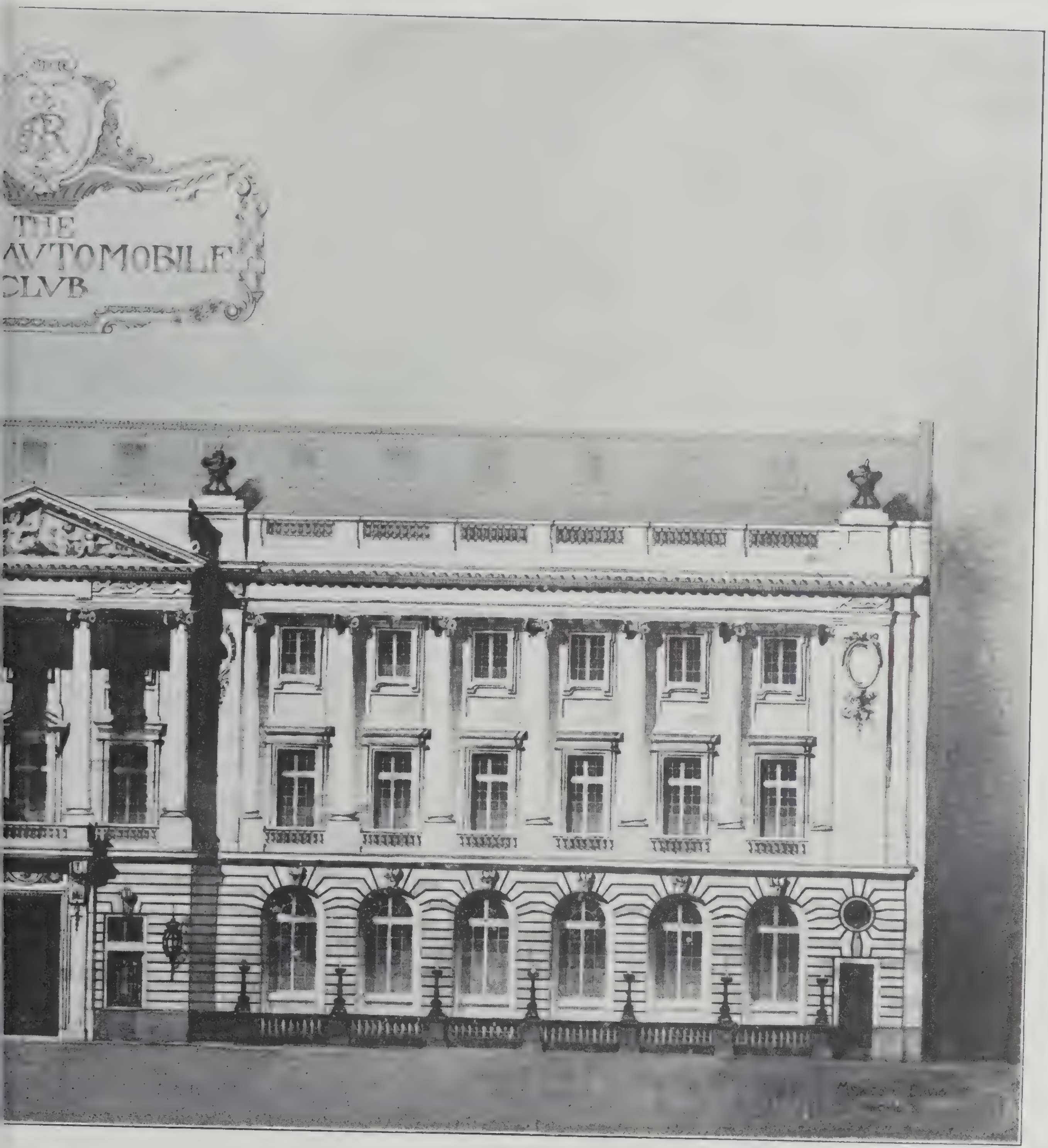
The remaining systems bear a more or less close resemblance to those described, and embody modifications of detail rather than of principle.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

Supplement to THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER, *Wednesday, April 21st, 1909.*



THE FACADE AT PALL MALL. MEWES & DAVI



D E. KEYNES PURCHASE, ASSOCIATE ARCHITECTS.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

THE WOULDHAM CEMENT CO., LTD., 35, GREAT ST. HELENS, LONDON, E.C. STAND BAY 9a, GALLERY P. 374.

This firm are exhibiting samples of their finished products, "Red Cross" brand Portland cement, and "Reinforcrete," a cement specially prepared for use in ferro-concrete structures.

The whole of the firm's cement is guaranteed as more than fulfilling every requirement of the British Standard Specification, as revised June, 1907.

They also exhibit various models made from their cements, and samples of raw materials, including chalk, clay, coke, coal, etc. Also samples of the cement in a partly manufactured state in the form of slurry and clinker.

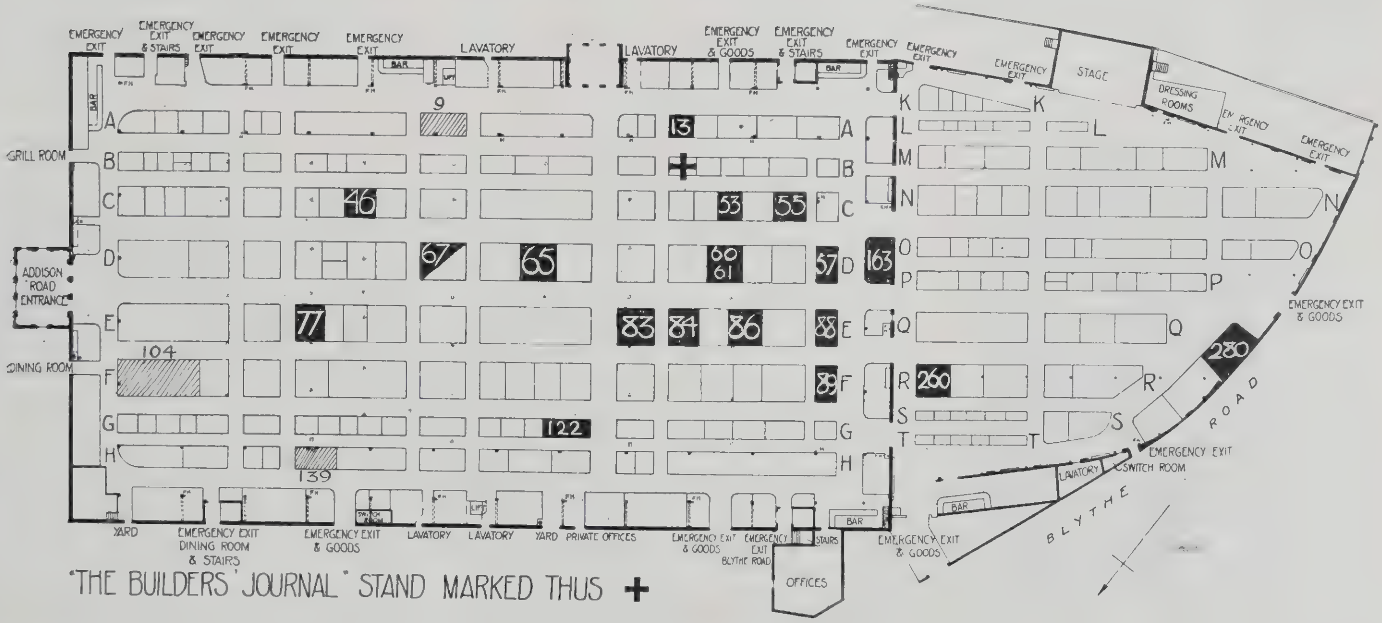
Having their own cooperages, the firm make a feature of supplying casks of specially good make, such as are in every way admirably adapted for export shipments. Leakage from the casks is practically impossible, owing to all the joints, both of bodies and of ends, being tongued and grooved.

A few of the works upon which this Portland cement has been used during recent years are as follows:—Admiralty Harbour Works, Dover and Malta; New Ross and Waterford Railway; Surrey Commercial Docks; London County Council; Plymouth main drainage; Dublin main drainage; Seaham Harbour; Great Northern and City Railway; Mersey Docks and Harbour; East London Waterworks; Catford-Plumstead main drainage; Hull Joint Docks; Great Western Railway; Isna Barrage, Egypt; Egyptian State Railways; Nile Bridges, Egypt; Constantinople Docks and Government Buildings; Southern Nigeria Railway; Cartagena Waterworks; Dorado Railway extension, Panama Canal; Bolivar Railway; Colombian National Railway; Bolivian Railways; Vera Cruz and Coatzacoalcos Harbours; Rio de Janeiro Improvement Works; Para Port Works; Argentine North-Eastern Railway; Central Argentine Railway, etc., etc.

SECTION FIVE.

Timber. Woodwork and Joinery. Parquet, Wood-block and Composition Floorings.

GROUND PLAN



"THE BUILDERS' JOURNAL" STAND MARKED THUS +

Section V.—WOODWORK.

The following firms are noticed under this section, and their stands are blacked in, with numbers in white:—

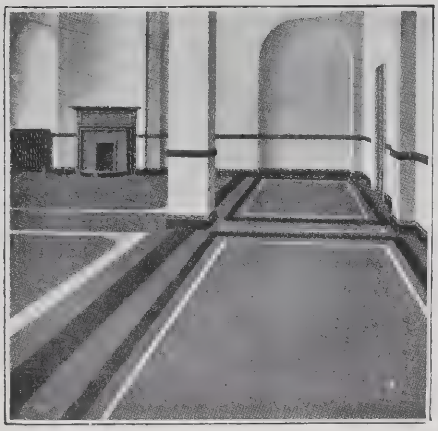
57	D	British Doloment Co., Ltd., (The), p. 376.
46	C	Bath Cabinet Makers' Co., Ltd., p. 376.
86	E	Cleaver, H. C., Ltd., p. 376.
280	Wall Space Annexe	Ebner, Jos. F., p. 376.
122	G	Elliott, Samuel, and Son, Ltd., Reading, p. 377.
55	C	Elliott's Moulding and Joinery Co., Ltd., Newbury, p. 377.
65	D	"Excellence" Wood Block Flooring Co., (The), p. 377.
67	D	Gilmour Door Co., Ltd., (The), p. 377.
61	D	Goodwin, H. C., and Son, p. 378.
83, 84	E	Höfler, Ltd., p. 378.
163	Wall Space	Ingram, Perkins, and Co., p. 378.
89	F	Pemberton, Arber and Carey, p. 379.
13	A	Shannon, Ltd., (The), p. 379.
60	D	Venesta, Ltd., p. 379.
53	C	Van Kannel Revolving Door Co., Ltd., p. 379.
77	E	White, John P., p. 380.
88	E	"Young" Firm, (The), (E. C. Young), p. 380.

REFERENCES.

The following firms are noticed in other sections, but are showing exhibits connected with this one. Their stands are indicated by hatching:—

104	F	Art Pavements and Decorations, Ltd. (The), (Wood Block Parquet and Armadek Floors), p. 358.
139	H	Daymond, John and Son, (Wood Carving), p. 370.
9	A	Machin and Koenig, p. 373.

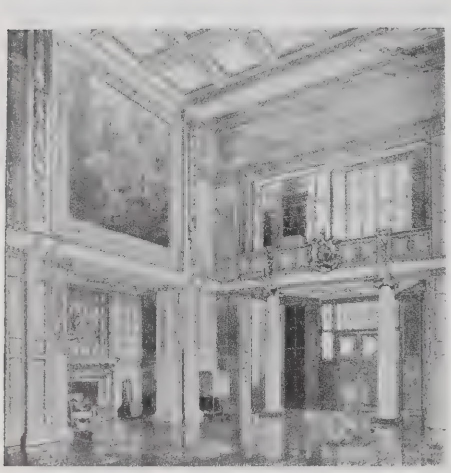
THE BRITISH DOLOMENT CO., LTD., CAXTON HOUSE, WESTMINSTER, LONDON, S.W. STAND 57. ROW D.



This well-known flooring material is laid ⅞in. thick, in a double layer, and is guaranteed not to crack or bulge. It is elastic, non-absorbent, non-inflammable, and jointless, and is specially adapted for hospitals, schools, and public buildings. Doloment is applied to walls as well as floors, and can be finished in many colours and designs in imitation of granite, mosaic, or marble. The company points out that to ensure a perfect result it is absolutely necessary that the foundation of the floor should be dry, solid, and free from lime. It need not necessarily be smooth, but it must be level. On account of its elasticity it does not crack, even if the foundation should settle. In addition to the above properties, it is without odour, and will not burn. As a flooring for hospitals, laboratories, etc., its imperviousness to wet, and the ease with which it can be kept clean it is particularly suitable, and during the two years it has been on the market has been largely used in buildings of these descriptions.

The following list includes public bodies using the British Doloment Company's patent flooring and buildings in which it has been used:—H.M. Office of Works, the War Office, the Admiralty, Royal Arsenal, H.M. Prisons Commissioners, Metropolitan Asylums Board, the London County Council, City of London Union Infirmary, Royal Infirmary, Manchester, St. Mary's Hospital, Manchester; Royal Ophthalmic, London; Royal Infirmary, Dundee; Royal Southern, Liverpool; Royal Bucks General Hospital, Westmoreland County Asylum, Church House Schools, Windsor; St. Jude's Hall, Stratford; Maldon Grammar School, King's College, Strand; Ley's Schools, Cambridge; Wolverhampton Grammar School, Prices Schools, Fareham; etc., etc.

THE BATH CABINET MAKERS' CO., LTD., TIVERTON, BATH; AND 18, BERNERS ST., W. STAND 46. ROW C.



What may be called architectural furniture is represented by the exhibits of this firm, whose staff includes not only skilled designers of furniture, but also trained architects.

Representative examples of the firm's work include a portion of an oak-panelled room in the Elizabethan style, with carved tracery frieze, and also a Georgian inglenook with panelled walls and ceiling, and with china cupboards built into walls at the sides of the fireplace. There are also examples of Charles II., Queen Anne, and Chippendale chairs, tables, etc.

Among the works that have been executed by this firm the following may be mentioned:—The entire furnishing, decoration, and joinery, for Sir George White's house, "Cotham House," Bristol (Messrs. Oatley, F.R.I.B.A., and Lawrence, A.R.I.B.A., architects), contains fine Georgian work, and Grinlin Gibbons' carvings. The Bristol Stock Exchange complete (H. Williams, M.S.M., architect); fine Elizabethan panelled rooms and inglenook, etc., for Mr. E. A Trapnell, at Clevedon Hall (W. H. Watkins, A.R.I.B.A., architect); the Strand Palace Hotel, for J. Lyons and Co., Ltd., complete furnishing (W. H. Ancell, A.R.I.B.A., architect); Council chamber and committee room for March County Hall (Herbert J. Green, A.R.I.B.A., architect); wood carving for Churchill Cottage Homes (Messrs. Silcock and Reay, F.R.I.B.A., architects); board-room, etc., Cosham Memorial Hospital, Kingswood (F. B. Bond, F.R.I.B.A., architect); dining hall, Lisvane Manor (Herbert Davis Richter, architect and artist); shop-fitting and showcases at Selfridge's, Oxford Street; billiard room in oak for Littlejohn Philips, Esq., Box, Wilts (H. Davis Richter, architect); shopfitting for James Colmer, Ltd., Bath, and for Waymark and Company, Tunbridge Wells, pine panelled hall in New York (H. Davis Richter, architect); banqueting hall at the Park Hotel, Cardiff (H. Davis Richter, architect); offices for Sir George White and Co., Clare Street, Bristol, in Spanish mahogany (Oatley and Lawrence, architects); etc., etc.

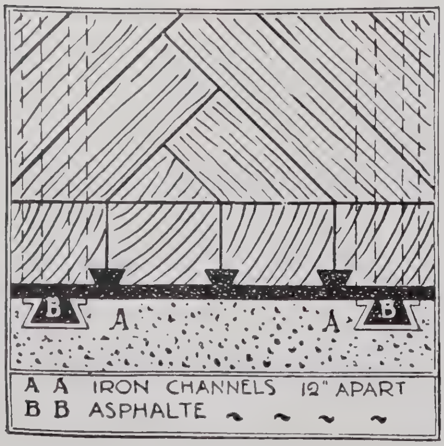
H. C. CLEAVER, LTD., 35, BERNERS STREET, LONDON, W. STAND 86. ROW E.

"Tudoresk" patent oak panelling for walls is the principal feature of this exhibit, and may be brought to the notice of architects as a new method of construction. In this patent the panelling is built up section by section (as it is fixed) on a system of interlocking grooves and tenons. Each separate piece is secretly nailed, and by this means no nail or screw heads appear on the surface.

The exhibit includes chimney-piece treatments, solid oak panelled front and interior doors, parquet flooring, and the patent Tudor letter filing cabinet. This possesses some novel features, and the trays can be converted by a simple arrangement into ordinary drawers or a fully-equipped card index.

The following is a list of buildings where "Tudoresk" has been specified and fixed:—New School at Folkestone, J. Dixon Butler, F.R.I.B.A.; house at Northolt, J. Dixon Butler, F.R.I.B.A.; house in Kensington, J. Dixon Butler, F.R.I.B.A.; Queen Elizabeth's Grammar School, Blackburn, Herbert Stones, bungalow at Broadstairs, John Murray, F.R.I.B.A.; house at Ormesby, Jas. Forbes; Alexandra Hotel, Saltburn, Jas. Forbes; house at Middlesbrough, Jas. Forbes; house at Saltburn, Jas. Forbes; house at Mansfield, Vallance and Westwick; Swan Hotel, Mansfield, Vallance and Westwick; Foxcote Manor, Buckingham, T. H. Bishop, A.R.I.B.A.; house at Ealing, Brown and Barrow; house near Cheltenham, Chatters and Smithson; house at Oxshott, Niven and Wigglesworth; house at Billingshurst, Peach and Ramsey; flats in Portland Place, H. J. Colebrook; house in Prince of Wales' Terrace, L. J. Williams, A.R.I.B.A.; etc., etc.

JOS. F. EBNER, STEWART STREET, CUBITT TOWN, LONDON, E. STAND 280 WALL SPACE (ANNEXE).



One of the principal features at this stand is a collection of samples of the Jointless Composition Flooring known as "Ebnerite." This material is not intended as a substitute for this firm's Parquet Flooring or Marble Terrazzo Pavings, but rather for such situations as would not be suitable or possible for either of them.

"Ebnerite" is composed of wood fibre, fine mineral powder, and a cementing liquid. It is laid with a trowel, in a plastic state, and becomes hard in about 35 hours. The finish can be either rough, polished, oiled, or bees-waxed like a Parquet floor. It can be laid on concrete, stone, or wooden subfloor, new or old, even if much worn. In appearance it is not unlike linoleum, and as it is silent and resiliant to walk on, is warm to the feet, non-slipping, and cleanly. It may be recommended for all classes of buildings. The following is a list of buildings (with their architects) in which this firm's specialities have been used:—Queenstown Cathedral, Ashlin and Doolin; Shire Hall, Norwich, E. J. Tench; Milton Asylum, Portsmouth, Rake and Cogswell; 49-50, New Bond Street, London, W., Walter Cave; several schools for Education Committee, Manchester; and Education Committee of Norfolk; New Theatre, Cork, Arthur Hill; Queen's Hospital, Birmingham, E. Harper and Brother; London Joint Stock Bank, Kingsway, R. Creese, Harrison and Son; King Edward VII. School, Southampton, Mitchell, Son, and Gutteridge; Welbeck House, Wigmore Street, Bockmer and Gibbs; Debenham and Freebody's premises, Wigmore Street, W. Wallace and J. S. Gibson; Thorney Court, London, W., Millard and Pryce; several generating stations, London County Council; Queen Margaret's School, Scarborough, F. A. Tugwell; etc., etc.

ELLIOTT'S MOULDING AND JOINERY CO., LTD., ALBERT WORKS, NEWBURY. STAND 55. ROW C

This stand, of somewhat ambitious design, consists of four built-up yellow pine Ionic columns with carved capitals, and moulded entablature over, finished in white enamel, and all of high-class workmanship. Conspicuous among the specimens exhibited is an oak screen for Isfield Church, near Bexhill-on-Sea, made from the designs of Mr. John Rawlinson, A.R.I.B.A. This is a very delicate piece of tracery work, and contains some good carving. An example of classic work is shown in the polished mahogany entrance doors, which are of fine figure and of substantial make. These doors are surrounded by a frame, with pilasters attached, surmounted by a carved overdoor.

Messrs. Elliott are showing an improved kind of revolving door (Buckingham's Patent) which should be particularly noted. The rest of the exhibit comprises a very complete collection of mouldings made in various kinds of hard and soft woods, and a deal door and overdoor.

The following is a list of buildings (with their architects) in which Messrs. Elliott's joinery has been used:—St. Etheldreda's Church, Ely Place, and Watford Holy Rood Church, the late J. F. Bentley; Wycliffe Hall, Oxford, W. Wallace; Holy Trinity Church, Tooting, Leonard A. S. Stokes; Church House, Gt. Smith Street, Westminster, Sir Arthur Blomfield and Sons; Welbeck Palace Hotel and Flats, Boehmer and Gibbs; Navarino Mansions, Dalston Lane, Joseph and Smithem; Llanelly Parish Church, E. M. Bruce Vaughan; Mansion, Pwllheli, N. Wales; West Ham Board of Guardians' Offices, J. W. Dunsford, M.S.A.; Ordnance Survey Office, Southampton; Capital and Counties Bank Head Office, Threadneedle Street, G. H. Hunt; Capital and Counties Bank, 335, High Holborn, Paul Waterhouse; etc., etc.

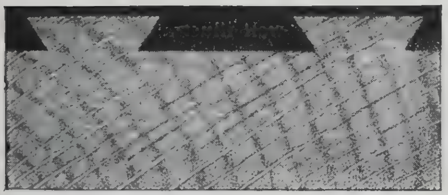
SAMUEL ELLIOTT AND SONS, LTD., CAVERSHAM, READING. STAND 122. ROW G.

The exhibition of work that has been actually commissioned undoubtedly lends an added zest to the inspection of the object, and Messrs. Samuel Elliott and Sons provide us with this agreeable sensation. They show, for instance, an oak ingle that has been executed for a contract in the West of England, and also a special Spanish mahogany door destined for Gaddesdon Place (the late Cole A. Adams, F.R.I.B.A., architect). The firm show also many and various other specimens of joinery work which has won for them many medals and diplomas in the past. They have also on view a large display of their mouldings of registered designs, of which more than 1,600 sections are shown in their catalogue; and they have added an interesting selection of examples of square and round turning.

A leaflet which they are circulating illustrates some specimens of ecclesiastical carving that have been executed by this firm, the examples including a lectern executed for Mr. S. S. Stallwood, architect; details of a screen executed under Mr. F. B. Wade, architect, for the Roman Catholic Church at Caversham, and of another screen made to the design of Mr. B. Ingelow, architect, for Sherborne Abbey; and the panelling, doors, and bookcases to a corridor library, more than 300ft. long, in Westminster Cathedral.

The claim—we forget for the moment who had the happy inspiration to advance it—that "there is something noble in woodwork," involuntarily arises in the memory as one gazes at the many dignified and stately examples of wood-carving here shown. The firm, we understand, are particularly expert in the production of Gothic-style carving for ecclesiastical uses, as, indeed, the specimens of their work that are shown at this Exhibition sufficiently attest.

THE "EXCELLENCE" WOOD-BLOCK FLOORING CO. WORKS, PROSPECT SAW MILLS, LEEDS. LONDON OFFICES 11, QUEEN VICTORIA STREET, E.C. STAND 65. ROW D.



At this stand the chief exhibit consists of a display of samples of wood blocks and panels illustrating "Nicholson's" patent "dovetailed" system of wood block flooring. These are in various woods. This company's flooring blocks have a particularly effectual key, consisting of dovetail grooves on their undersides. The blocks are dipped in hot mastic in the usual way and laid on a perfectly smooth cement screeding. They are made of 1in., 1¼in., 1½in., and 2in. thicknesses, by 9in., 12in., 15in., and 18in. lengths, and are 3in. wide. Deal, pitch pine, and oak are the usual kinds supplied, but they may be had in any other suitable wood if required.

In addition to the above exhibit, the company has some good joiners' work on show, such as a walnut counter and some screen framing, etc., executed by Messrs. Wm. Nicholson and Son, Ltd., of Leeds.

The following is a list of buildings (with their architects) where "Excellence" wood block floors have been specified: Several schools, W. S. Braithwaite; several schools for the West Riding County Council, J. V. Edwards; new schools at Reddish, Stockport, Cheers and Smith; schools at Whitwell Bottom, Waterfoot, A. Brocklehurst; George Street School, Chester; Acton Schools, London, E. C. P. Monson; Middlesex County Council, G. H. Crothall; Merrywood Road Schools, Bristol, H. D. Bryan; schools at Newbridge Lane, Stockport, Cheers and Smith; schools at Greek Street, Stockport, Cheers and Smith; Love Street Schools, Chester; Gravesend Borough Council Schools, J. J. Robson; Wimbledon Education Council Schools, H. P. B. Downing; Rotherham Schools for Education Committee, Holdgate and Harrison; Uphall Road Schools, Ilford Education Committee, C. J. Dawson; etc., etc.

THE GILMOUR DOOR CO., LTD., 51, BERNERS STREET, LONDON, W. STAND 67. ROW D.

The prinicpal exhibit of this company is their patent revolving door, which is quite new. In the construction of the wings an innovation has been introduced, in that the door is a "two-way" one, leaving ample room for each person. At a time of panic due to fire or other cause, a pair of doors dividing the wings open under pressure, the action being identical with that required by the London County Council for fire-door exits in public buildings. In addition to these features, the wings automatically swing back into the circular sides. The door now being shown is to be installed in the entrance of the new Strand Hotel.

The Gilmour hardwood veneered door and hospital door are built up with a core of Canadian yellow pine, and heavy steam-heated rollers are used for rolling on the glued veneer.

The Gilmour hardwood veneered door is built up on scientific principles so as to counteract any possible warping, twisting, splitting, shinking, or blistering. The hardwood facing is dried with steam-heated air, the steam being used to keep the pores of the wood open, and preventing the wood becoming brittle, and enabling same to be thoroughly and perfectly dried from the centre outwards. The facing in all cases is again tested by actually measuring a portion and placing same in 200 degrees of heat for a short time, and on being again measured, and found not to have shrunk, it is considered dry and ready for use. Heavy steam-heated rollers are used to roll on the hardwood face to core, so that the surplus glue is rolled out through the grooves, and only sufficient allowed to remain to bring wood and wood together and form a perfectly welded joint.

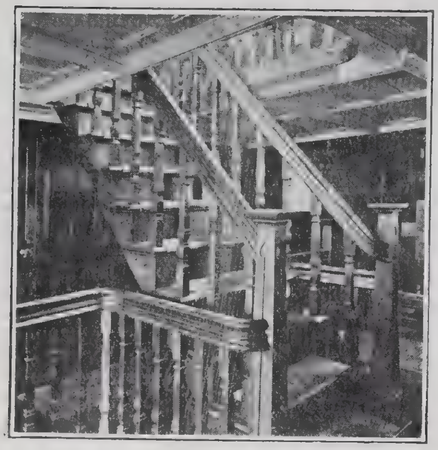
The hospital door is a separate patent, with an absolutely flush surface both sides. It is flat veneered. The core is built up entirely of ⅞-in. pieces of Canadian yellow pine (the most unwindable of softwoods) laid both vertically and horizontally, and always grain against grain throughout. The core is combined with oak dowels. Any hardwood is veneered thereon to order.

Each Gilmour hardwood veneered door is guaranteed against winding, warping, shrinking, shaking, or blistering, and, owing to its being veneered, only the primest stuff is used, and it shows that desirable figure which is often hidden up inside the solid door.

A list of a few of the public buildings to which during the past four years doors have been supplied can be obtained from the firm's stand.

The point on which particular emphasis is laid is that, as mentioned above, the Gilmour anti-cyclone door embodies a totally new method of treatment in the construction of the wings, as a two-way door, thus leaving plenty of room for each person, while for exit in case of fire a pair of doors dividing the wings open under pressure, as required by the London County Council.

H. C. GOODWIN AND SON, 16, CHARLES STREET, HATTON GARDEN, LONDON, E.C. STAND 61. ROW W



Messrs. Goodwin and Son have an extensive display of joinery executed at their works, including stock doors, mouldings, balusters, newels, etc. This firm has carried out some high-class work from architects' designs, and photographs of some of them are on view. An example of good finish is the staircase for the surveying yacht "Galatea," which is here illustrated.

The stock doors are slightly in advance of the usual type as regards design, but architects will expect a further improvement before they will specify them to any extent. This is a point which manufacturers will be wise to consider.

The many uses to which Compoboard can be put for interior work are demonstrated at this stand.

Joinery has been executed from the designs of the following architects:—J. Simpson, Buxton; Messrs. S. Harrison and Sons, Leicester; J. W. Start, Colchester; C. R. Ross, Long Eaton; H. Reed, Exeter; J. Newman, Sandown, I.W.; Messrs. Hooper and Nash, Gerrard's Cross; Messrs. White, Son and Pill, Barnet; F. Shaw, Drogheda; W. G. Lower, Guildford; W. C. Jackson, Chesterfield; J. W. Pate, Cambridge; Messrs. Caddy and Ball, Mackins Hey, Liverpool; Messrs. Friend and Lloyd, Aldershot; C. W. Calcott, London; T. Moody, London; T. M. Garrood, London. Messrs. Still, Wheat and Luker, London; A. Burr, London; C. Burton, London; Messrs. Crickmay and Sons, London; C. F. Doll, London; Messrs. Searle and Searle, London; C. W. Reeves, London; J. O. Kyn, Cairo; Drill Hall at Blackheath, architects, Messrs. T. Dinwiddy and Sons, London; Naval Establishment, Shotley Point, Ipswich, T. C. Agutter, civil engineer.

HÖFLER, LTD., 26a, SOHO SQUARE, LONDON, W. STANDS 83 AND 84. ROW E.

Messrs. Höfler exhibit some well executed metal and joinery work at their stands, in addition to their sheet lead damp-course. In regard to the metal work, special note should be made of a pair of wrought and polished iron gates, designed in accordance with the "Adam" tradition, and intended as a specimen of the standard of work and finish done at "The Chiswick Forge."

An ambitiously designed chimney piece (in the "Georgian" manner), which exhibits some very skilful craftsmanship in its execution, is also on show, as also are many examples of Austrian oak panelling and inexpensive Austrian oak chimney pieces, and a small staircase with wrought iron balustrading on one side and polished steel bronze on the other. It should be pointed out that this latter is meant as an illustration of the kind of work which the firm is capable of turning out.

On the same stand are also shown, in addition to samples of Austrian oak panelling, of joinery and carving, and of parqueterie, specimens of "Durato" asbestos flooring, which is jointless, fireproof, and damp-proof.

The following is a list of buildings (with their architects) for which this firm has executed work: New Midland Hotel, Manchester, Charles Trubshaw; Imperial Hotel, Russell Square, Chas. Fitzroy Doll; hall and staircase, house near Doncaster, Yorks., G. F. S. Streatfield; Cranston's Kenilworth Hotel, Geo. Waymouth; executive block, St. Thomas's Hospital, Percival Currey; Royal Hotel, Matlock Bath, F. W. Hodge; panelled rooms, near Hull, Runton and Barry; cedar wood room, Cornbury Park, John Belcher, R.A.; carved oak and gilt reredos, Farm Street Church and St. Michael's Church, Brighton, Romaine-Walker and Besant.

INGRAM, PERKINS AND CO., 37, BEECH STREET, BARBICAN, E.C. STAND 163. WALL SPACE.

Recent alarmist reports as to the probable ultimate exhaustion of the world's timber supply will probably serve, if one happens to think of them at the moment, to increase rather than to diminish interest in the exhibition of some of the most beautiful specimens of hard woods that the world can produce. Long may it be before such handsome specimens are jealously guarded in museums as relics of an extinct material.

This exhibit, though primarily interesting to those connected with the timber trade, should, on general grounds, prove equally so to architects, who, as a rule, are content to take a good deal of their knowledge of woods at second-hand. At this stand are to be seen fine selections of conveniently displayed hard and soft woods, comprising a large proportion of those more generally used for building purposes, with the exception of fancy woods. The peculiarities of growth, texture, and figure, and the wonderful contrasts which occur in different kinds of timber are particularly well illustrated in the series brought together by this firm.

Mahogany, teak, maple, American and English oak, stock joinery, compo-board, etc., etc., form the bulk of this exhibit, which has the additional interest of being that of a firm whose establishment dates back to 1797. Particulars of the buildings in which timber supplied by the firm are to be found are not easily procurable, as the business is a wholesale one, but it may be mentioned that Messrs. Ingram, Perkins and Co. enter into large contracts with H.M. Government, the London County Council, the Corporations of the Cities of London and Westminster, most of the Metropolitan Borough Councils, and a number of the County Councils and County Boroughs.

JAMES LATHAM, LTD., 124, CURTAIN ROAD, E.C. STAND 260. ROW R.

On this stand are shown samples of finely figured mahogany from Cuba, Tobasco, Honduras, Mexico, and other districts; oak from Austria, Russia, and America; walnut from America and Italy; satinwood from Ceylon; teak from India, Java, and Siam; Kauri pine from New Zealand; maple and pine from Canada; etc., etc.

The firm also handle large quantities of high-class home-grown timber, such as oak, walnut, beech, sycamore, and brown oak, etc., and of these they show some remarkably fine examples, which in view of the scheme of afforestation recently recommended to Parliament, should be particularly interesting. The sample of English oak is from a tree which, at a height of 6ft. from the ground, had a diameter of 4ft., and was from 250 to 300 years old. The walnut is about 150 years old, and the brown oak sample about 700 years old. Messrs. Latham inform us that they recently handled a parcel of this latter wood from trees which formed part of a well-known avenue in the Midlands, which is mentioned in Doomsday Book as being a well-grown plantation then, so the wood must have been at least 1,100 years old.

Mouldings, floorings, handrails, etc., in mahogany, oak, teak, and American whitewood form a strong feature of this exhibit. They are of good design and excellently machined.

A fine collection of hardwoods is exhibited in the representative samples of veneers, both sawn and knife-cut, which are shown. They illustrate many wonderful vagaries of nature. For interior decoration, these should be of especial interest to all engaged in the production of high-class joinery.

Among the most attractive features of the stand, are actual specimens growing in pots, of many of the woods used in the trade, such as oak, walnut, ash beech, maple, pine, and the rest.

PEMBERTON, ARBER AND CAREY, GRAY'S INN PASSAGE, BEDFORD ROW, LONDON, W.C. STAND 89. ROW F.

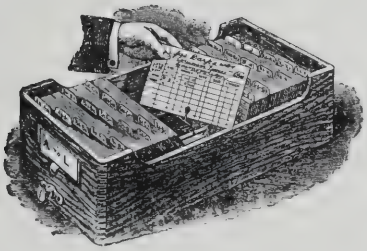
This exhibit is a very clever invention, and is shown by a full-size model of the "Sesame" door, which opens itself when a person steps on the mat in front of it, and closes itself after he has passed through the doorway. The mechanism controlling the movement of the door—which is double, and each leaf pivot balanced—is concealed beneath the floor, in a space which has to be 6ft. 6in. long by 8½in. deep. This, of course, presents no difficulty in a new building, but such a requirement might render inconvenient its adoption in many existing ones.

The invention is quite a new one, and since the success it attained in its early stages, has now been further improved. Architects will find this exhibit one of particular interest.

The following architects have specified "Sesame" doors:—Ambrose Poynter, Esq., F.R.I.B.A.; Lewis Solomon, Esq., F.R.I.B.A.; Messrs. Charles Heathcote and Sons, of Manchester; Messrs. Edward Boardman and Sons; and Messrs. Morgan and Buckingham, both of Norwich; F. Lindus Forge, Esq., 28, Martin's Lane, Cannon Street, E.C.

List of "Sesame" doors installed:—Messrs. Aspreys, silversmiths, etc., 165, New Bond Street, W.; Messrs. Story and Triggs, house furnishers, 152-156, Queen Victoria Street, E.C.; Messrs. A. W. Pettit, drapers, 192-195, High Street, Kensington, W.; Messrs. Marshall's School of Cookery, Mortimer Street, W.; Messrs. Boots, Ltd., cash chemists, King Street, Great Yarmouth; Messrs. Frank Bentall and Co., drapers, Kingston-on-Thames; Messrs. David Cohen and Co., merchants, 17, Tokenhouse Yard, E.C.; Messrs. The Comptoir Nationale Bank, bankers, Franco-British Exhibition; Messrs. Moon and Sons, pianoforte merchants, Plymouth; Messrs. Handleys, Ltd., drapers, Southsea; etc., etc.

THE SHANNON, LTD., ROPEMAKER STREET, LONDON, E.C. STAND 13. ROW A.



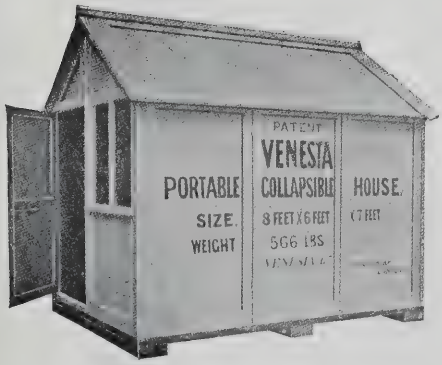
The employment of the shorthand clerk and the typist, while facilitating the transaction of business, has undoubtedly led to a vast increase in the accumulation of documents; and their disposal in convenient compass for ready reference, has been the particular study of this firm for many years.

At this stand may be seen specimens of every kind of office fitments made by the Shannon, Limited, which undertakes the complete equipment in this respect of business premises of all kinds. A special feature is the steel cabinet for the protection of valuable papers in offices.

The dominating principle of the Shannon system is the sectional idea, by which filing cabinets are made up of separate units, procured as present requirements necessitate, and added to when future needs have to be met.

The following is a list of some of the buildings in which their specialities have been supplied: Agricultural Bank of Egypt, Cairo; Anglo-Egyptian Bank, Ltd., London, Cairo, and several branches; Anglo-French Exploration Co., Salisbury House, E.C.; Hon. W. W. Astor, Victoria Embankment, S.W.; Barclay and Co., Great Yarmouth; Barry Dock Railway Co., Barry Docks; Barry, Head and Co., Cannon Street, E.C.; Battersea Borough Council; Ben Lassim and Co., Cairo; Berkleys, Ltd., Victoria Street (shop fittings); Birkbeck Bank, Chancery Lane, W.C.; British Westinghouse Co., Manchester; British Uralite Co., Hale End; Broadbent and Co., Huddersfield; Callender's Cable Co., Victoria Embankment, S.W.; Christie and Co., Ltd., Hoddesdon; City of London Contract Corporation; W. Clarke and Sons, Lincoln; Close Bros., Basildon House; etc., etc.

VENESTA, LTD., 20, EASTCHEAP, LONDON, E.C. STAND 60. ROW D.



This firm exhibit patent waterproof ply Venesta boards for door panels and decorative panelling. The system of construction —thin sheets of perfectly dry wood united with patent waterproof cement—prevents cracking or shrinking, and it is claimed that damp buildings do not injure them.

These boards can be supplied (from 3 to 7 ply) in sizes up to 5ft. by 15ft. without a joint, and ⅛in. to 1in. in thickness. They have been extensively used for tramcar roofs, sides, and seats, and also for cabin partitions on steamships.

Architects should note that this material can be obtained with a veneer of oak, mahogany, walnut, teak, or birch.

The large sizes and widths in which these boards can be made renders it possible to construct doors and panels in designs which are not practicable with timber of ordinary widths. It is obvious that a substantial saving in mouldings and in the labour of construction may be effected by the use of these large panels.

Another advantage is that the patent Venesta three-ply boards are ready for use immediately on delivery, so that they never assume the formidable character of capital lying idle in large stocks whilst wood is seasoning.

THE VAN KANNEL REVOLVING DOOR CO., LTD., 5, BEDFORD ROW, LONDON, W.C. STAND 53. ROW C.

The growing popularity of revolving doors for public and other buildings has made their further improvement inevitable. At this stand the Van Kannel Revolving Door Co. has on show one of an entirely new form, specially designed to ensure the safety of the public in the event of a panic occurring in a large building, and so constructed that sudden pressure on the part of a crowd rushing towards the exit will instantly and automatically cause it to collapse, no matter in what position the wings may be in at the time. These are made to fold neatly together like a fan, and segments of the circular casing can also be made to collapse outwards. From the collapsed position the whole door can be made to assume its original revolving position in a few seconds.

The following is a list of buildings (with their architects), where the Van Kannel doors have been installed: H.M. Office of Works (G.P.O. London); H.M. War Department (Royal Army Clothing Department, Pimlico); Victoria and Albert Museum, Sir Aston Webb, R.A.; Fownes Glove Factory, Gresham Street, E.C., Harvey Dyball; Brompton Oratory, South Kensington, S.W.; Ritz Hotel, Piccadilly, Mewes and Davis; Carlton Hotel, Haymarket, S.W.; Waldorf Hotel, Aldwych, W.C., A. Marshall Mackenzie and Son, A.R.S.A.; Standard Bank of South Africa, Clements Lane, E.C., Meakin and Archer; London Joint Stock Bank, Paddington, W., R. Creese Harrison; "Morning Post" Offices, Strand, W.C., Mewès and Davis; "Daily News" Offices, Bouverie Street, E.C.; White Star Line Offices, Cockspur Street, H. L. Tanner, jun.; the Cunard Line Offices, Liverpool; the Booth Line Offices, Liverpool, Willink and Thickness; the Mersey Dock and Harbour Board Offices, Liverpool; etc., etc.

JOHN P. WHITE, THE PYGHTLE WORKS, BEDFORD, AND 134, NEW BOND STREET, LONDON, W. STAND 77. ROW E.

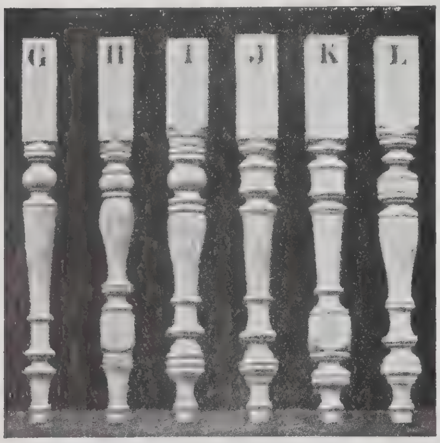
This is a very interesting exhibit, and shows in a varied and representative manner the general excellence of the work executed by this firm. Mr. White's entrance and wicket gates are well known to architects, who appreciate their simplicity and appropriateness of design. Quarter full-size models of these, complete in every essential detail, are on view. Examples of the several kinds of English oak, cut in various ways, and in different stages of seasoning, are also shown.

The attention of architects is drawn to the collection of "stock" hardwood doors, made of best Austrian wainscot in a very solid and substantial manner, and guaranteed not to shrink or warp.

Photographs and drawings of executed work. consisting of general joinery, panelling, staircases, etc., are hung on the stand, which itself is a specimen of treillage.

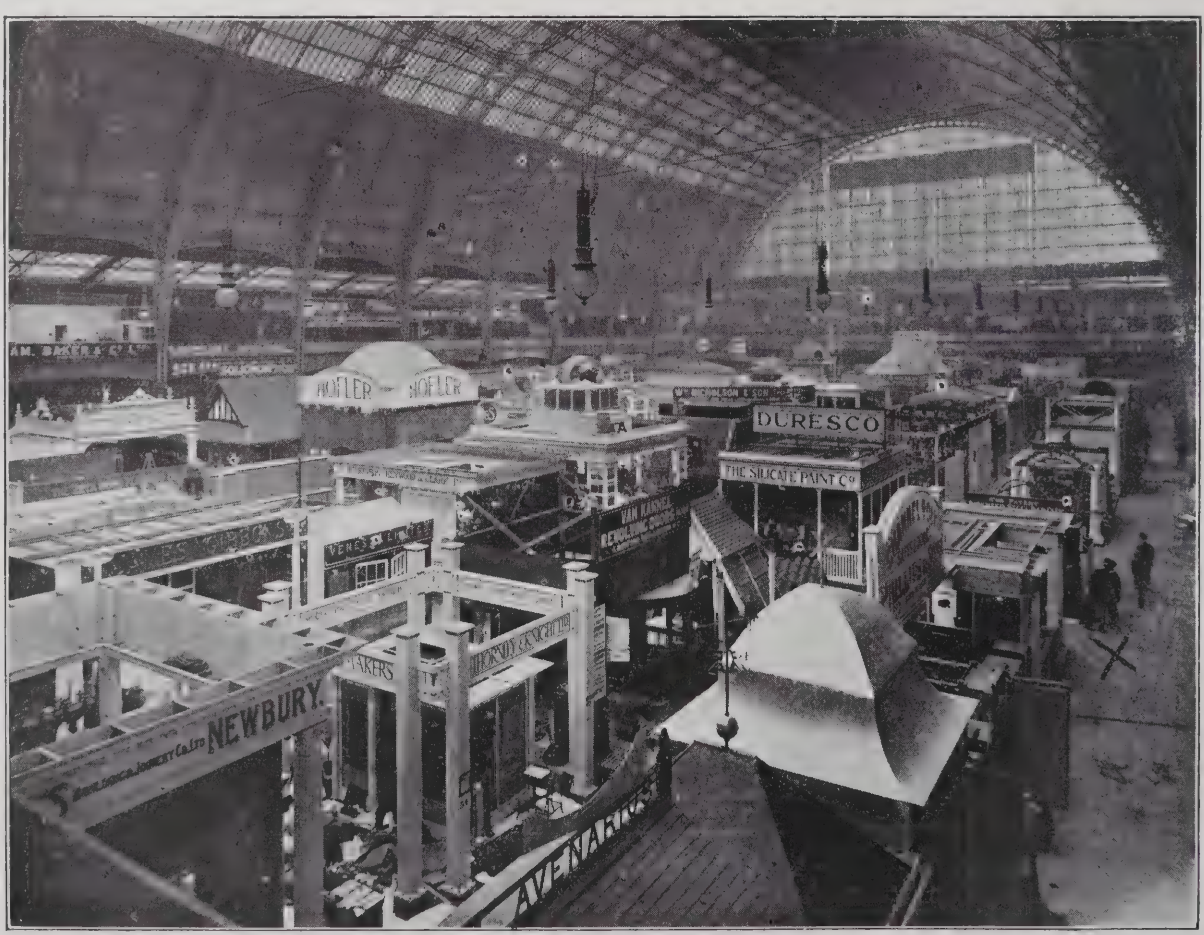
Contracts for woodwork have been carried out at the following buildings:—Ditton Place, Balcombe, Smith and Brewer, architects; Brockhampton Park, Gloucester, G. W. Atkinson, architect; Swinton Park, Yorkshire, Jas. Ledingham, architect; Cornbury Park, Oxon, John Belcher, architect; Stapleford Park, Leicester, C. E. Mallows, architect; Polesden Lacey, Dorking, Ambrose Poynter, architect; Blakesley Hall, Northants, Law and Harris, architects; Abbess Grange, Hants., Bannister, Fletcher and Sons, architects; Sutton Place, Guildford, Ambrose Poynter, architect; Hatley Park, Gamlingay, R. W. Schultz, architect; Stockport Town Hall, Sir A. Brumwell Thomas, architect; Sunderland and South Shields Water Co.'s offices, W. and R. Milburn, architects; Royal Victoria Infirmary, Newcastle-on-Tyne, Newcombe and Adams, architects; etc., etc.

THE "YOUNG" FIRM (E. C. YOUNG), VIRGINIA ROAD, BETHNAL GREEN, E. STAND 88. ROW E.



This exhibit consists of a model room panelled throughout with oak framing and 3-ply panelling, in which are shown samples of the many specialities manufactured by this firm, such as turnery of every description, stock mouldings, over-doors, etc. Letters, either of plain wood or gilded, ready for fixing, are also displayed in large variety. Contractors who use stock newels, balusters, handrails, over-doors, fretwork arches etc., will find them all here, of varied design. This firm is introducing especially cheap wood letters, either plain or gilt, ready for fixing. The illustration (here given) represents a few examples of the many specimens of turned work made by the firm, whose range of goods can only be briefly indicated in the limited space allotted for exhibitors' notices.

The really artistic architect is always a connoisseur of woodwork, for he realises very keenly that many of his best effects, both internal and exterior, depend largely upon the treatment of staircases, balconies, dadoes, and so forth, to say nothing of the "fitments, fixtures, and fittings." In every such item of woodwork about a house there is infinite scope for the exercise of taste and skill. Even the cupboards that the ladies so insistently and imperatively desire must nowadays display a considerable departure from mere and absolute plainness; and as for newels, the imagination of those whose pleasing task it is to "turn them to shapes" with a view to giving them "a local habitation" is apt to run riot.

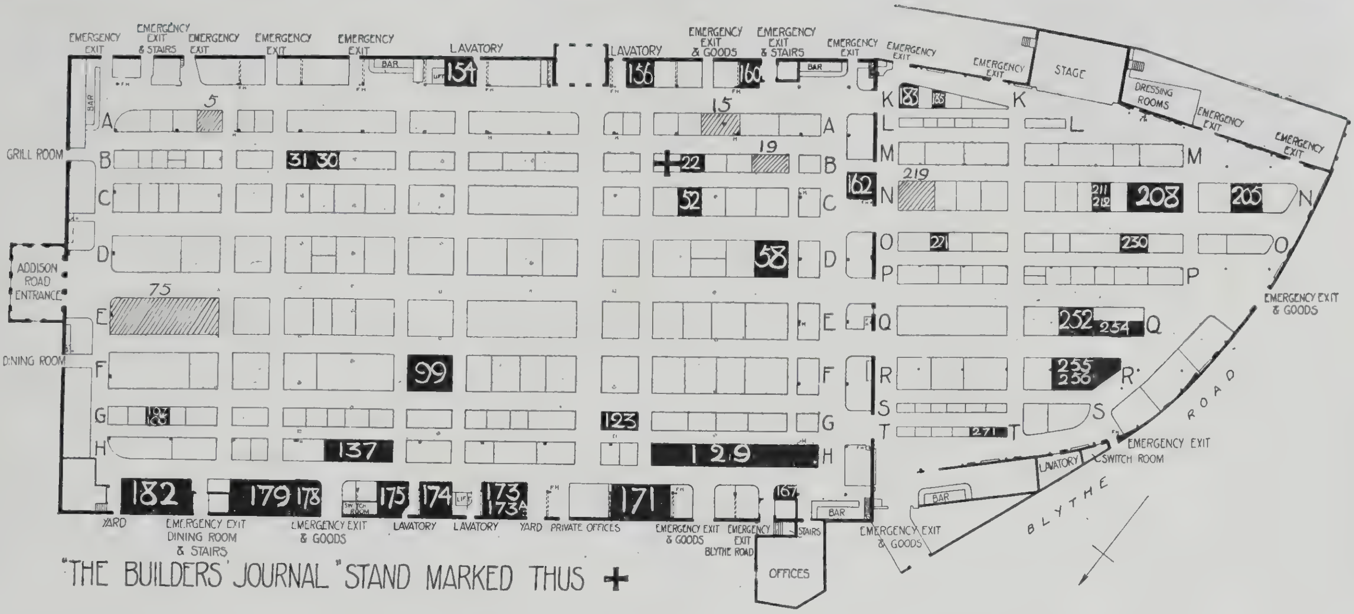


GENERAL VIEW OF THE EXHIBITION FROM THE GALLERY, LOOKING TOWARDS ADDISON ROAD. *Photo: Topical.*

"The Builder's Journal" Stand is indicated by a cross.

SECTION SIX.

Heating. Ventilating. Lighting and Lighting Fixtures. Cooking and Laundry Machinery. Grates and Stoves. Lifts. Strong-rooms. Water Softeners.


EMERGENCY EXIT
EMERGENCY EXIT & STAIRS
LAVATORY
EMERGENCY EXIT & GOODS
STAGE
DRESSING ROOMS
GRILL ROOM
ADDISON ROAD ENTRANCE
DINING ROOM
YARD
EMERGENCY EXIT DINING ROOM & STAIRS
PRIVATE OFFICES
BLYTHE ROAD
OFFICES
BAR
SWITCH ROOM
ROAD
BLYTHE
A B C D E F G H K L M N O P Q R S T
5 15 19 22 30 31 52 58 75 99 123 129 137 154 156 160 162 167 171 173 173A 174 175 178 179 182 183 185 187 188 205 208 211 212 219 221 230 252 254 255 256 271

"THE BUILDERS' JOURNAL" STAND MARKED THUS +

The following firms are noticed under this section, and their stands are blacked in with numbers in white :—

211, 212	N	Atmospheric Steam Heating Co., Ltd, (1907), p. 381.
174	Wall Space	Bell Range and Foundry Co., Ltd., p. 382.
107,108	G	Benham and Sons, p. 382.
167	Wall Space	Boby, William, p. 382.
221	C	Burroughes, W. J., and Co., Ltd., p. 382.
		Candy and Co., Ltd., p. 383.
		Carron Co., (The), p. 383.
182	Wall Space	Coalbrookdale, Ltd., p. 383.
252	Q	Crittall, Richard, and Co., p. 383.
179	Wall Space	Eagle Range and Gas Stove Co., p. 384.
183	K	Fenlon and Son, p. 384.
208	N	Glover-Lyon Ventilation Co., Ltd., p. 384.
123	G	Hartley and Sugden, Ltd., p. 384.
160	Wall Space	"Loco" Vapour Gas Light Co., Ltd., p. 385.
175	Wall Space	London Warming and Ventilating Co., Ltd., p. 385.
30	B	Medway's Safety Lift Co., p. 385.
162	Wall Space	Matthews and Yates, p. 385.
156	Wall Space	Non-Explosive Gas Co., Ltd., (The), p. 386.
[illegible]	[illegible]	Phillips and Son, p. 386.
205	N	Phillips, F. and Son, p. 386.
31	B	Potterton, Thomas, p. 386.
154	Wall Space	Praed Patent Safety Gas Light Co., Ltd., p. 387.
171	Wall Space	Smith and Wellstood, Ltd., p. 387.
52	C	Smoke Consumption, Ltd., p. 387.
137	H	Standard Range and Foundry Co, Ltd., p. 387.
		Thursfield and Co., p. 388.
173	Wall Space	Teale Fireplace Co., (The), p. 388.
		Titan Lift and Electric Co., (The), p. 388.
		Tredegar and Co., p. 388.
58	D	Waygood, R., and Co., Ltd., p. 389.
		Werner, Pfleiderer and Perkins, Ltd., p. 389.
185	K	Wright, E. G., p. 389.
254	Q	Yates, Haywood and Co., Ltd., p. 389.

REFERENCES.

The following firms are noticed in other sections, but are showing exhibits connected with this one. Their stands are indicated by hatching :—

75	E	Carter and Co., (Grates and Fires), p. 359.
15	A	North British Plumbing Co., Ltd., (The), (Mitchelite Petrol Air Gas Apparatus), p. 395.
[illegible]	B	Peters, C. A., Ltd., (Carbotron Stoves and Fuel), p. 399.
5	(A Bay 27, Gallery)	Webb Lamp Co., Ltd., (The), (Webb's Self-intensifying Gas Burner), p. 396.
19	N	Woolliscroft, G., and Son, Ltd., (Slow Combustion and Anthracite Fires), p. 367.

THE ATMOSPHERIC STEAM HEATING CO., LTD. (1907), 52, GRAY'S INN ROAD, HOLBORN, W.C.

STANDS 211 AND 212. ROW N.

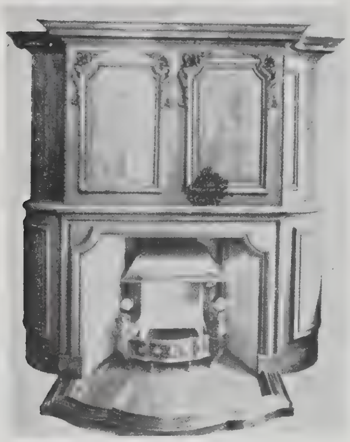
The atmospheric system of steam heating provides the means by which steam can be circulated without initial pressure, independently of the length of mains. The circulation is not forced, but induced, by partially exhausting by means of a vacuum pump, all mains, radiators, etc., in advance of admitting the steam. In this system the two troublesome obstructions to free circulation—namely, air-binding, and inefficient drainage of the water of condensation—are non-existent, the extraction of air and water being automatic and continuous; and, by the same process, water-hammer and the damage it produces by causing leaky joints, become impossible. Other advantages claimed are: thorough effectiveness of the radiating surfaces, reduction in sizes of mains, economy in fuel and maintenance, and control of the distribution and volume of the steam circulated. The system obviously admits of the utilisation of exhaust steam without back pressure on the engines, the exhaust steam flowing into the heating system more freely than into the atmosphere direct.

The "National" system of automatic temperature control, of which this firm are the sole licensees in Great Britain, includes a thermostat that is sensitive to a change of even one degree of temperature, and a motor that gives effect to any alteration that is felt by the thermostat; the motive power being air, for which the compressors are actuated by steam or hydraulic power. By this means the uniformity of temperature that is of vital importance in hospitals, for instance, is automatically kept constant.

The Webster "Star Vacuum" feed-water heater, purifier, filter, and receiver, and several other specialities that appeal to engineering interests, are also shown, as well as a boiler showing the arrangement adopted for the "Beck" rapid circulation hot-water system.

The Government and municipal buildings, hospitals, asylums, workhouses, and educational and business premises in which the atmospheric system of steam heating has been installed make a long list, from which a few selections only can be here given, namely: Imperial Institute (London University), Royal College of Science, and Victoria and Albert Museum, all at South Kensington; the Royal Courts of Justice; etc., etc.

BELL RANGE AND FOUNDRY CO., LTD., 70, MORTIMER STREET, LONDON, W., AND WEST BRIDGE WORKS, NORTHAMPTON. STAND 174. WALL SPACE.



This firm has placed its grates in appropriate "surrounds." There is a 12ft. inglenook, with marble surround to grate, and marble shelf, with a "Bell patent dog grate" in action. Another such grate is filled with a finely carved Elizabethan oak mantel. A Jacobean oak mantel enshrines a basket fire grate "in rough armour bright, and with marble panels." There are also some specially designed examples of white wood mantels, fitted with Bell basket fire grates.

Bell's patent dog grates are not to be confounded with the old-fashioned sort. The new grates are constructed to double the heating capacity with half the consumption of fuel, while the hearth is kept perpetually clean without any necessity for sweeping. The grates represent the best patterns of several different periods.

The Bell boiler for domestic hot water aims at supplying an almost unlimited quantity of water at merely nominal cost in fuel consumption.

The following is a list of a few of the buildings (with their architects) where this firm's goods are in use:—Bromham House, Bedford (G. P. Allen); Russley Park (R. T. Beckett); "Ashlawn," Rugby (J. D. Hoper); Belton Hall, Rutland (Talbot, Brown and Fisher); St. Wilfrid's, Portsmouth (J. T. Blackwell); Earl's Barton Grange (Talbot, Brown and Fisher); New Houses, Bournemouth (J. H. Brewerton, F.R.I.B.A.); Weston Favell House, Northampton (C. Dorman and Son); Patishall House (H. O. Tarbolton); Ber House, Norwish; Clapton Manor, Oundle (Gotch and Saunders); Hotel Cameron, Swansea (C. T. Ruthen); Northampton General Hospital (F. Dorman); Crawford Arms Hotel, Wolverton (C. V. Cable); Rushton Hall (Gotch and Saunders); Albany Hotel, Hastings; Savoy Hotel, London; Charlton House, Kent; Junior United Service Club, London; 15, Princes Gardens, S.W.; 48, Onslow Gardens, S.W.; etc., etc.

BENHAM AND SONS, LTD., 66, WIGMORE STREET, LONDON, W. STANDS 107 AND 108. ROW G.

Messrs. Benham and Sons, the well-known makers of cooking apparatus, kitchen ranges, hot-water boilers, and cylinders, etc., exhibit at this stand a selection from among their very numerous specialities, among which may be particularly noticed their coal-fired central hot-plate (10ft. long by 5ft. wide). This is constructed with a descending flue and a fire and two ovens on each side, making two fires and four ovens in all, and has heavy cast-iron top metal, and a guard rail on each side. Other improvements, such as the construction of the body and ovens in mild steel, are embodied in this apparatus, which will interest those whose business it is to advise on the cooking equipment of large institutions, hotels, etc.

The "Wigmore" kitchener is represented by one of 5ft. 6ins. in length, having tiled covings, and a roasting fire fitted with vertical bars, which are removable. It also has two large ventilated ovens for baking and roasting, and a hot closet overhead fitted with revolving doors.

The company also exhibits a 4ft. "Welbeck House" kitchener, similar in all respects to those supplied for all the flats at Welbeck House, Welbeck Street, W. The points to be noticed are the rising fire, fitted with movable bars, the open and close fire arrangement, the two ventilated ovens, and white tiled covings.

A very useful fitting for potatoes, puddings, fish, etc., is the three-compartment wet steam oven. Each compartment is fitted with perforated galvanised trays, and is capable of being worked independently. Special steam tight doors with screw-wheel fastenings are included.

The "Wigmore" independent hot-water system is also exhibited, and comprises a specially constructed wrought welded boiler, a galvanised steel circulating cylinder, with circulating pipes, safety valve, emptying cock, etc.

WILLIAM BOBY, SALISBURY HOUSE, LONDON, E.C. STAND 167. WALL SPACE.

This firm makes a speciality of water-softening appliances, of which type "K"—for domestic service—calls for particular note, as being the outcome of very wide experience in this class of machine.

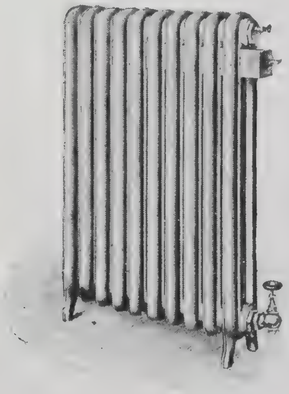
The softening material is a fine powder, which is deposited into a receptacle with a lid, and in the standard types of machines no attention is necessary for weeks at a time. If required, the time can be made to extend to a period of two months.

The "Simplex" water softener is capable of dealing with from 100 gallons per hour, upwards. In this appliance the mechanism is automatic, always in sight and above water, making inspection a simple matter.

As a remedy against the choking of hot-water pipes and apparatus in hard-water districts, these machines should prove of value.

The following is a list of some of the buildings at which these appliances have been fitted:—Dromoland Castle, Co. Clare, Ireland, for Lord Inchiquin; house at Kingswood, Surrey, Mr. Cowlishaw, architect; house near Newbury, Berks., Mr. Kirk, architect; the New Strand Hotel, London, Mr. Ancell, architect; the Savoy Hotel; University College Medical School, Gower Street, Mr. Waterhouse, architect; Isolation Hospital, Dartford, Kent; The Infirmary, City of London Union, Homerton; Lincoln County Asylum, Lincoln, W. Watkins and Sons, architects; The Devon and Exeter Hospital, Fulham Infirmary, Radcliffe Infirmary, Oxford; Northwood Sanatorium, Ivanhoe Hotel, London; business premises (Messrs. D. H. Evans and Sons), Oxford Street; Woolwich Arsenal; Chatham Dockyard; The Admiralty, Chatham Dockyard, 3 machines; the War Office, the Crown Agents for the Colonies; Dewrance and Co., London; Crown Laundry, Fulham; Achille Serre, Ltd., Hackney Wick, 2 machines; etc., etc.

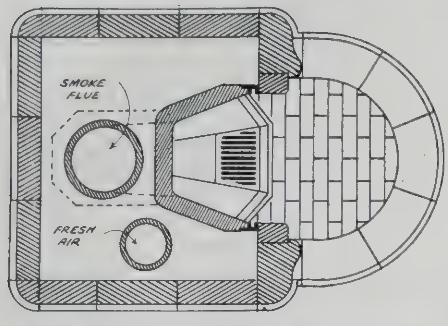
W. J. BURROUGHES AND SONS, 143, QUEEN VICTORIA STREET, LONDON, E.C. STAND 221. ROW O.



In the "Ideal" low-pressure hot-water system of heating, the boiler is made with the latest devices for self-regulation, and has a fuel capacity which enables it to run from ten to twelve hours without attention. The radiators, which constitute the sole exhibit of Messrs. Burroughes and Sons, are made in sections, and if found desirable at any time to alter their size, by reason of the enlargement of the room, one or more sections may be added. In the company's new patent radiator the vapourising pan is placed entirely on the inside of the radiator, and is consequently out of sight; but having no fixed parts it can be taken out like a table drawer, and on account of its close contact with the heated surface, the maximum amount of evaporation is obtained.

Messrs. Burroughes and Sons have executed contracts for the following:—Higher Broughton Synagogue, Manchester; Congregational Church, Chertsey; Schools, Heston and Isleworth U.D.C. Education Committee, Heston; Kent House College, Penge, S.E.; Kentish Town Parish Church; St. Andrew's Church, Fulham; St. Peter's Church, Tooting; St. Mary's Church, Bletchworth; Jewish Synagogues at Hampstead, Stoke Newington, New Cross, Brondesbury, and Finsbury Park; Neola Piano and Player Co., 94, Regent Street, W.; Bon., Ltd., Streatley House, Piccadilly, W.; Hanbury, Tomsett and Co. (Electric Press), Kensal Rise, N.W.; "Egypt House," 36, 37, and 38, New Broad Street, E.C.; Roneo, Ltd., 26, Holborn Viaduct, E.C.; Central London Throat and Ear Hospital, Gray's Inn Road, W.C.; Bryant and May, Ltd., Fairfield Works, Bow, E.; Council Buildings, Aldershot; Kodak, Ltd.; Read Bros., Ltd.; Raphael Tuck and Sons, Ltd., Moorfields, E.C.; Capital and Counties Bank, Tunbridge Wells; etc.

CANDY AND CO., LTD., 87, NEWMAN STREET, LONDON, W. STAND 99. ROW F AND STAND 178. WALL SPACE.



PLAN OF SINGLE CENTRAL WARD STOVE WITH DEVON No3 RAISED FIRE.

The most conspicuous exhibit at this stand is a new hospital stove, which Messrs. Candy and Co. are introducing for the first time. It has a good appearance, has been very carefully thought out, and possesses features which should commend themselves to those interested in hospital equipment. In order to obviate the taking down of the entire stove when the back requires to be renewed, there are two small pieces of faience in the front whose removal facilitates any repairing work. The blower, too, which is so important a part of a ward stove, works in two ratchets fixed between the fireback and the faience front. Another improvement consists in the substitution of a shaped piece of firebrick at the bend of the fire-back top, for the ordinary concrete finish, which is liable to work loose, and so become injured in sweeping the flue.

Among the firm's other interesting exhibits should be noted a new application of their well-known "Devon" fire to existing hearths.

The following are a few of the buildings (with their architects), in which Messrs. Candy's fires have been used:—Houses at Brancote Road, Oxton, Birkenhead, Herbert Story; houses at Heswall Hill, Cheshire, and new residences at Burrell Hill, Burrell Road, Prenton, Cheshire, A. W. Street; City Buildings, Liverpool, F. G. Fraser; new High Schools, Wallasey, Appleyard and Quiggin; new house, Brancote Road, Oxton, Birkenhead, E. C. Aldridge; Wallasey U.D.C., Public Offices, W. H. Travers; new offices, Seacombe, Cheshire, Harris and Hobson; Toxteth Technical Institute, for Liverpool Corporation; new residences at Upton, near Birkenhead, W. A. Thomas; public baths, Seacombe, Cheshire, W. H. Travers; house at Telegraph Road, Heswell, near Birkenhead, A. Gilbertston; Children's Home, Formby, J. J. Havelock Sutton; etc.

THE CARRON CO., CARRON WAREHOUSE, 15, UPPER THAMES STREET, LONDON, E.C. STAND 129. ROW H.

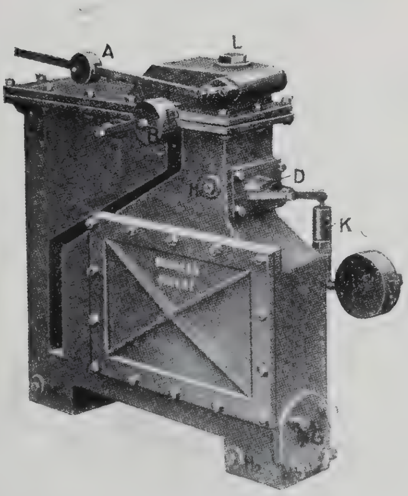
British ironworkers have always easily maintained supremacy over the workers in this material in all other countries, and there seems to be every probability that they will worthily maintain this honourable distinction until there is not left with us sufficient fuel to feed the forge withal. Perhaps it is not flattering our national pride overmuch to assume that in this superiority there is a certain consistency with the strength and determination of the national character. We delight in overcoming the stubbornness of an intractable material, and in shaping it to our will.

That strength and beauty may be happily combined is conclusively demonstrated in the exhibits at this stand. The firm justly claim that the firegrates they show will make a potent appeal to all who appreciate artistic and distinctive home decorations.

The designs represent about the best period that such work has known. They are of the eighteenth century, being taken from originals carved at Carron more than a century ago, and represent the work of two unassuming geniuses of this time, William and Henry Haworth, who were students at the Royal Academy during the presidency of Sir Joshua Reynolds. Their work clearly shows that they were true children of the times in which they lived, and that they were strongly influenced by the style of Flaxman, and by the dominating example of the Brothers Adam. The carvings, it is claimed, with perfect justice, are masterpieces of the carver's art, and recall the time when strict attention to detail, combined with ease and grace, was the aim of every artist and craftsman. These fireplaces have been, of course, reconstructed to suit present-day requirements, but in thus adapting them, great care has been taken to preserve the ornamental characteristics in their integrity; but the essential working parts are up to date.

A few baths are also shown.

RICHARD CRITTALL AND CO., 197, WARDOUR STREET, LONDON, W. STAND 252. ROW Q.



The problem of preserving an equable temperature within doors at the season when artificial heating is necessary not only for comfort, but for the preservation of health and even of life, is now mainly difficult by reason of the embarrassment of choice in the matter of heating installations.

This is a matter in which, during the past few years, rapid progress has been made, and the most recent modern developments are well represented at this stand.

The "Cable" system of heating is a low-pressure automatic self-regulating one, by which the water is forcibly circulated (at any desired temperature) without pumps and irrespective of levels. Pipes of large diameter are not required, as they are all of small bore (from ¼in. upwards). Neither is it necessary by this system to excavate for the boiler or form channels for the pipes. Further, wherever the boiler is situated the pipes can be fixed without regard to direction or level.

The pipes and radiators can be automatically heated to any temperature, which may be maintained without the dampers being touched; and, as it is impossible to exceed the desired temperature without altering the regulating lever, no boiling over can result, however hard the boiler is fired. The system may be worked with a boiler pressure as low as 3lbs. per square inch, or with exhaust steam only.

This system is applicable to existing buildings, as the whole apparatus can be installed without undue interference with the structure. The apparatus is shown in actual use at this stand.

The following heating installations have recently been carried out, or are now in course of construction:—Ritz Hotel (extension to heating); Cavalry Club, architects Mewès and Davis; Albemarle Club, architects, Smith and Brewer; District Railway Offices, St. James' Park Station, architect, H. A. Ford; 4, Crosby Square, Arthur Blomfield, M.A., F.R.I.B.A.

THE COALBROOKDALE CO., LTD., COALBROOKDALE, R.S.O., SHROPSHIRE. STAND 182. WALL SPACE.

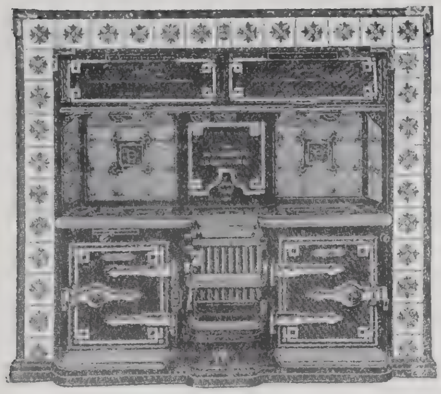
Particular attention is drawn to two specialities exhibited at this stand—the "Tilt" fire, and the "Thrift" range.

The former is so constructed that when first lighted it can be tilted bodily by means of a poker so that the bottom of the fire assumes a sloping position. This action causes the lower half of the back to incline backwards, leaving the upper half in its original position, where it acts as a blower. When the coals are incandescent, it is merely necessary to draw out the canopy and lower the fire again, to make it slow burning.

The "Thrift" portable range possesses novel features throughout its construction. These include a patent fire box, by means of which hot air is supplied to the fire at the back and sides, thus assisting combustion of fuel very materially.

Certain kinds of cheap coal—if any coal can ever be said to be cheap—we mean those classes of coal that are usually regarded as inferior, and are comparatively low in price, such as cobbles and nuts, would often be preferred for domestic consumption if only they were a little more tractable. When once they are fairly alight, they burn much brighter and better than many of the so-called superior coals, and give more heat and less soot; but the difficulty is to get them to start on their brilliant career. As this trouble occurs at exactly the time when it can be endured with least patience—in the morning, when every moment is precious—this consideration determines the choice in favour of a softer and sootier coal, which is a pity. We take it that by means of appliances such as those exhibited at this stand this preliminary objection is entirely overcome, and that therefore the "Tilt" fire and the "Thrift" range make equally for efficiency and economy.

THE EAGLE RANGE AND GAS STOVE CO., LTD., 127, REGENT STREET, LONDON, W.
STAND 179. WALL SPACE.



The "Premier" Gold Medal Eagle range, with tiled covings, patent hat closet canopy, and tiled mantel frame, has all its flues (including the boiler flue) enclosed; and hinged front bars afford convenient access to the boiler flue, or for clearing out the firebox, while the boiler itself can be easily removed from the front, without disturbing the range. There is an improved reversing damper for heating either the bottom or the top of the baking oven—or, if desired, the heat can be directed to both top and bottom simultaneously—and the improved movable bottom grate can be easily raised or lowered with one hand. The draught is indicated and regulated by means of a patent device, while the oven ventilation and the smoke-consuming and soot-eliminating fire-cheeks are of guaranteed efficiency. There is a separate boiler damper. All the wearing parts are interchangeable.

In the New Eagle portable range, the ovens, which are thoroughly ventilated, are exceptionally large for the size of range, and are fitted inside with a revolving meat-hanger. An air-chamber to the over door is formed by an inner sheet, to prevent rapid cooling when the outer door is opened. Bath boilers, with hot closets for worming plates and dishes, are provided with the ranges designated H.P., while those known as O.B. are fitted with low-pressure side boilers. The fire is easily altered from open to close, the bottom grate can be raised or lowered to any required position, and the damper and draught-regulating mechanism is self-indicating. The boilers are of improved construction.

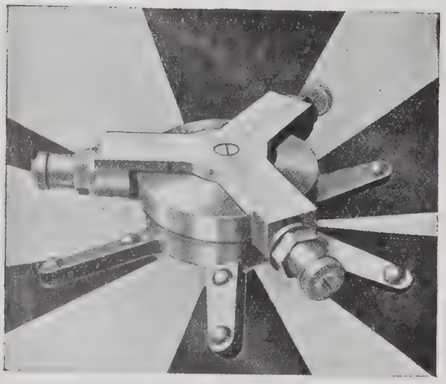
FENLON AND SON (INCORPORATING G. SHREWSBURY AND CO.), TUDOR STREET, LONDON, E.C.
STAND 183. ROW K.

Messrs. Fenlon and Son exhibit a large selection of their geysers, gas baths, gas boilers, etc., among which may be mentioned the following:—The "Tudor," "Fleet," "C.C. Fleet," "Mani-Supply," "Calda" and oil geysers; "City" cast-iron, "Ludgate" porcelain and "Plunge" tinned iron baths; "Excelsior" gas-heated baths; cork bath mats; registered asbestos gas fire burners; "C.C. Fleet" and "Triad" gas-heated circulating boilers for attachment to ordinary hot water pipes from kitchen range; "Unique" and "New Era" self-contained gas or oil-heated radiators with patent safety valves; "Temple" gas-heated hot water apparatus with copper boiler and cast-iron pipes for heating greenhouses, motor houses, etc.; "We-do-get-'ot" and "Ephaness" gas or oil-heated hot water apparatuses; "Reliance," "Nonpareil" and "Registered" gas boilers.

These specialities are the products of the two incorporated firms—Fenlon and Son, and G. Shrewsbury and Co.

It has been interesting to watch the growth of this firm during a series of years. Success has been achieved, we should suppose, mainly as a result of the thorough enthusiasm of the proprietors, who have always taken a keen practical and personal interest in all that pertains to their business, and who are never satisfied until they have succeeded in satisfying the customer. They have taken out many patents, especially for heating apparatus, and in each case the point in which improvement could be effected has become evident as the result of close observation, and one might almost say loving solicitude, Fenlons evidently desiring nothing so much as to render their apparatus as perfect in every respect as anxious study could make it. Hence the firm's "expansion by heat," so to speak, has been well earned.

THE GLOVER-LYON VENTILATION CO., LTD., CAXTON HOUSE, WESTMINSTER, LONDON, S.W.
STAND 208. ROW N.



This exhibit is one which architects should make a special point of inspecting, as practical demonstrations will be given in order to prove the correctness of the theories upon which this system of ventilation depends.

The company has erected a room fitted up with an apparatus which can be seen in action. This room will be filled with smoke, which will in the course of a few minutes be removed and replaced by fresh air introduced at a suitable temperature through numerous specially graduated apertures, without draught. The extraction is effected in a corresponding manner, and the result is that a slow sweep of air passes through the room from end to end or from side to side—as the necessities of the case may dictate. The friction drive, which has recently been introduced, gives greater control over the speed of the fan to which it is attached, and, moreover, enables a smaller motor to be used.

The practical demonstration of the efficiency of the system will doubtless attract a great deal of attention, and it will go much further towards convincing the sceptical than would the clearest and most eloquent exposition of theory; and it leaves no room for doubt as to the soundness of the theory, nor as to the effectiveness in parctice.

Among some of the buildings in which the Glover-Lyon system has been adopted are the following: The University of Cambridge; Farrow's Bank, London; the Royal Society of Medicine; the Bath Club, London; the University Club, Edinburgh, J. M. Dick Peddie, architect; Central Throat Hospital; Criterion Restaurant, London; Colston Hall, Bristol, Hall-Jones and Cummings, architects, etc.

HARTLEY AND SUGDEN, LTD., ATLAS WORKS, HALIFAX. STAND 123. ROW G.

At this stand Messrs. Hartley and Sugden exhibit a selection of their boilers, and attention may be drawn to the "Savile"—for domestic supply or heating apparatus—the "Hospital," the "Villa," "Manor," and "White Rose" boilers.

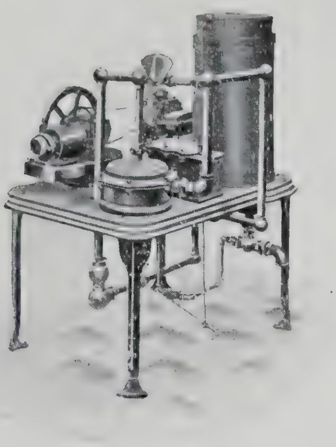
The Chatsworth boiler for heating greenhouses, and four different types of range boilers, are also shown.

The "Effective" and "Dromana" boilers (of wrought iron) for low-pressure steam heating, a series of plain and fluted radiators, are among other specialities made by this firm.

This exhibit comprises every form of boiler which can be required for heating apparatus of whatever pattern or design.

This firm has for many years enjoyed a high reputation for the manufacture of high-class boilers for every conceivable service in connection with heating apparatus. The boilers of this firm are built upon the sectional principle. One hardly looks for elegance in a boiler, efficiency being all that can be reasonably expected of it; and the ordinary ugly boiler is, as a rule, mercifully hidden from the common gaze. Messrs. Hartley and Sugden's boilers, however, are exceptionally handsome, and no special measures need be taken for their concealment. In fact, any one possessing one of these very presentable boilers would be glad to keep it well in sight. Its decidedly patrician appearance strongly recommends it for use—or, rather, explains its extensive adoption in country houses, and for the heating of conservatories and greenhouses.

THE "LOCO" VAPOUR GASLIGHT CO., LTD., 6, ST. ANNE'S PASSAGE, KING STREET, MANCHESTER. STAND 160. WALL SPACE.



At this stand is exhibited the company's "Loco" Air-Gas Machine, which generates the petrol vapour and admixes it with air in the proportions necessary for lighting, heating, and cooking. The problem of lighting country houses or any buildings which are situated at a great distance from a gas works has been in great part solved by the adoption of the petrol-vapour principle, which has much to recommend it, provided that the machine is a safe one. In the case of the "Loco" apparatus, the petrol is stored in a sealed tank outside the machine house, and automatically conveyed into the machine by a small pipe in minimum quantities, by which arrangement it will be seen the question of safety has been very carefully considered. The machine has no soldered joints or needle valve feed, and the petrol is supplied through a mercury regulator.

Orders for "Loco" gas installations have been received from the following :—Stonyhurst College, near Blackburn ; Lord N. C. Stuart, House of Falkland ; C. B. Haworth, Esq., Illawalla, Poulton-le-Fylde ; the Duke of Devonshire, Chatsworth (agent's house) ; J. Grimble Groves, Esq., J.P., Bank Hall ; Commander Hudson, R.N., Frogmore, Ross ; Disley Co-operative Society ; Crewdson Waterhouse, Esq., Prestbury ; Messrs. Fodens, Ltd., Sandbach ; William Challoner, Esq., Blackpool ; Tom Jackson, Esq., Risley Shooting Lodge ; C. B. Craven, Esq., "Westwood," Clayton Green ; Messrs. Bamber Bridge Spinning Co., Ltd. ; Messrs. Wm. Griffiths and Sons (Liverpool), Ltd. ; Pinxton Co-operative Society ; Henry Bratt, Esq., J.P., C.C., Hartford ; Messrs. Pilot Spinning Co., Ltd., Bury. These names, of course, represent only a small selection.

LONDON WARMING AND VENTILATING CO., LTD., 20, NEWMAN STREET, OXFORD STREET, LONDON, W. STAND 175. WALL SPACE.

The smoke nuisance problem would cause but little further trouble if anthracite were more generally used. In this respect it is almost an ideal fuel, and as a heat-giver it is unrivalled, provided you can only get it to burn. Unfortunately it is rather intractable, and is virtually impossible for the ordinary domestic grate. Here, however, we find special provision for the consumption of anthracite ; and the grates and stoves designed with that object in view and here exhibited will be sure to receive the earnest attention of those who are keenly interested in questions of smoke abatement and fuel economy ; but more especially by those architects who are called upon to design houses for districts, either at home or abroad, in which a plentiful supply of anthracite is available. But the goods here shown are not exclusively related to the consumption of anthracite.

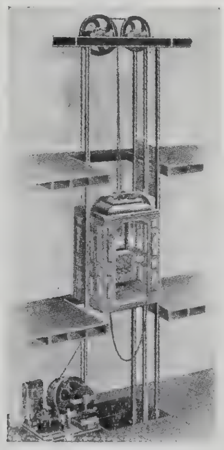
This firm makes a speciality of grates and stoves, chiefly for the consumption of anthracite or smokeless coal.

Attention is drawn to the "Florence" grate, in which a secondary flue (used in conjunction with the ordinary firebrick back) is introduced, which provides the necessary draught to ensure perfect combustion of anthracite. This flue is controlled by an adjustable canopy, which, when shut, seals the principal flue, and brings the secondary one into use. The patentees claim that when ordinary coal is being used the smoke is drawn through the fire to a point where the heat is practically incandescent, by which it is to a large extent consumed.

This stove gained the only medal awarded by "The Coal Smoke Abatement Society," after tests with bituminous or ordinary coal.

Another interesting exhibit is the "Salamandre" stove, similar to those used on board the "Discovery."

MEDWAY'S SAFETY LIFT CO., 10, BUSH LANE, CANNON STREET, LONDON, E.C. STAND 30. ROW B.



This exhibit consists of several examples of lift gear, the principal one being Medway's Electric Passenger Lift Gear, which is entirely self-contained and has a strong cast-iron bed-plate. The winding of the lift is accomplished by means of a spiral-cut drum, or a turned grooved wheel, according to the position of the gearing space. A special feature is the interlocking attachment, which prevents the opening of any gate or door unless the lift is at a standstill in front of it, and in addition does not allow of the lift being moved away from any floor unless all the gates or doors are shut.

The remaining exhibits include Medway's Push-Button Electric Lift, Medway's Silent Self-sustaining Dinner Lift (made in all sizes with single or double cages), and Medway's Patent Safety Gate Apparatus.

The following is a list of some of the customers for whom the company's lifts have been supplied : The Duke of Devonshire, Devonshire House, Piccadilly, W. ; Vickers, Sons, and Maxim, Barrow-in-Furness (2) ; the Royal Mail S.S. Co., Southampton ; the South Eastern and Chatham Railway, Herne Hill, S.E. ; the London County Council, Woolwich, S.E. (2) ; St. Thomas's Hospital, London (3) ; A. B. Markham, M.P., 48, Portland Place, W. ; the Gwalia Hotel, Upper Woburn Place, W.C. ; the Tavistock Hotel, Covent Garden, W.C. ; the General Motor Cab Co., Kennington, S.E. ; Wholesale Co-operative Society, Ltd., Northampton ; J. Sainsbury and Co., Blackfriars, S.E. (2) ; Barrett and Co., Wood Green, N. ; Clarke, Nicholls and Coombes, Hackney Wick, N.E. ; Maynards, Ltd. ; Tottenham, N. ; Batger and Co., Stepney, E. ; Eagle Confectionery Co., Bow, E. ; S. F. Edge, Ltd., 14, New Burlington Street, W. ; Rye and Eyre, 13, Golden Square, W.

It will of course, be understood that this list could be greatly extended.

MATTHEWS AND YATES, LTD., 84, GRAYS INN ROAD, W.C., AND SWINTON, MANCHESTER. STAND 162. WALL SPACE.

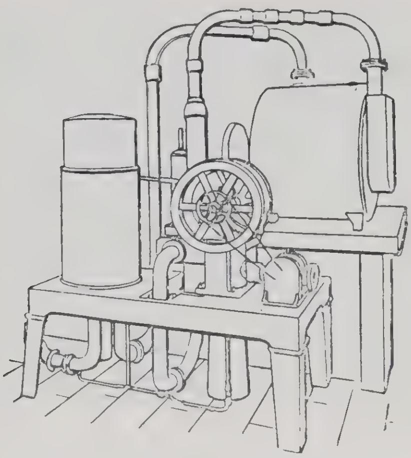
At this firm's stand the section most interesting to builders and those using wood-working machinery is probably the pneumatic collection of the refuse thrown off by the machines, and of this the firm have a small plant at work showing how the refuse is handled. The apparatus consists of a powerful suction fan, to which the machines are connected by means of galvanised iron piping. The fan sucks away the sawdust and chips, and discharges them into a dust separator, so that they are deposited in a heap, and the air passes away to atmosphere.

The firm also show their well-known cyclone fans for ventilating and plenum heating. These are made either belt-driven, steam-driven, or directly driven by electric motors on either continuous or alternating supplies. These fans are in use in most of the public buildings in London and in the Royal palaces.

Along with the fans are their cyclone steel plate blowers and exhausters, made in heavy and light patterns, the former for refuse collecting, induced draught dust collecting, forge blowing, mine ventilating, or any work requiring high pressure and long continuous running, and the latter for ventilating where large volumes of air are required at low pressure.

A few of the buildings in which the cyclone fans and blowers are installed are as follows :—Buckingham Palace, Windsor Castle, Houses of Parliament, Home Office, Somerset House, Royal Mint, Natural History Museum, National Portrait Gallery, Royal Courts of Justice, Custom House, National Physical Laboratory, Patent Office, Scotland House, Brompton new County Court, Westminster County Court, Tower of London, Board of Trade Offices, new War Office, etc., etc.

THE NON-EXPLOSIVE GAS CO., LTD., 85, LONDON WALL, LONDON, E.C. STAND 156. WALL SPACE.



Although the saturation of air with a definite proportion of petrol vapour has been known for fifty years to produce a cheap and efficient medium for lighting and heating, it is only during the last decade that the discovery has been applied to commercial purposes. The great difficulty hitherto found has been the production of a machine which shall be absolutely safe, and it is in this direction that the energies of inventors have been chiefly applied.

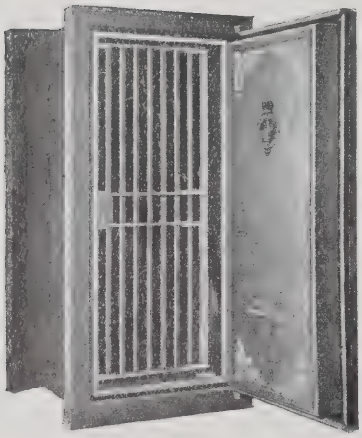
The machine which is manufactured by this company is worked by a hot-air motor and is drawn by a jet of gas placed underneath. The carburettor has no moving parts, and the correct proportioning of the vapour and air is secured by the supply of the latter being controlled by a meter.

Ordinary incandescent mantles (either upright or inverted) may be used with the gas, which gives a brilliant light entirely free from ultra violet rays, which are said to be harmful to the sight.

The firm can produce many references to installations of their system that have given every satisfaction.

Among recent installations laid down by the company are the following:—Perrystone Court, Ross, Herefordshire; Sion House, Chaddesley, Worcestershire; Tara Hall, Tara, Ireland; The Brambles, Iver Heath, Bucks; Earl Soham Grange, Suffolk; The View, Swanage, Dorset; Hyde End, Brimpton, Berks; London and South-Western Rly., Worplesdon Station; War Office, Newhaven Fort, Sussex; War Office, Riding School, Netheravon, Wilts; Rooksbury Mill, Andover; Millfields Works, Wolverhampton; Scunthorpe Works, near Doncaster; The Towers, Downe, near Orpington, Kent; British Medical School, Woodhouses, Ashton-under-Lyne; Bettyfold, Coniston.

PHILLIPS AND SON, SPEEDWELL WORKS, BIRMINGHAM. STAND NO. 22. ROW B.



The resource and ingenuity of the modern burglar have become so formidable since he has adopted scientific means of plying his trade that the makers of safes have been hard put to it to keep abreast of him. The problem has not proved insoluble, however, and at this stand are to be seen a number of strong-room doors and safes which are held by the makers to be not only burglar-proof, but fireproof. Practical tests have at least demonstrated the value of Messrs. Phillips and Son's safes in the latter respect, and as regards the former it is difficult to believe that any burglar could open such safes as are here shown, when it is remembered that the material is undrillable armour-plate, and the bolts are of the continuous "channel" type.

An especially interesting safe—the door of which is made of Naxian steel 2ins. thick—is on exhibition, designed expressly for the use of diamond merchants and those whose business involves very large risks. The patent "Channel" bolts encircle the door and frame, and are drawn inwards by turning the handle. This safe is protected against oxy-acetylene gas blowpipes.

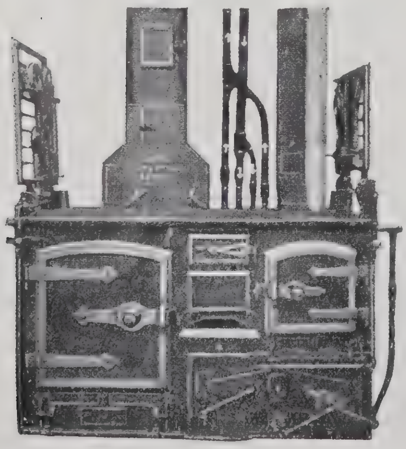
Amongst others the following well-known firms and corporate bodies are users of Phillips and Son's safes and strong rooms:—London City and Midland Bank (various branches); Hibernian Bank, Ltd. (various branches); York City and County Bank, Ltd.; H.M. Post Office; H.M. War Office; H.M. Admiralty; various district councils, local boards, county registrars, unions, and barracks; Marquess of Anglesea; Allsopps and Son, Ltd., Burton; Belfast and County Down Railway Co.; Belfast and Northern Counties Railway Co.; Belfast "Evening Telegraph"; Jas. Baldwin and Sons, Ltd., Birmingham; Baldwins, Ltd., Pontypool; Bank of Burmah, Rangoon; J. Barnsley and Son, Birmingham; etc., etc.

J. F. PHILLIPS AND SON, 21, OLD QUEEN STREET, WESTMINSTER, LONDON, S.W. STAND 205. ROW N.

It is broadly claimed for Barker's patent cable system of low pressure hot-water heating, which may be seen in full action at this stand, that it can overcome any obstacles, and maintain a good circulation of hot water at any temperature, in all circumstances, however disadvantageous, without requiring excavations, channelling or skilled attention, and often at a lower total cost than an ordinary system. It is automatic, and by its adoption hot water at any temperature can be freely circulated to radiators through very small pipes fixed without regard to direction or levels. The heating and circulating appatus required for this system, in addition to the boiler, is known as the "Thermo-Syphonizer," and is entirely enclosed and self-contained, and is fed by a single steam-pipe, conveying exhaust steam or other low-pressure steam at a pressure of 1½lbs. per square inch upwards, according to circumstances.

The following is a list of a few representative installations carried out in Barker's patent "Cable" system:—Cardiff Asylum, Newport Asylum, Bodmin Asylum, Newport Workhouse Infirmary; Padna Hospital, Italy; Rashleigh Sanatorium, Okehampton; Krugersdorp Town Hall (S. Africa); University of Leeds; University of Johannesburg; Standard Bank of S. Africa, Johannesburg; Banca d'Italia, Bologna, Italy; Newcastle Edinburgh Life Office; Cockerill Iron Works Offices, Belgium; M. Worth's shops, Rue de Paix, Paris; National Radiator Co.'s Works, Hull; Armley High Schools, Leeds; Barry Schools, Wales; Edinburgh Art Schools, Brighton Aquarium, Nottingham Hippodrome, The Agapemone, Bridgwater; Tain Church, Rusper Church, St. John's Church, Manchester; Worthing Chapel; Union Church, Brighton; Villa d'Este Hotel, Cernobbio, Como, Italy; residence of Mr. T. H. Brockbank, St. Bees, etc., etc.

THOMAS POTTERTON, CAVENDISH WORKS, BALHAM, LONDON, S.W. STAND 31. ROW B.

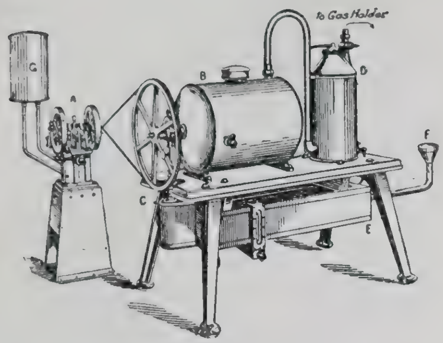


A comparatively new idea in ranges is exhibited at this stand, in the "Queen" combined gas and coal range. Since its first appearance at the Ideal Home Exhibition last October, the patentee has effected further improvements in it. Made in 3 sizes, this range has one oven and a hot closet, and oven cooking, hot-plate cooking, and water heating (for bath or sink supply), may be done with either coal or gas. An important innovation is the provision of the "Victor" gas boiler, which affords a supply of hot water when the coal fire is not in use. A feature which should be noted is that as hot water is withdrawn, the gas valve opens automatically, giving increased flames at the burner until the normal temperature of the water has been restored.

This exhibitor has for many years worked incessantly and successfully in the direction of improvement in stoves, flues, and heating apparatus, and his knowledge of the subject, derived from long and active practice, must indeed be extensive. It would almost seem as if there is something in the study of heating apparatus that tends to expand and develop latent genius; for certain it is that from the days of Count Rumford, and even earlier, an extraordinary amount of energy and talent has been devoted to this form of making "a happy fireside clime."

About Mr. Potterton's inventions there is always observable the evidence of a thoroughly practical acquaintance with the actual requirements of the case; and his exhibits this year—and, by the way, his is one of the stands that one always looks for at the building exhibition—are by no means an exception to this excellent rule. From the point of view of practicability, they will repay the closest scrutiny.

THE PRAED PATENT SAFETY GAS LIGHT CO., LTD., 20, VICTORIA STREET, LONDON, S.W. STAND 154, WALL SPACE.



The possibilities of petrol have doubtless many revelations in store for us. It is, indeed, rather surprising that so useful an agent should have been so long unexploited.

The Praed Safety Gas Plant generates gas from petrol vapour, which is combined with air. The percentage of petrol vapour is very small—about 1½ per cent., and it is to this fact that it owes its immunity from explosion. It is also non-poisonous, and may be inhaled without any risk.

The gas produces a blue flame of high temperature, and is successfully burned for illuminating purposes by means of mantle burners. It has many other uses, and can be employed for cooking, heating water, etc., but being non-explosive, it cannot be used for power. A small hot-air motor actuates an air-propeller and a pump, delivering respectively in the requisite proportions, air and petrol into the gas-producing chamber. Particular care has been taken in the design of the plant to prevent the leakage of petrol.

Plants have been erected for the North Staffordshire Railway, at Trentham Station, Ford Green Station, Sudbury Station, and Rochester Junction, carried out to the specification of the chief engineer of the railway company; installations at Pirbright Camp, for the officers' mess, wet canteen and dry canteen, carried out to the specification of the Canteen and Mess Co-operative Society; installation at Fort George, Nairnshire, carried out for the War Office.

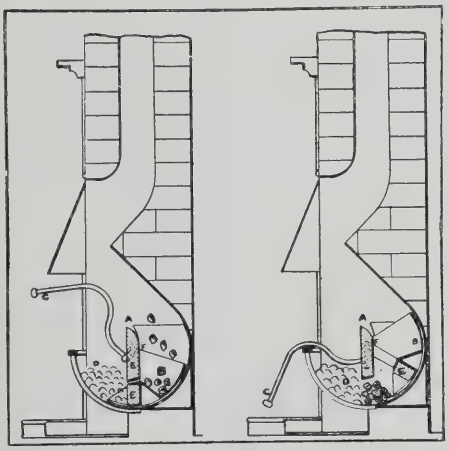
SMITH AND WELLSTOOD, LTD. 11, LUDGATE CIRCUS, LONDON, E.C. STANDS 170 & 171. WALL PACE.

An extensive assortment of interiors of "period" designs, some of which are exceedingly good, is the chief feature of this firm's exhibit. Messrs. Smith and Wellstood have recognised that architects will not specify grates of florid design, and that simplicity in combination with good taste, has become an essential condition to a ready sale. These interiors are in several instances made with side-wings or covings designed in harmony with the interiors, the intention being that tiled cheeks may thus be dispensed with.

The firm's goods are made with three finishes:—(a) Blacklead, (b) bright steel, and (c) electro-bronze. In the latter there are two varieties, one of which, antique electro-bronze, is similar in colour to an old penny. The "Wellstood" range, in which have been embodied some recent improvements, and a selection of newly-designed anthracite stoves are also exhibited.

The following is a list of some of the buildings (with their architects) in which "Wellstood" ranges and grates have been used:—Ritz Hotel, Mewès and Davis; Royal Liver Friendly Society, John Belcher; Edinburgh Life Assurance Co., Edinburgh, J. Dick Peddie; New Cookery Training College, Hampstead, Beazley and Burrows; Duke of York's Schools, Dover, Sir Henry Tanner; L. and S.W. Bank, Arthur C. Blomfield; Alliance Bank, Joseph and Smithem; official residence First Lord of the Admiralty (alterations), Sir Henry Tanner; new house, Norwich, P. Morley Horder; new house, Woolhampton, Mervyn Macartney; Henley Hall, Ludlow, Williams and Wratten; H.M.S. "Prince of Wales," The Admiralty; Prince Louis of Battenberg's room; Palace of the King of Siam, Palace of the Amir of Afghanistan, Palace of Seoul, Korea.

SMOKE CONSUMPTION, LTD. (COWPER-COLES PATENTS), 82, VICTORIA STREET, WESTMINSTER, LONDON, S.W. STAND 52. ROW C.



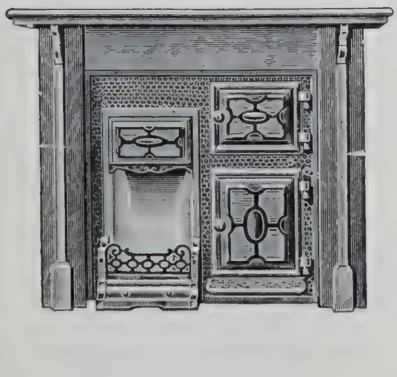
This company's principal exhibit is a model chimney fitted with caloriser patents, illustrating the apparatus which, when fitted to boilers and boiler flues, completely consumes the smoke. The model can be seen in operation by those interested in this subject, and there are also diagrams showing the application of the apparatus to Lancashire boilers.

Of greater interest to architects is a full-sized model of a domestic grate of the "underfeed" type. This is a very clever but simple invention, by which a hand lever controlling a pivot-hung coal tip causes the fuel to be shot into the bottom of the fire, through whose incandescence the newly-formed smoke must pass and so be consumed. This is an entirely new smoke-consuming grate, and is deserving of the serious attention of the profession. "Osbornite," a new smokeless fuel, and two patent ventilators, are also exhibited.

The war against smoke enlists the fullest sympathy of every architect, as well as of every hygienist; and the promoters of this Exhibition have always very properly laid the utmost stress on the necessity for smoke abatement.

Architects and other artists realise, of course, that smoke does more than make their work look grimy. There are those who affect the strange fallacy that St. Paul's Cathedral looks all the more characteristically London-like for its coating of soot; but the theory would hardly commend itself to Sir W. B. Richmond, who has done so much to beautify the interior of St. Paul's, and who would probably give much to see its exterior freed from its coating of soot, which, some say, is the Nemesis that has come to it as a reminder that it was built partly out of the proceeds of the coal dues. Sir William is, in fact, one of the most stalwart opponents of the smoke nuisance; and he would probably approve of this company's method of preventing that nuisance at its source.

THE STANDARD RANGE AND FOUNDRY CO., LTD., WATFORD, HERTS. STANDS 137 & 138. ROW H.



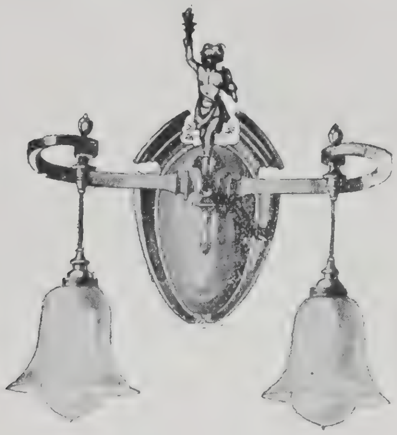
A stove which has no bars, needs no poker, and will burn any fuel without attention for hours at a time, should have a special interest for householders. The body of the fireplace is bowl-shaped in section, and at the bottom—in the centre—is a domical iron grating through which the ashes drop into a pan beneath. The sloping curved sides of the stove cause the coal to slip down towards the grating, thus making a compact fire to the last.

For hospitals and sick-rooms the "Burkone" fire—being self-stoking and consequently noiseless—should prove of particular value.

It can be fixed in place of stoves now obsolete, without material alteration to the hearth, and it has the further merit of standing on the floor level—thus obviating any excavation.

The following is a list of buildings (with their architects) where this Company's manufactures have been used:—Stanley Villas, Station Road, Amersham, O. Kennard, architect; Sandland Grove, Walton-on-Hill, H. J. Wise, A.R.I.B.A., architect; The Avenue, Tadworth, Surrey, Messrs. J. Hatchard-Smith and Sons, architects; new offices, Mansfield Colliery, Notts, F. Rowntree, architect; Royal Masonic Schools, Bushey, C. P. Ayres, architect; Cook's new offices, Strand, Messrs. Smee and Houchin, architects; Hertfordshire County Council schools, W. H. Syme, architect; Dickinson's Institute, Croxley Green, near Watford, C. P. Ayres, architect; new schools for the Corporation of Southend-on-Sea, T. H. Elford, architect; private houses, Newport, Mon., E. Maples-Linton, architect; new Council offices, Bushey, A. Durst, architect; new Manor House, Maesycrugiau, Carmarthenshire, Arnold Mitchell, architect; the Ecclesiastical Commissioners' Buildings, Millbank Street, Westminster, W. D. Caröe, architect; new Mansion, Bramley, Arnold Mitchell, architect, etc., etc.

C. J. THURSFIELD AND CO., 28, BERNERS STREET, LONDON, W. WORKS, BIRMINGHAM. STAND 173a, WALL SPACE



Electric light fittings of all kinds, the designs of which reveal a high standard of merit, are exhibited at this stand. They are supplied with various finishings, such as old brass, bronzed, gilt-colour, polished brass or antique copper, and can be had in iron (armour bright), and with an oxydised silver or silver armour finish. This firm also executes work in cast bronze.

A speciality, which will interest hospital architects, is a pendant for carrying the light in operating theatres. This is provided with a patent universal joint, which, while of simple construction, enables the light to be set at any required angle.

Some of the models exhibited are reproductions of old candelabra, etc.; others are frank translations of the details of the period, adapted to modern requirements.

The following are a few of the many recent public installations for which Messrs. Thursfield and Co.'s fittings have been selected:—Great Northern Hotel, Leeds; the Manchester and Counties Bank, Oldham; the Manchester and Counties Bank, Bolton; Albury Hall, W. J. Parker, architect, London; Carnegie Library, Wednesbury, S. T. Holliday, architect, Birmingham; Parish Church, Carlton, Glasgow; Royal National Orthopædic Hospital, London, Rowland G. Plumbe, architect; Grand Theatre, Oldham, Thos. Taylor, architect, Oldham; Bay Hotel, Falmouth; Parish Church, Stoke-on-Trent; Metropolitan Bank, Ltd., Swansea, F. Adams Smith, architect, London; St. Albans, Redland, Bristol, Messrs. Rodway (A.R.I.B.A.) and Dening, architects, Bristol; new Art Gallery and Museum, Bristol; Royal Barracks, Devonport; R.N. Barracks Church, Devonport; Imperial Hotel, Torquay; Mudies Library, London, etc., etc.

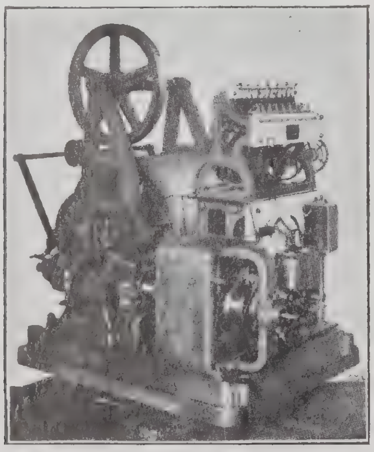
THE TEALE FIREPLACE CO., 38, COOKRIDGE STREET, LEEDS. STAND 173. WALL SPACE.

The barless type of fireplace—which has so largely come to the front of recent years—originated with this firm, which has been associated with the construction of fireplaces on scientific lines for over 35 years. At this stand may be seen representative types of this company's fireplaces, etc., designed to suit various requirements and embodying in their construction the most recent improvements. Among these may be noted the Patent Floor Protector, consisting of a sheet of iron which can be drawn out from under the hearth. This plate is attached to a tray, upon which rest two light ashpans, and the whole contrivance may be drawn out for the removal of ashes, without disturbing the fire. For use in sick rooms, this arrangement is of great value.

The firm also manufactures kitchen ranges, hospital ward stoves, etc., and undertakes hot-water heating.

The following is a list of hospitals where this company's ward stoves, etc., are in use: The London, Royal National Orthopædic, and Tottenham Hospitals, Rowland Plumbe; Lying-in Hospital, City Road, and Jewish Home for Incurables, M. E. Collins; Park Hospital, Lewisham, E. T. Hall; Rous Hospital, Newmarket, J. G. Oatley; Victoria Hospital for Children, Chelsea; Seamen's Hospital, Greenwich; the Royal London Ophthalmic, Middlesex, London Fever, Royal Free, and Evelina Hospitals; Royal Infirmary, Derby; Chelmsford and Essex Hospital, Chelmsford, etc., etc., Young and Hall.

THE TITAN LIFT AND ELECTRIC CO., 65, 67 AND 69, MOUNT PLEASANT, LONDON. W.C. STAND 271. ROW T

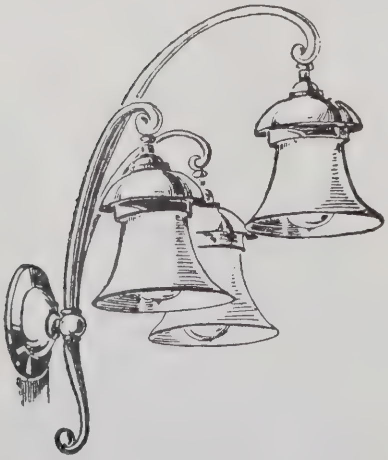


The lift as an institution has long been so thoroughly acclimatised in this country that it has now come to be regarded as absolutely indispensable to every establishment of any pretensions—not necessarily a passenger lift—though this kind has multiplied exceedingly within the past few years, its use on the tube railways having rendered it familiar. The Titan lifts—which are electrically driven—may be worked in various ways, such as the hand-rope and the switch systems; but in either of these an attendant is necessary.

Architects should therefore take particular note of the Titan push button system, by which this functionary is dispensed with. This type of lift is operated by means of a series of buttons—one for every landing, and when one of these is pressed the lift travels from whatever position it may be in, and finally stops opposite the door on the required level. After entering and pressing one of the buttons in the lift, it will move up or down to whatever level the button indicates. There are various safety devices in connection with the system by which it is impossible to open the landing doors until the cage is standing opposite to them, or start the cage unless all the doors are shut.

Titan lifts have been specified by the following architects: John Belcher, R.A.; Frank Verity, G. A. Lansdown, C. W. Stephens, Max. J. Zimmermann, Adams and Biggs, Worley and Armstrong, F. W. Foster, G. A. Sexton; and have been installed in the following buildings: Orb Factory, Luton; 44, Dover Street, W.; 25, Berkeley Square, W.; 7, Cleveland Road, S.W.; Elliot and Co., Bayswater; York Street, S.W.; 190, Brompton Road, S.W.; Blenheim Club, S.W.; General Motor Cab Co.; 9 and 10, Marble Arch, W.; 28, Margaret Street, W.

TREDEGAR AND CO., 56, VICTORIA STREET, WESTMINSTER. STAND 230. ROW O.



One of this firm's smaller electric lighting sets for country houses, guaranteed to light twenty-five lamps, each of 16-candle power, at 1d. per hour, is sure to be inspected with care and attention, since architects most certainly regard it as meeting a common requirement.

The engine for these lighting sets uses common petroleum for fuel, and sparking coil for ignition. It can be started by means of the blow-lamp supplied, or by using petrol for a few minutes when commencing the run.

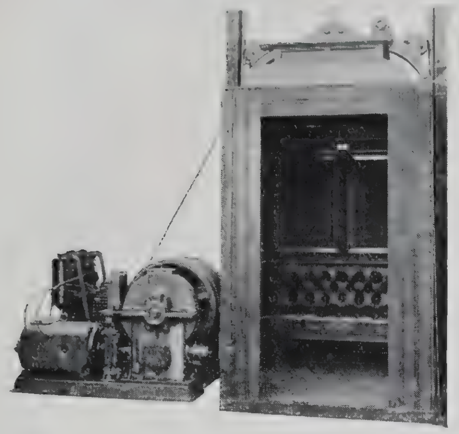
The dynamo is a well-built, simple machine, requiring a minimum of attention, and the switchboard is a model of convenience.

In another quarter, equal interest will be centred in the special builders' lighting set, for lighting buildings, and engineering works while in course of construction. It can be erected with the utmost expedition, and, by means of armoured wandering leads, the lights can be taken to any part of the building; the runs being extended to any length by simply plugging together the necessary pieces.

The firm undertake the lighting of works in progress, and they were responsible for the whole of the electric lighting and power during construction of the Baker Street and Waterloo Railway, the Piccadilly Hotel, and the Waterloo Station improvements.

Although stress is here laid on exhibits of special professional and trade interest, it must not be overlooked that Messrs. Tredegar do a large business in general electric work, and supply complete installations, from engine to lamp, and they exhibit a large number of high-class fittings of eminently artistic design, showing great catholicity of taste with respect to ideas, styles, and periods. They also specialise in wood fittings for electric light installations, and here again excellent taste and abundant variety are conspicuous.

R. WAYGOOD AND CO., LTD., FALMOUTH ROAD, LONDON, S.E. STAND 58. ROW D.



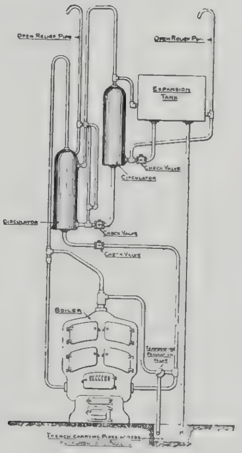
Messrs. Waygood and Co. exhibit—in addition to a number of working models—a full-size electric passenger lift travelling from the ground floor to the gallery. A feature to be noted is the enclosing of the gear in a cast-iron case, with the worm beneath the wheel, by which arrangement it is always running in oil. Another very important point is the easy access provided to the bearings, which enables repairs or adjustments to be effected without dismantling the gear.

It is difficult in a short notice such as this to describe in detail the many improvements and safety appliances which are embodied in this lift, but visitors will have every opportunity of satisfying themselves of its completeness in all respects by actual inspection.

The working models previously mentioned illustrate respectively Waygood's full automatic push button electric lift, a suspended hydraulic passenger lift, and the Waygood patent hydraulic luffing crane. There are also exhibits of electric rope grips, and samples of wrought-iron and wirework suitable for lift enclosures.

Waygood's lifts have been installed in the following buildings (architects' names are in parentheses):—War Office, Whitehall, New Local Government Board Offices, Whitehall, Admiralty buildings, S.W. (under the supervision of the chief engineer to H.M. Office of Works; Grand Trunk Railway Co. offices, Cockspur Street, W., premises for Pearson and Sons (Sir Aston Webb); St. Bartholomew's Hospital (I'Anson and Sons); Chartered Bank of India, Old Broad Street (Gordon and Gunton); new Sessions House, Newgate Street, E.C. (the late E. W. Mountford); new Strand Palace Hotel (C. Ancell); offices of Commissioners of Woods and Forests, Whitehall (J. Murray).

WERNER, PFLEIDERER AND PERKINS, LTD. STAND 255 AND 256. ROW R.



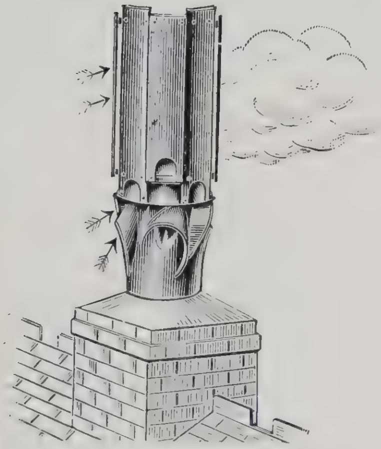
One delightful peculiarity of the common or garden flow and return system is that it takes a highly-trained expert to understand its interesting little divagations. Such an expert is not always available, and is usually very expensive. He gives his advice with the lordly air of a consulting physician, and the mechanics who are called in to carry it out succeed in nothing but in making the architect's hair turn grey. A system free from these disadvantages is here exhibited.

The system of low-pressure hot water heating adopted by this firm differs very materially from those generally employed. In ordinary installations the circulation is derived naturally from the difference in weight between two columns of water arranged respectively as "flow and return," and there are certain rigid requirements consequent upon their adoption (such, for instance, as the necessity for the boiler to be below the level of the heating pipes and radiators), which at times prove matters of difficulty.

This company has perfected a system—the "Pulsial"—by which the hot water is circulated compulsorily. The apparatus is noiseless and automatic in its working, and by its use the circulating pipes and radiators may be disposed at will, while perfect freedom as to the position and level of the boiler is allowed.

The following are some of the buildings in which the "Pulsial" system is installed:—Messrs. Wolfram (Tungsten), M.F. Lamps, Ltd., Hammersmith; Messrs. W. H. Smith and Sons, Kingsway, London, W.C.; Thorne Provided Schools, Yorks; Maldon Grammar School, Essex; Treeton Provided School, Yorks; Ben Rhydding School, Yorks; Glenelg, Peterborough; Paston Hall, Peterborough; Prince of Wales Hospital, Tottenham, etc., etc.

E. G. WRIGHT, GUILDFORD, SURREY, STAND 185. ROW K.



Mr. Wright, of Guildford, having been for nearly forty years a ventilating specialist and chimney expert, invented, as the outcome of his long and varied experience and observation, the "Twentieth Century Chimney Cowl." This device, which has no revolving parts, and is thereby the less likely to get out of order, is so contrived as to cause an updraught from every direction of the wind. This phenomenon we remember to have seen Mr. Wright demonstrate. Placing a piece of paper in the flue, he blew down the cowl, with the result that the paper flew, not downwards, as might have been expected, but upwards, as if in defiance of the laws of nature.

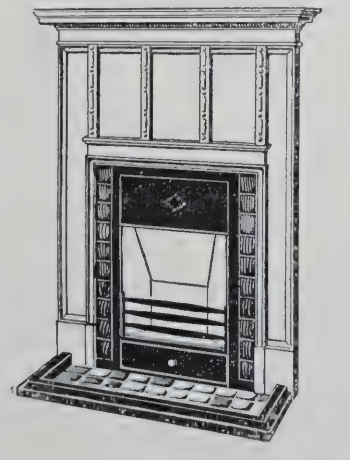
The cowl can be swept as easily as an ordinary chimney, and cannot interfere with the free movement of the sweep's brush. It is made of galvanised sheet steel, coated with iron paint. It is, therefore, very strong and durable; and as every part is riveted, it weathers bravely the highest winds.

The same exhibitor's "Excelsior" down-blow preventer chimney-pot is made either in buff or red stoneware or in galvanised sheet metal.

The patent "Twentieth Century King Ventilator," having an improved lifting draught at the base, is also on view, as well as a patent hot-air stove for laundry drying rooms and for heating greenhouses, schools, etc.

The cowls are in use on many Government and other important buildings, including the Arsenals and public buildings in Jersey and Guernsey, and on numerous barracks.

YATES, HAYWOOD AND CO., 15, BERNERS STREET, OXFORD STREET, LONDON, W. STAND 254. ROW Q



At this stand are exhibited some of the more representative of the company's manufactures, such as a kitchener, mantel registers, interiors, and wood mantels.

The kitchener is the firm's patent "Quadrant" lift fire pattern, which is self adjusting, and there is the additional advantage that there is no rack in the front to get out of order, as the quadrant on which the bottom moves is placed far enough away from the heat to prevent expansion of the movable parts.

The mantel registers are good examples of casting, and the designs are in keeping with the material.

In the section devoted to interiors are to be seen several fitted with improved low fires. A good point about these interiors is that the bricks may be removed from the front without disturbing the setting of the stove. Attention has also been given to the construction of the fireback, so that the excessive waste of fuel in the form of smoke may be prevented. The hoods are hand made, and are of brass or copper, in either adjustable or lift-off form.

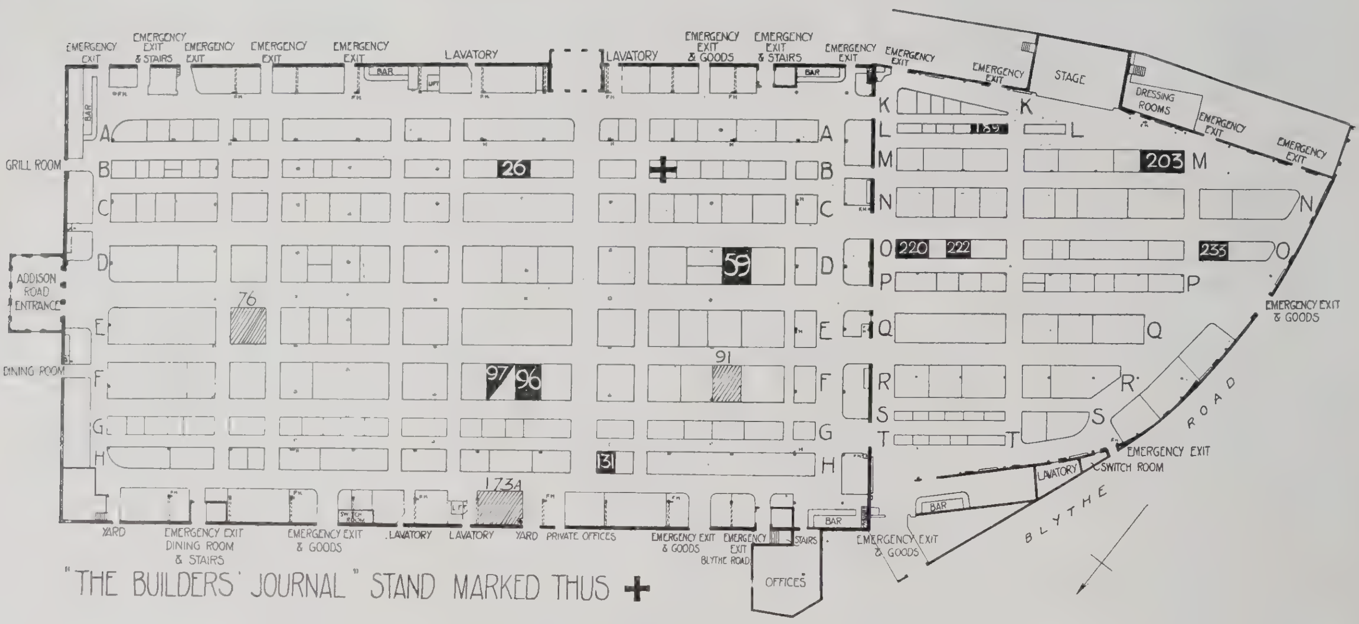
This company has on view several examples of wood mantelpieces in whose designs may be detected a distinct advance in the matter of refinement and seemliness. Marble and tiled surrounds in very good taste are shown in conjunction with them.

Messrs. Yates, Haywood and Co., are also manufacturers of tiled grilling stoves, suitable for hotel dining rooms and restaurants, and containing all the improvements which modern cookery demands, such as a hot closet fitted with folding doors, lift-out fire bars, bright grill, etc., etc.

Taken altogether, this stand may be described as one possessing many features of interest to architects, and time should be found for visiting it.

SECTION SEVEN.

Art Metal. Ironmongery. Leaded Lights. Stained Glass. Glazing.



"THE BUILDERS' JOURNAL" STAND MARKED THUS ✚

The following firms are noticed under this section, and their stands are blacked in, with numbers in white:—

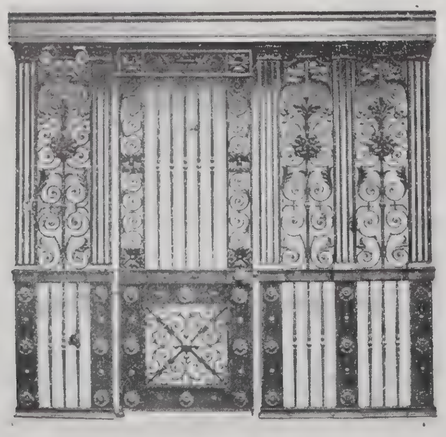
203	M	Birmingham Guild of Handicraft, Ltd., p. 390.
200	O	Campbell and Christmas, p. 391.
26	B	Chance Bros. and Co., Ltd., p. 391.
59	D	Gibbons, James, p. 391.
233	O	Guild of Decorators' Syndicate, Ltd. (The). p. 391.
97	F	Hope, Henry, and Sons, Ltd., p. 392.
189	L	Panels, Ltd., p. 391.
131	H	Maximum Light Window Glass Co. (The), p. 392.
222	O	Shaw and Carter, p. 392.
96	F	Wenham and Waters, p. 392.

REFERENCES.

The following firms are noticed under other sections, but are showing exhibits connected with this one. Their stands are indicated by hatching:—

76	E	Expanded Metal Co., Ltd. (The), (Fencing, Workmen's Lockers), p. 371.
91	F	Mellowes and Co., Ltd. (Glazing Bar), p. 395.
173a	C	Thursfield, C. J., and Co. (Electric Fittings), p. 388.

THE BIRMINGHAM GUILD OF HANDICRAFT, LTD., 45, GREAT CHARLES STREET, BIRMINGHAM. STAND 203. ROW M.



The Birmingham Guild of Handicraft shows some very high-class work at this stand, such as wrought-ironwork and cast-bronzework for architectural decoration, electric and gas fittings, door and cabinet furniture, grates, fire-dogs and gas stoves, and enamel work.

The attention of architects may be drawn to the forged iron and cast bronze screen here exhibited, of which the mouldings and leaf work are forged with mounts, capitals and entablature of cast bronze.

Among the specimens of enamel work should be noted the Guild's enamel letters for shop fascias and signs. These are particularly good and of pleasant form, while the enamel merges from peacock-blue—in the upper part—to green below. These colours are in themselves mottled, and thus produce an artistic effect. The letters are made with or without bronze margins.

The following is a list of buildings for which the Birmingham Guild has executed metal work: Messrs. Debenham and Freebody, Wigmore Street, J. S. Gibson, architect; No. 8, Addison Road, Halsey Ricardo, architect; Hamburg-America Line Offices, Cockspur Street, A. T. Bolton, architect; Ponsbourne Park, Hertford, P. K. Allen, architect; Axwell Park, Durham; house at Chertsey for Sir J. Brunner, R. P. Jones, architect; Madresfield Court, Malvern Link, for the Rt. Hon. Earl Beauchamp; Birmingham University, Sir Aston Webb, R.A., architect; Glasgow Liberal Club; Elder Library, Govan; Shire Hall, Aberdeen; Technical School, Warrington; Royal Mental Hospital, Croydon; City Asylum, Hollymoor, Birmingham; Scotsman Buildings, Edinburgh; Co-operative Buildings, Glasgow; Alexandra Hotel, Harrogate; Wellington Hotel, Harrogate, etc., etc.

CAMPBELL AND CHRISTMAS, WEST BROMPTON. STAND 220. ROW O.

The "storied windows, richly dight," are now less than ever confined to the "dim cathedral aisle." They, or some appropriate modification of them, are gladly adopted in the home, as well as in the public or semi-public building. Tinted and stained glass and leaded lights, by the associations, or in their own inherent quality, may create within an atmosphere of tranquillity, and without, as well as within, an appearance of sumptuousness; and these things are, when tastefully arranged, an inestimable boon in these utilitarian times. They make for joy.

This firm shows not only leaded lights, but also stained plate glass for roofs. Specimens of iron casements are also exhibited, and Opus sectile and mosaic work, as well as other forms of decoration, are also shown.

CHANCE BROTHERS AND CO., LIMITED., GLASS WORKS, NEAR BIRMINGHAM. STAND 26. ROW B.

The love of a glassy surface seems perennial and ineradicable, and at the present day the mosaics at St. Paul's and the scheme for the decoration of the Roman Catholic Cathedral at Westminster testify to the high regard in which vitreous ornamentation is held.

Even those who profess not to share in the popular admiration will come near conversion when they see the beautiful uses to which glassware can be turned by competent craftsmen like the present exhibitors.

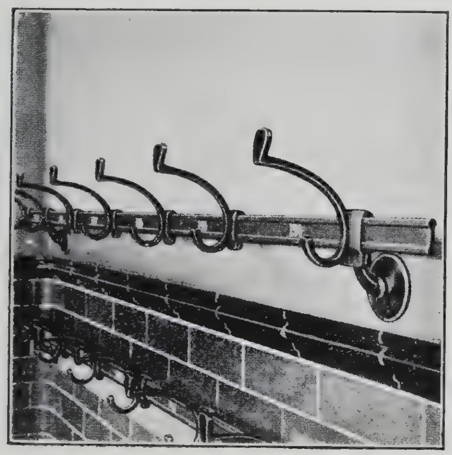
The panelled ends of the stand are formed of Venturene opal tiles in white and various tints, and in different sizes, with plain and with figured surfaces.

Dado wings to the stand are formed of the extra-thick opal tiles that are used as surface coverings in hospitals, subways, railway stations, engine-rooms, etc. Skirtings and dado mouldings give variety and finish.

Vitreous glass mosaic panels forming the name and address of the exhibitors indicate a particularly useful service that may be rendered with this material. Signs and fascias constructed of vitreous mosaics were never more popular than they are to-day, which is not surprising, considering the breadth and boldness of their appeal, which, withal, has in it a considerable touch of artistry.

The firm show many attractive samples of their tiles and mosaics, besides samples of various kinds of ornamental window glass.

JAMES GIBBONS, ST. JOHN'S WORKS, WOLVERHAMPTON; AND 9, SOUTHAMPTON ROW, HOLBORN, W.C. STAND 59. ROW D.



Conspicuous among the exhibits at this stand are Gibbons' patent adjustable cloakroom fittings, in which the "Gosforth" safety hook is attached to a bar rail, which advantageously supersedes the customary tube. The arrangement certainly scores in neatness and simplicity, while the hook gives the utmost assurance of safety—an inestimable quality where school children are concerned.

The door furniture that is represented in such great variety is designed on genuinely artistic lines, and covers a wide range of both taste and utility, including, one can well suppose, every article that can possibly be required for any kind of door.

Electric fittings are also shown in great variety; and here, again, the designs are conspicuously tasteful, especially with respect to the metal-work, in which the best models have been adopted or adapted to the up-to-date requirements of electric lighting.

A list of buildings, etc., recently fitted by Mr. James Gibbons, includes the following. The architects' names are given in parentheses:—The Royal London Friendly Society (John Belcher); Messrs. Mappin and Webb's premises (John Belcher); house in Belgrave Square (John Belcher); Belfast City Hall (Sir A. Brumwell Thomas); Woolwich Town Hall (Sir A. Brumwell Thomas); Stockport Town Hall (Sir A. Brumwell Thomas); London, Edinburgh, and Glasgow Assurance (Professor Pite); Audley House (Simpson and Ayrton); Albemarle Club (Smith and Brewer); Strand Palace Hotel (W. J. Ancell); Shanghai and Nangkin Railway (Chas. Barry); new infirmary, Wandsworth (J. S. Gibson); Hull Town Hall (Russell and Cooper); Ramsgate Hospital (Wood and Ainslie); Langham Hotel (J. MacVicar Anderson); etc., etc.

It will, of course, be understood that this list could easily be extended.

THE GUILD OF DECORATORS SYNDICATE, LTD., 29, NEWMAN STREET, OXFORD STREET, LONDON, W. STAND 233. ROW O.

The Guild of Decorators includes among its artists and craftsmen men who have distinguished themselves by the high quality of their executed work in the several branches of decorative art, and whether it be stained glass, metal work, furniture designing, sculpture, or mural painting, each secures due recognition for his work, instead of having his identity sunk, as is so often the case, in the name of a commercial firm.

At this stand may be seen some exceedingly good examples of metal work designed and carried out by the Guild, and a small room decorated in an adaptation of the Pompeian style, with painted pilasters and panels. This is intended as an illustration of carefully considered and tasteful methods of colour decoration as a substitute for the prevailing fashion of an "all white" finish.

The patent "Guildecor" hinge is very well except, perhaps, for its name. We grant that it is expressive enough; but does it not savour rather more of commerce than of art? That, after all, is not our concern; and this very mild, and, we trust, judicially stated, protest is the only criticism that we have to offer with respect to a thoroughly interesting series of exhibits, which reflect in a very striking manner the advance in taste and skill of which the mere existence of such institutions as this affords must be gratifying testimony.

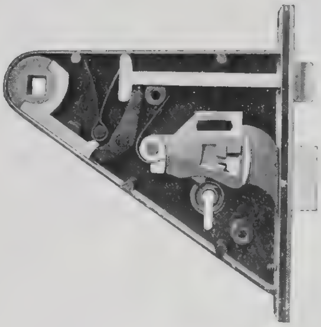
PANELS, LTD., DUKE STREET, BIRKENHEAD. STAND 189. ROW L.

An entirely new mechanically-produced repoussé is exhibited at this stand in the shape of a series of panels made by this firm. These are of varied size and design, and can be obtained in silver, copper, or brass. The manufacturers undertake to reproduce in metal any design by this process from the artist's original drawing.

Architects will probably prefer those examples whose designs are confined solely to Renaissance ornament. There are numerous other panels illustrating nautical subjects, etc., which have a more general interest, and will appeal to those outside the profession.

A set of panels in brass has recently been supplied to the builders of the SS. "Abangarez" for the firct-class smoke-room.

HENRY HOPE AND SONS, LTD., 55, LIONEL STREET, BIRMINGHAM. STAND 97. ROW F.

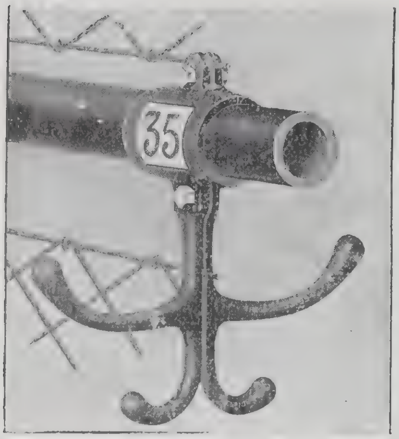


Messrs. Henry Hope and Sons show at this stand a very interesting selection of their metal casements and sashes, opening gear, leaded lights, bronze, brass, and iron hardware, cast leadwork and patent glass roofing. The casement sections range from those of the very highest grade to the simpler forms, suitable for cottage casements, and in all cases they display the same care as regards constructional detail.

Among the exhibits of bronze, brass, and iron hardware are some particularly well-designed knockers, door knobs, and finger plates, etc. Messrs. Hopes' patent glazing, which has steel bars sheathed in lead, possesses special features, and should be examined by architects. An improved mortise lock (822), which is shown with a variety of other types, is of such shape as requires less cutting of the lock-rail tenon in fixing. This is clear from the illustration given.

Among some of the buildings lately fitted with Hope's metal windows, etc., are the following, with names of their architects:—Ashton Memorial, Lancaster, John Belcher, R.A.; New Law Courts, Hull, S. B. Russell and T. E. Cooper; New Town Hall and Law Courts, Cardiff, H. V. Lanchester and E. A. Rickards; Eton Memorial, Windsor, L. K. Hall and S. K. Greenslade; Stockport Town Hall, Sir A. Brumwell Thomas; Birmingham University, Sir Aston Webb, R.A., and E. Ingress Bell; Gerrard Telephone Exchange, London, Leonard Stokes; Mappin and Webb, Ltd., Oxford Street, John Belcher, R.A.; Debenham and Freebody, Ltd., Wigmore Street, J. S. Gibson; Warehouse for Spalding and Hodge, Ltd., W. H. Harrison and Melville S. Ward; "Bystock," Devonshire, W. H. Ansell; New Berwick House, Wiltshire, Detmar Blow; etc., etc.

SHAW AND CARTER, EDGBASTON STREET, BIRMINGHAM. STAND 222. ROW O.



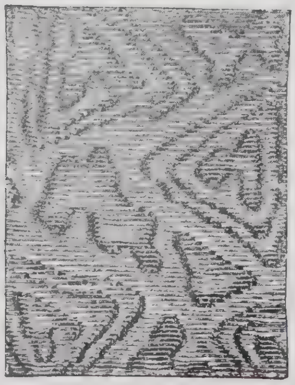
Recent lectures and discussions show that architects and builders are fully alive to the trend of the current movement with respect to the planning and equipment of schools. A new order of building is being evolved; and its plenishings are receiving increased attentions, down to the minutest detail.

There are several very useful articles displayed here, patented and manufactured by this firm. School architects will in particular be interested in the patent "Shawcar" hat and coat hooks, which combine several novel features. They are designed so that the numbers are not hidden when hats are hung on the hooks, and, moreover, the numbers are interchangeable, and can be made in any colour. The most conspicuous advantage presented by these hooks is that wiring or bolting of the panels is obviated, as the act of bolting the hooks to the tube rails secures the wire panels to the hooks, which are divided (or grooved) for the purpose.

The patent ball-bearing "Shawcar" Axle Pulley is another recently introduced improvement. It is suitable for any pattern of cord, cable, or chain, and is well worth examination.

The following is a list of buildings (with their architects) where Messrs. Shaw and Carter's fittings have been used:—Langho Epileptic Colony, Blackburn, Lancs, Giles, Gough and Trollope; Nurses' New Homes, etc., etc., Leicester, Everard, Son, and Pick; H.M. Police Station, Scotland Yard, Dixon Butler; Cheddleton Asylum, Leek, Staffs., Giles, Gough, and Trollope; Barming Asylum, Maidstone, J. W. Jennings; Poplar Cottage Homes, Shenfield, Essex, Holman and Goodrham; Leicester Workhouse and Infirmary, Giles, Gough, and Trollope; "Bournville Garden City," "Hampstead Garden Suburb"; etc., etc.

THE MAXIMUM LIGHT WINDOW GLASS CO., 28, VICTORIA STREET, WESTMINSTER, LONDON, S.W. STAND 131. ROW H.



The extensive loss of daylight in offices and basements having their outlook on narrow streets with tall buildings opposite, has in a large degree been reduced by the substitution of patent window glass for ordinary sheet or plate. At this stand can be seen the various specialities of the Maximum Light Window Glass Company, the most important of which—as a daylight recoverer—is the "Maximum Light" window glass. It is prismatic on one face, and has lenses on the other, and it is this combination which produces the remarkable effects known to result from its use. Its adoption by architects, in positions where the light is particularly bad, may be confidently recommended.

This firm also shows its "Cat's Eye" glass, and a novelty in figured glass—the "Max Silk" glass—which latter is here illustrated.

The following is a list of London buildings in which this glass has recently been used: H.M. War Office Department; Royal Arsenal, Woolwich; Wellington Barracks; New Westminster County Court, St. Martin's Lane; Hotel Cecil; 20, Essex Street, Strand; Sun Insurance Co., 40, Chancery Lane, W.C.; for H.M. Office of Works—Charles Street, S.W.; Mellier and Co., 26a, Albemarle Street, W.; Salubra Wall Covering Co., 103, Great Portland Street, W.; H.M. Office of Works, Tower of London; Bachelor's Club, Hamilton Place, W.; Glenburn Hotel, Great Russell Street; Harley House, Regent's Park; St. Mary's School, Putney; Thackeray Hotel, Great Russell Street; Capel House, New Broad Street, E.C.; Goldsmiths' College, Lewisham High Road, S.E.; Stockwell College, S.W.; Middle Temple Buildings; Mansion House Chambers; Messrs. Goldsmith and Silversmiths Co., Ltd.; etc., etc.

MESSRS. WENHAM AND WALTERS, LTD., PARAGON WORKS, VICARAGE ROAD, CROYDON. STAND 96. ROW F.

One of the principal features at this stand is an exhibit illustrating the application of "Fowler's" Patent Sliding Hinges to both wood and metal casements. By means of these hinges—which are provided with telescopic extensions fixed to the top and bottom rails of the casement—the latter may be bodily shifted laterally, in such a manner that it can be easily cleaned.

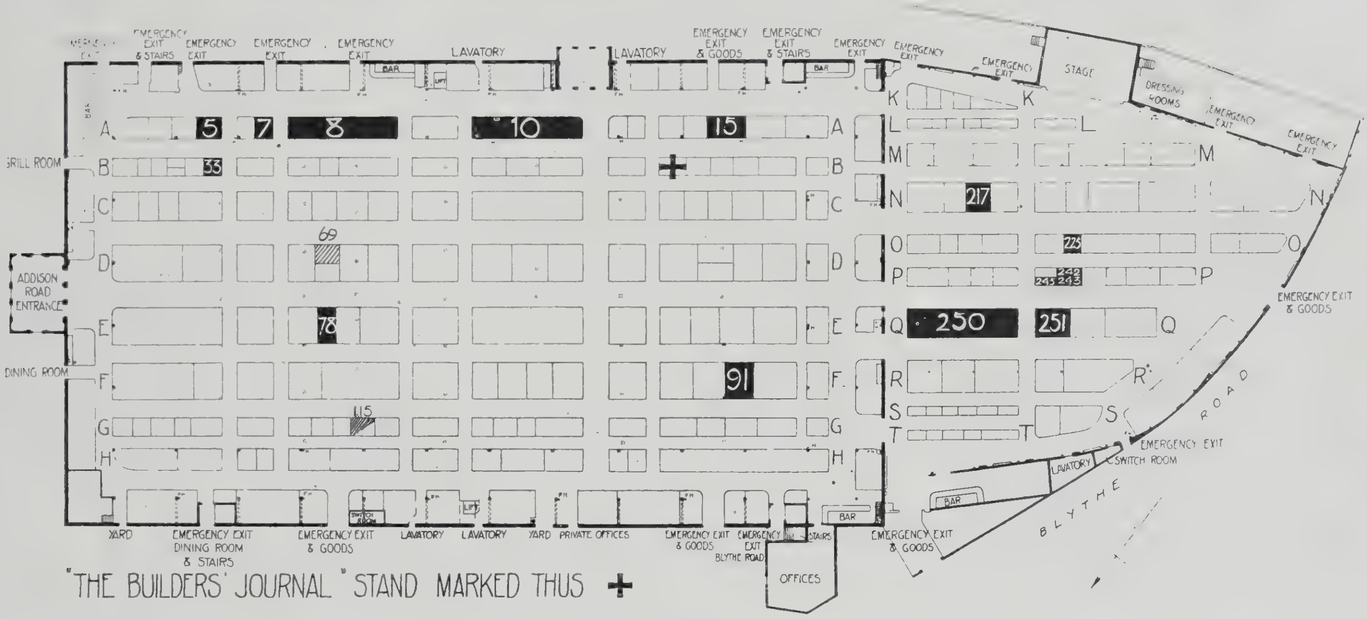
The firm is also showing specimens of forged welded casements, which are forged on the anvil in the old-fashioned manner. It should be mentioned that oxygen gas welding has so largely entered into the manufacture of casements in recent years that Messrs. Wenham and Waters desire, in reverting to the older method, to demonstrate its superiority over the newer.

Among other exhibits at this stand are various new sections of "Cottage" casements, samples of ventilating radiators, lead rainwater heads, etc., etc.

The following is a list of buildings (with their architects) for which this firm has supplied casements, lead glazing, etc.:—West Ham Hospital, British Medical Institute, Strand, W.C., King Edward VII. sanatorium, Midhurst (Adams and Holden); Carshalton public offices and fire station (F. Atkinson, F.R.I.B.A.); Bloemfontein Law Courts, South Africa (Baker and Massey); Epsom College (Chas. Barry, A.R.I.B.A.); "Ashgrove," Seven Oaks (F. S. Chesterton); Liscombe Park (Tom P. Clarkson); City of London Lying-in Hospital; Anglo-South American Bank (M. E. Collins, F.R.I.B.A.); Bradford Town Hall (F. E. P. Edwards, A.R.I.B.A.); house, Limpsfield, Surrey (Arthur Keen, F.R.I.B.A.); houses, Amersham and Chesham (Kemp and How); Polesden Lacey, near Dorking (Mewès and Davis), etc.

SECTION EIGHT.

Sanitation and Sanitary Fittings. Plumbing.



Section VIII.—SANITATION.

The following firms are noticed under this section and their stands are blacked in, with numbers in white :—

235	O	Auto-Controller and Switch Co., p. 393.
7	A	Cakebread, Robey and Co., p. 394.
8	A	Davis, Bennet and Co., p. 394.
250, 251	Q	Doulton and Co., Ltd., p. 394.
78	E	Jones, John, (Chelsea), Ltd., p. 394.
217	N	Knowles, John, and Co., p. 395.
91	F	Mellowes and Co., Ltd., p. 395.
245	P	Moule's Patent Earth Closet Co., Ltd., p. 395.
15	A	North British Plumbing Co., Ltd., (The), p. 395.
33	B	Patent Tip-up Bath Co., (The), p. 396.
10	A	Shanks, Ltd., p. 396.
5	A (Ground Floor, Bay 27, Gallery)	Webb Lamp Co., Ltd., (The), p. 396.
242, 243	P	Woodward, James, Ltd., p. 396.

The following firms are noticed under other sections, but are showing exhibits connected with this one. Their stands are indicated by hatching :—

69	D	Brook, F. H., ("Ideal" Screw-down tap), p. 358.
115	G	Sankey, J., and Sons, Ltd., ("Ephos" Sanitary Ware), p.365.

THE AUTO-CONTROLLER AND SWITCH CO., SIMPLEX WORKS, VIENNA ROAD, JAMAICA ROAD, BERMONDSEY, LONDON, S.E. STAND 325. ROW O.

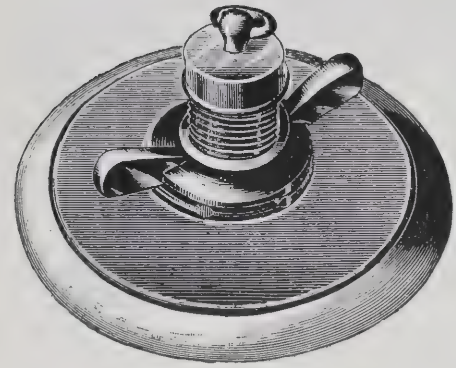
SOLDERING PASTE
FLUXITE
REGISTERED
FOR USE INSTEAD OF SPIRITS OR RESIN.
SUITABLE FOR ALL METALS, (EXCEPT ALUMINIUM) METALS OTHER THAN CAST IRON NEED NOT BE CLEANED DOES NOT CORRODE. CANT BE SPILT
THE MOST EFFECTIVE FLUX KNOWN.

"Fluxite" is of particular interest to plumbers, and is a paste which renders soldering an easy matter. It is claimed for it that the metals to be soldered by its aid (as a flux) need not be previously filed or cleaned, even if greasy, dirty, or covered with paint. This does not apply to iron, however. In the case of jointing leadwork, the solder may be dispensed with entirely, all that is necessary being a blow pipe.

Its uses and advantages are numerous, and its capabilities in a variety of directions are exemplified by the demonstrator, who gives practical illustrations for the information of visitors.

The following are a few of the users of "Fluxite": The Royal Arsenal; the Royal Engineers; the Indian Government; Cape Government Railways; London and North Western Railway; Great Eastern Railway; Great Northern and City Railway; London County Council Tramways; Blackpool Corporation Tramways; Burnley Corporation Tramways; Borough of Ilkeston Tramways; Lincoln Corporation; Coventry Corporation; Newport Corporation; Epsom District Council; Board of Education; Cambridge University; London County Asylums; Bowdens Patents Syndicate, Ltd.; Sun Electrical Co., Ltd.; Magnetos, Simms, Bosch, Ltd.; London Electric Wire Co., Ltd.; Tate and Co., Ltd.; Bruce, Peebles and Co., Ltd.; Barclay, Perkins and Co., Ltd.; Veritys, Ltd.; Whitehead Torpedo Works; Aerators, Ltd.; Stones, Wilkinson and Co., Ltd.; Telegraph Construction Co., Ltd.; Bolding and Sons, Ltd.; Empress of India Cotton Mills; Troupe, Curtis and Co., Ltd.; J. Stone and Co., Ltd.; Parsons Motor Co., Ltd.; Wm. McGeoch and Co., Ltd.; Dodd and Oulton, Ltd.; Lautaro Nitrate Co., Ltd.; Richard Pape, Ltd.; etc., etc.

CAKEBREAD, ROBEY AND CO: STOKE NEWINGTON, LONDON, N. STAND 7, ROW A.



Messrs. Cakebread, Robey and Co. exhibit a comprehensive selection of drain cleansing rods, drain tools, drain cleaners, smoke test machines, drain plugs, etc. The specialities of this firm's manufacture are their patent lockfast joints for drain rods, among which are the "Slide Bolt," "Simplex," "Clutch Bolt," "Swivel Collar," "Ball Clutch," and the "Ferret." The last mentioned is their well-known joint, which is extensively used in various departments of the Government, corporations, municipalities, urban district councils, at home and abroad, and also by the principal railway companies. A very large number have also been supplied to telephone and electrical companies for the laying of cables.

Another speciality is the "Standard" smoke test machine, made almost entirely of metal. This will charge 50ft. of 6in. drain per minute, and the pump will give a pressure of 15lbs. per square inch.

Messrs. Cakebread, Robey and Co. are contractors to the War Office, Post Office, Telegraph Department, L.C.C., Indian Government, G.N. Railway, G.W. Railway, L. and N.W. Railway, corporations of Cape Town, Leeds, Bradford, Doncaster, Cheltenham, Bournemouth, Rochester, Ipswich, Newport, Limerick, etc.; municipalities of Cawnpore, Naini-Tal, Allahabad; City of Rio de Janeiro; urban district councils, local boards, etc.; electrical engineering companies, builders, contractors, etc., etc.

DAVIS, BENNET AND CO., WESTMINSTER SANITARY WORKS, HORSEFERRY ROAD, LONDON, S.W. STAND 8. ROW A.

A large selection of sanitary goods of all kinds is exhibited at this stand, where a series of apartments fitted up to represent respectively four model bathrooms and a model kitchen, will enable architects to examine this firm's manufactures. The floors are jointless and watertight in each instance, and the fittings include every requisite which modern sanitary science has evolved.

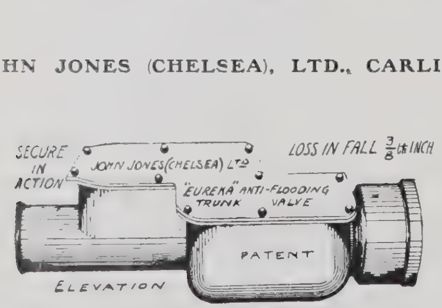
Attention may be called to the special lavatory for surgical use, with elbow-action, hot and cold supplies, knee-action waste, and a white enamelled cupboard over, fitted with glass shelves for instruments.

An interesting exhibit is the stack of soil pipe showing various connections with access door on each branch and bend.

The whole of the stand is lighted with a special system of incandescent gas.

The firm has carried out sanitary work for the following architects:—Sir William Emerson, Past Pres. R.I.B.A., Messrs. Gordon and Gunton, F.R.I.B.A., Messrs. Hesketh and Stokes, F.R.I.B.A., R. S. Ayling, Esq., F.R.I.B.A., Messrs. Ford, Son and Burrows, F.R.I.B.A., E. Keynes, Purchase, Esq., A.R.I.B.A., C. H. B. Quennell, Esq., A.R.I.B.A., M. E. Collins, Esq., F.R.I.B.A., Messrs. H. M. and W. Grellier, F.R.I.B.A., C. Stanley Peach, Esq., F.R.I.B.A., E. A. Minty, Esq., F.R.I.B.A., Messrs. F. and H. Francis, F.R.I.B.A., R. O. B. North, Esq., A.R.I.B.A., Messrs. Frank Matcham and Co., F.R.I.B.A., Stanley J. May, Esq., A.R.I.B.A., Messrs. Mallows and Grocock, F.R.I.B.A., Messrs. Gilbert and Constanduros, A.R.I.B.A., A. E. Jones, Esq., F.R.I.B.A., Lewen Sharp, Esq., A.R.I.B.A., T. E. Pryce, Esq., A.R.I.B.A., V. S. Dunkerley, Esq., F.R.I.B.A., Messrs. Mewès and Davis, A.R.I.B.A., E. Douglas Hoyland, Esq., A.R.I.B.A., C. W. Stephens, Esq., F.R.I.B.A., F. W. Stephenson, Esq., F.R.I.B.A., Messrs. Jarvis and Son, F.R.I.B.A., Messrs. Ernest George and Yeates, F.R.I.B.A.; etc., etc.

DOULTON AND CO., LTD., HIGH STREET, LAMBETH, LONDON, S.E. STANDS 250 AND 251. ROW Q.

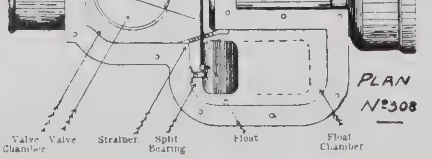


Several branches of manufacture are represented in this firm's exhibit, but it is mainly devoted to sanitary appliances, which are displayed in a series of rooms, where baths, closets, lavatories, etc., may be seen—ranging in price and quality, from such as are suitable for a cottage to those of the greatest luxury. A porcelain enamelled cast iron bath on wheels—designed so that the tub can be pivoted on the waste end—permits of more thorough cleansing of floor and walls than is otherwise possible.

The last room shows a collection of the most modern fittings used in the hydro-therapeutic treatment, where sudden changes in temperature are necessary.

Of special interest to architects is the exhibit of Carrara ceramic ware, an excellent building material, now much used for hotels, business premises, etc. Among these may be mentioned the Savoy Hotel extension, (Collcutt and Hamp, architects), the Corner House for Messrs. Lyons, the new Strand Palace Hotel, all in London. Messrs. Doulton are also showing numerous specimens of their art pottery Doulton ware in the shape of jugs, vases, bowls, etc., which are well worthy of attention.

JOHN JONES (CHELSEA), LTD., CARLISLE WORKS, CHURCH STREET, CHELSEA, LONDON, S.W. STAND 78. ROW E.



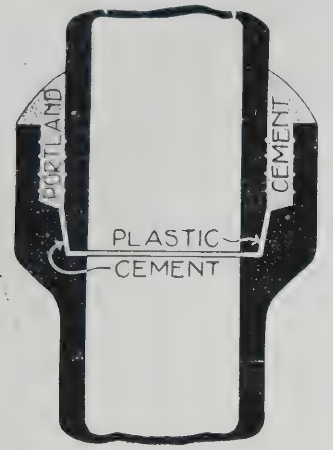
This firm exhibits a large selection of sanitary fittings and appliances of every description, among the latest being their Patent Anti-Flooding "Eureka" Trunk Valve, which is here illustrated. This invention provides for a valve which hangs in a chamber above the drain. On the flood water rising, the float in the adjoining chamber rises with it, and closes the valve. The Royal Sanitary Institute's bronze medal was awarded to the manufacturers of this valve in 1907. School, hospital, and laboratory fittings are well represented, and include many excellent types.

Surveyors will find the display of roadway and lamphole covers, sewer ventilating shafts, sewer ironwork, etc., of especial interest.

This firm also makes patent drain testing and clearing appliances, specimens of which are on exhibition.

The following is a list of buildings (with their architects) where this firm's drainage fittings have been supplied:—New War Office, Sir John Taylor, H.M. Office of Works; new Admiralty Buildings, Messrs. Leeming and Leeming; "Morning Post" Offices, Messrs. Mewès and Davis; Waldorf Hotel, Messrs. Marshall Mackenzie and Son; Tower of London (new drainage), H.M. Office of Works ; new British Embassy, Madrid, H.M. Office of Works; National Gallery (new drainage), H.M. Office of Works; new British Hospital, Constantinople, H. Percy Adams; New Military Barracks and Married Quarters. Tidworth, Salisbury Plain, Bulford, Borden Camp, Weedon; naval and military stations and hospitals at home and abroad for H.M. Government (Admiralty and War Departments); new South-Eastern Hospital, Messrs. T. W. Aldwinckle and Son, Gore Farm Hospital, Kent; Messrs. T. W. Aldwinckle and Son; Schools for London County Council; Schools for Messrs. Beazley and Burrows, A. H. Ryan Tenison, and R. L. Curtis and Sons; Schools in various parts of the United Kingdom for other architects; model dwellings for London County Council; etc., etc.

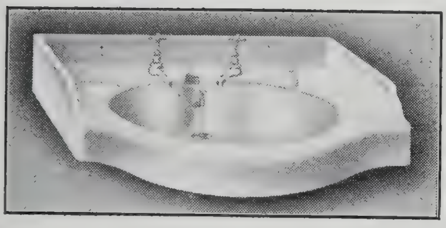
JOHN KNOWLES AND CO., LTD., 38, KING'S ROAD, ST. PANCRAS, LONDON, N.W. STAND 217. ROW N.



Knowles' "Free-Flow" stoneware drain pipe is the principal exhibit at this stand, and should be specially noted by architects and surveyors. It has unusual features, and differs materially from other patented joints. In the "Free-Flow," the spigot end is tapered, and is received by a corresponding splay formed on the inside of the socket, the two being jointed with plastic cement. The remaining part of the socket and the outer fillet are jointed in the ordinary manner with neat Portland cement, and the result is a cylindrical bore without lipping or overlapping. By this system the spigot end rests on the inner socket, and prevents any movement of the drain when the trench is being filled in; and the plastic cement jointing secures a close-fitting and water-tight joint, which is proof against the percolation of the Portland cement into the invert.

The following is a list of places (with architects' names) where "Free-Flow" pipes have been used:—London and South-Western Bank, Streatham; Wandsworth B.C.C.; Brockwell Hall, Herne Hill, Mr. Graham; Croydon Corporation, Norbury; Camberwell B.C.C., Herne Hill; Fitzroy Street, Tottenham Court Road; Hungerford Road, York Road; Medburn Street, Pancras Road; Church Road, Addlestone; Police Station (Canterbury Corporation), Mr. A. C. Turley; Isolation Hospital (Twickenham U.D.C.); Bromley Common, Mr. P. Coad; Station Road, Orpington, Mr. C. J. Barham; Oak Lodge, Chislehurst Common; South Hill, Bromley, Mr. P. Coad; Catherine Road, West Ham; High Street, Chingford; Hoe Street, Walthamstow; High Road, Chiswick; Tunis Road Hammersmith; Barnes District Council; Glaybury Road, W. Kensington; Ranleigh Gardens, Chiswick; St. Peter's Square, Hammersmith; Stowe Road, Shepherd's Bush, Messrs. Gale, Durlachen and Emmett; Auriel Road, W. Kensington; Acton Vale; New Infirmary, Lower Edmonton, Mr. Stewart Hill; etc., etc.

MELLOWES AND CO., LTD., SHEFFIELD. STAND 91. ROW F.

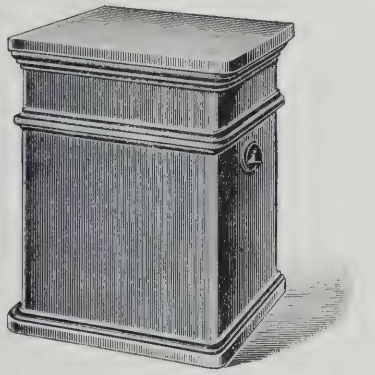


At this stand are exhibited several high-class sanitary fittings, such as a w.c. basin specially designed—without mouldings of any sort—to suit the requirements of architects. It is made by a new process, of highly finished earthenware, and has a very good appearance. The new model lavatory, also shown, is of similar make, plain, and with a large basin. There is a bath with a 4in. massive roll edge and a nickel-plated supply and waste, fitted independently. A similar bath to the last is provided with a hood, a nickel-plated needle and shower bath, and a plate-glass screen.

Attention is called to a series of samples of modern plumbing work showing special expansion joints in vertical lead waste pipes. This firm also makes the "Eclipse" Glazing Bar, consisting of a steel case encased in a lead sheath.

The following are some buildings, with their architects), in which this company's sanitary fittings have been used:—Ritz Hotel, London, Mewès and Davies; Waring and Gillows' premises, London, R. Frank Atkinson; Conkwell Grange, near Bath, E. Guy Dawber; Monsall Hospital, Manchester, H. Price, city architect; Townley Hospital, Bolton, J. Mawdsley; Orleans House, Liverpool, H. A. Matear; Mersey Docks Offices, Liverpool, Briggs, Wolstenholme, Hobbs, and Thornley; Underground Conveniences at Bury, Cleethorpes, Belfast, Sheffield, etc., etc.

MOULE'S PATENT EARTH CLOSET CO., LTD., 5a, GARRICK STREET, COVENT GARDEN, LONDON, W.C. STAND 245. ROW P.



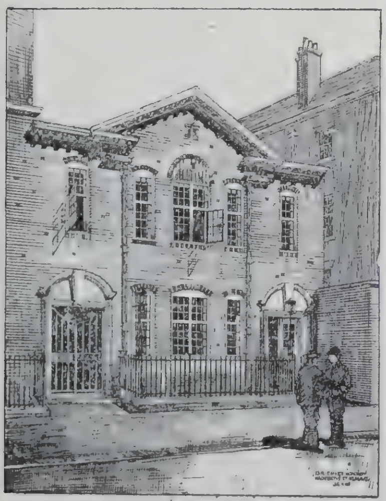
The utility of earth closets in places where flushing is impracticable is indisputable, and if the system is carried out with reasonable care by the users, it affords a wholly efficient means of sanitation. Of the many systems that have been adopted, none is better known throughout the civilised world than Moule's, which embodies a large number of ingenious patents, with the effect that the last degree of efficiency seems to have been reached, so that the earth closet is quite applicable to indoor use.

These well-known appliances have been recently further improved, and the new patent is applied to all the fittings sold by the company, which has also introduced two new patterns to the many now on the market.

The patent dry earth system has been in use for upwards of 40 years, and the general principles involved in its adoption do not require to be recapitulated to the present generation.

At this stand several types are exhibited, and are representative of the varying circumstances under which these closets have been found efficacious. The bedroom cabinet commode, for instance, is so designed as to effectually disguise its object, and is equally suitable for house boats, ocean steamers, or in any position where space is limited. This pattern is made in American whitewood, teak, or mahogany, and when closed is 1ft. 6ins. square, and 1ft. 11ins. in height.

THE NORTH BRITISH PLUMBING CO., LTD., 15, CARTERET STREET, QUEEN ANNE'S GATE, WESTMINSTER, LONDON, S.W. STAND 15. ROW A.



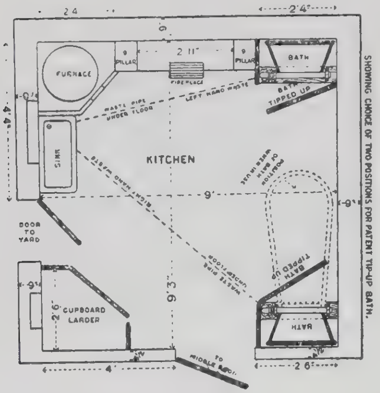
This exhibit includes a variety of interesting features, prominent among which is a working system of cast-iron drainage, with improved patterns of airtight inspection chambers, gulleys, etc., affording easy access, without risk of breaking the bolts.

Among novelties in plumbing should be noted the company's new system of jointing lead soil pipes by means of a cast-lead collar, thus doing away with the primitive and very ugly soldered joint.

The sanitary appliances for the house here shown are of a simple and efficient character. two kinds of flushing cisterns are exhibited, one worked with a "drip by drip" feed, and the other (electric, intended for use with pedestal closets) by pressing a button. The Mitchelite Petrol Air Gas Apparatus is worked by water pressure, and may be seen in operation. The Company's premises (here illustrated) were designed by Mr. W. W. Scott-Moncrieff.

The following is a list of sanitation works carried out by the North British Plumbing Co., Ltd.:—New Record Offices, Chancery Lane, W.C.; Boord's Brewery, Tooley Street; Brook's Club, St. James' Street; The Travellers' Club, Pall Mall; Overstrand Hall, Cromer. for Lord Hillingdon; the Liverpool and London and Globe Insurance Offices, Cornhill; the British Linen Bank, Threadneedle Street; Coutts' Bank, Strand; a House in Park Lane, W.; new offices, Kingsway, for W. Robinson; Oxhey Grange, Bushey, Herts; Chenies Street, Residential Chambers; the Institute of Mechanical Engineers, Storey's Gate; Clumber House, for the Duke of Newcastle; 19, Hyde Park Terrace, W.; 42. Brook Street, W.; Army and Navy Club, Pall Mall; the National Telephone Co.'s Offices, Victoria Embankment; the National Bank of Scotland, Nicholas Lane; the Guardian Assurance Co., Ltd., Lombard Street, E.C.; Lloyd's Bank, Cornhill; Holborn Restaurant; Quendon Hall, Newport, Essex; Park Hall, Towcester, Northants; the London, City and Midland Bank, Threadneedle Street; the Royal Dental Hospital, Great Portland Street, W.; etc., etc.

THE PATENT TIP-UP BATH CO. 31, BROAD STREET, BIRMINGHAM. STAND 33. ROW B.



Plan of Kitchen.

The economy of space resulting from the use of a bath which tips up on its end and stands (when not in use) in a cupboard of 1ft. 6in. projection only is very clearly demonstrated at this stand, where is exhibited a model of a workman's scullery, measuring 9ft. by 9ft. 3in., showing alternative positions for this description of bath.

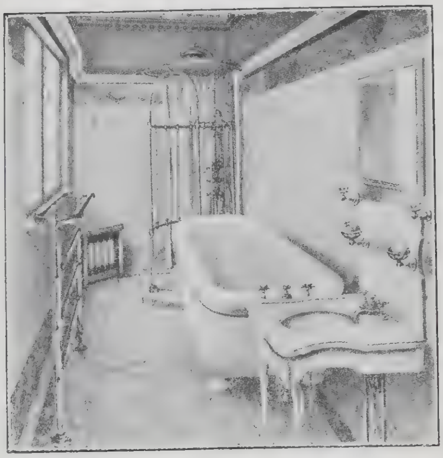
Architects who have been to Bournville Village and the many Garden City Estates in various parts of the country will remember seeing these baths.

Much ingenuity has been shown in the waste, which must take the discharged contents of a hinged bath, and yet be watertight in itself.

For use near the kitchen fire, in cottages or tenements where servants are not kept, these baths are especially valuable.

The following is a list of cottage estates and buildings (with the names of their architects) where "Tip-up" baths are in use:—The Bournville Village Trust, architect H. Tyler; The First Garden City Estate, Hitchin, architects H. Tyler and Messrs. Stanley Barrett and Driver; Model Cottage Exhibition, Newcastle-on-Tyne, architects, Messrs. White and Stephenson; Ideal Village, Bordesley Green; The Ideal Benefit Society, Birmingham; workmen's cottages for the Metropolitan Amalgamated Railway Carriage and Waggon Co., Ltd, Saltley, Birmingham, architect Chas. H Collett; Geo. Bell and Sons, Tottenham Hall, London, N., on private estate; etc., etc.

SHANKS AND CO., LTD. WORKS, BARRHEAD, SCOTLAND. LONDON OFFICES, 81, NEW BOND STREET, W. STAND 10. ROW A.



The exhibit at this stand is intended to illustrate more particularly Messrs. Shanks and Co.'s domestic sanitary appliances, as it is impossible in the limited space available, to represent the almost endless variety of fittings made by the company for schools, hospitals, prisons, asylums, steamships, etc.

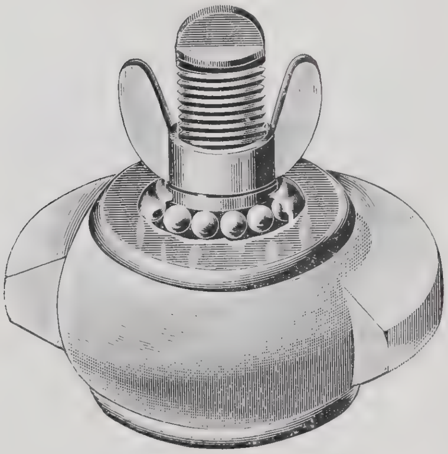
Architects should take note of the examples shown of the use of glass for canopies or enclosures in connection with spray baths, some of which have not been previously exhibited. In regard to the baths, attention is directed to specimens of cast-iron baths (porcelain enamelled, inside and outside), standing on marble sole plates, which represent the latest form of fitting.

An entirely new form of waste and overflow the "Eureka" is exhibited for the first time, and the attention of the profession is drawn to it. The lavatory basin, which is entirely free of metal parts, is formed with an overflow chamber at the back, communicating (by means of a discharge orifice at the bottom) with the basin. This chamber has a pull-up, hollow plug, and when the basin is full the overflow falls over a weir at the back, and is discharged through the plug into the trap and waste.

Among other interesting exhibits is a form of water closet (standing on a marble sole plate) operated by means of a pedal.

Shanks and Co., Ltd., have supplied sanitary appliances for the following buildings (names of architects in parentheses):—Waldorf Hotel, London (A. Marshall Mackenzie, F.R.I.B.A.); "Morning Post" offices, London (Mewès and Davis); Holborn Town Hall, London (Warwick and Hall); Cavalry Club, Piccadilly, London (Mewès and Davis); Edmonton Workhouse Infirmary, London (Stuart Hill); etc., etc.

THE WEBB LAMP CO., LTD., 11, POULTRY, AND 24, QUEEN VICTORIA STREET, LONDON, E.C. STAND 5. ROW A AND BAY 27 (GALLERY).



This firm exhibits a variety of specialities, among which are their patent sewer-ventilating lamps. These lamps have also been used to ventilate underground conveniences, and, according to locality, may be constructed to burn coal gas, petroleum, or kerosene.

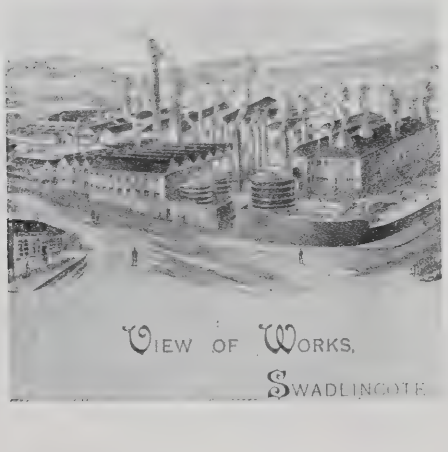
The anti-splash tap and hydrant combines several advantages, and can be quickly converted from an ordinary tap into a hydrant, by the use of interchangeable parts.

The "Kom" drain-testing plug, for testing drains by water, smoke, etc., can be used in all classes of drains, both in ware or iron, where it is desired to employ hydraulic pressure for cleansing purposes.

A novelty in burners is "Webb's self-intensifying gas burner," which is specially designed for the lighting of bridges, public streets, outside lamps, etc., where rough usage and vibration occur.

The patent galvo tap, and the galvo filter and water steriliser, as well as the patent silencer for w.c. cisterns, are exhibited at stand No. 5, Row A. At Bay No. 7 are shown the Webb system of sewer ventilation, consisting of apparatus for gas, as supplied for L.C.C. sewers; apparatus for the ventilation of underground conveniences, hospitals, etc.; apparatus to use petroleum, as supplied to the Corporations of Madras, Mysore, Bangalore, etc.; the Bolingbroke patent automatic non-return inlet ventilator, for sewage tanks, hospitals, etc.; Webb's patent "London" ventilator, as supplied to the London and other hospitals. Here, also, are Webb's patent sewer cleaner; the patent self-intensifying gas burner and incandescent burners for street lighting; special anemometers and high-pressure thermometers, the Kom drain-testing plug; and (exhibited for the first time) an automatic scrubber for washing oval or egg-shape sewers.

JAMES WOODWARD, LTD., SWADLINCOTE. LONDON OFFICE, 66, VICTORIA STREET, WESTMINSTER. STANDS 242 AND 243. ROW P.



Messrs. James Woodward's Anchor Works, Swadlincote, were started in 1790 for the manufacture of firebricks. In 1857 the works were extended for the production of stoneware pipes, and subsequently further extensions were made for the manufacture of glazed bricks and enamelled sinks and sanitary ware.

The exhibits show on what lines and to how great an extent the firm has developed. The glazed bricks are in an astonishing variety of agreeable colours, ranging from ivory white to chocolate and black, with a dozen intermediate tints. The patterns are even more numerous, and seem to anticipate every possible requirement of shape.

The vitrified brown glazed stoneware includes many varieties of pipes, large and small, simple and complex, junctions, tapers, elbows, syphons, traps, gullies, and air-bricks.

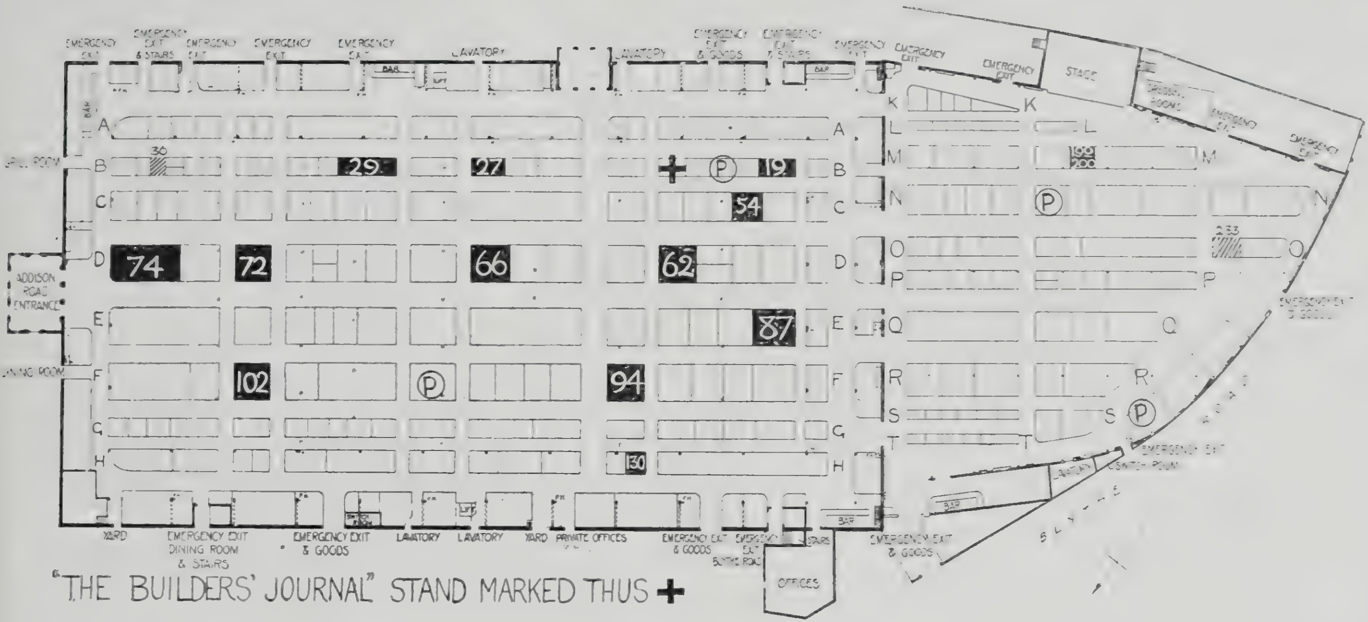
The firm's patent double-seal pipes, and the "Archer" improved patent jointed pipes, have been extensively adopted for the sanitary arrangements at many large hospitals and other public institutions; and kitchen sinks with special fittings, lavatories, and trough closets for public schools, etc., form a special interesting section of the firm's catalogue.

Special attention may be drawn to the high finish of Woodward's "Apex" salt-glazed bricks, chimney tops of many patterns, round, octagonal, square, and oblong, severely plain, or highly ornamented, offer wide scope for choice.

Messrs. Woodward's lavatories, urinals, pedestal closets, and sanitary ware in general, are of comprehensive variety in form, decoration, and purpose, and form a most interesting exhibition that in a manner is complete in itself, and is almost worth a special visit

SECTION NINE.

Paints. Enamels. Distempers. Stains. Wood Preservatives. Wall Papers. Damp Preventatives.



"THE BUILDERS' JOURNAL" STAND MARKED THUS ✚

Section IX.—PAINTS.

The following firms are noticed under this section and their stands are blacked in, he numbers in white :—

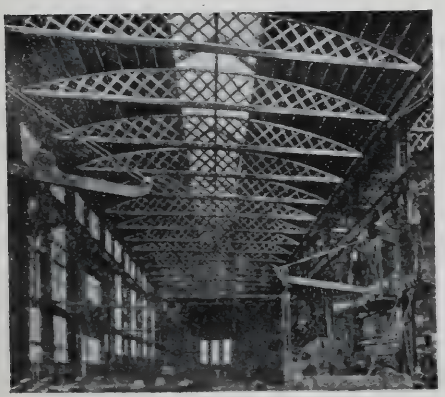
		Anderson, D., and Son, Ltd., p. 397.
130	H	Carson, Walter, and Sons, p. 398.
199, 200	M	Corsite Sales Co., Ltd., (The), p. 398.
72	D	Emdeca Sanitary and Artistic Metal Decoration Co., Ltd., p. 398.
[illegible]	E	Gross, Sherwood and Heald, Ltd., p. 398.
94	F	Major and Co., Ltd., Hull, p. 399.
19	B	Peters, C. A., Ltd., p. 399.
66	D	Pinchin, Johnson and Co., Ltd., p. 399.
102	F	Ripolin, Ltd., p. 399.
74	D	Sissons Bros. and Co., Ltd., p. 400.
54	C	Thornley and Knight, Ltd., p. 400.
27	B	Vickers, Archibald, p. 400.
62	D	Wilkinson, Heywood and Clark, Ltd., p. 4[illegible].

Messrs. Thos. Parsons and Sons' paints are shown on walls at the stands of Clark and Co., 21 B.; the Gypsum Mines Co., Ltd., 277 wall space annexe; the British Uralite Co., 215 N.; and Candy and Co., Ltd., 99 F, indicated on plan by the letter P within a circle.

The following firms are noticed in other sections, but are showing exhibits connected with this one. Their stands are indicated by hatching :—

36	B	Aerograph Co., Ltd. (Paint Spraying Apparatus), p. 353.
233	O	Guild of Decorators Syndicate, Ltd., (The), (Painted Decoration), p. 391.
43	B (Gallery)	Ronuk, Ltd., (Floor Polish), p. 351.

D. ANDERSON AND SON, LTD., LAGAN FELT WORKS, BELFAST, AND ROACH ROAD WORKS, OLD FORD, LONDON, E. STAND 29. ROW B.



This firm's exhibit takes the form of a rustic bungalow, in which three of their specialities are more particularly exemplified. These are the "A.W.P." washable water paint, Stoniflex roofing felt, and Sideroleum wood preservative. In regard to the latter, its pleasant nut-brown colour may be seen on the outer timbers, and its usefulness as a protection against decay, fungus, and insects has been proved by cooling-tower makers, builders, estate agents, etc.

Stoniflex roofing felt, made in three qualities, may be employed for general work as a permanent roof covering, and for lining and insulating buildings.

On the inside of the bungalow there are specimens of the "A.W.P." water paint, which is not a mere distemper made of whiting, size, and a little colour, but is a real paint with a fine opaque body, presenting a smooth egg-shell finish. It has the further merit of not rubbing off on to one's clothes, and when soiled or dirty can be washed. This is easily demonstrated, and may be proved to the satisfaction of visitors.

The firm show also their Siderosthen anti-corrosive paint for protecting every description of iron and steel work; Sideroleum wood preservative, which is nut-brown in colour, and is used by cooling tower makers, as well as by builders and estate agents; slag wool (silicate cotton), loose, and made up in various forms for insulating, deadening, fire-proofing, and similar purposes; felts for roofing, lining, damp-proofing, and for covering permanent and temporary buildings; the Stoniflex damp-course (in three qualities), which is made with refined Trinidad bitumen; and Anderson's wooden lattice and other roofs, water tanks, etc.

WALTER CARSON AND SONS, GROVE WORKS, BATTERSEA, LONDON, S.W. STAND 130. ROW H.

This firm exhibits a representative collection of colours, paints, varnishes, etc., including several specialities such as muraline, vitrolite, japolite, La Belle enamels, and wood preservative.

Muraline is a washable water paint, sold in the form of a dry powder, which, when mixed in equal proportions with water, can (with the exception of greens), resist lime, and may be applied on new plaster.

Vitrolite calls for mention, being made without white lead, of various pigments (chemically neutral) blended with oils treated to ensure elasticity and toughness. This paint is specially adapted for use in horticultural buildings.

La Belle enamels are sold in 32 distinct colours, and Bath enamels in 4 shades.

Carson's wood preservative can be obtained in green and two shades of brown.

Japolite is an elastic, brilliant, and durable Japan white for the highest class of external and internal decoration. It has great covering power, and flows easily under the brush, leaving a brilliantly smooth surface.

Vitrolite is largely used for the outside and inside of greenhouses, conservatories, and garden frames, and is recommended in preference to white lead for every class of work.

The firm's wood preservative is a combined stain and protective agent which penetrates the wood and effectually prevents decay, while at the same time giving the work a very pleasant appearance.

Estate agents and engineers, as well as architects, builders, and decorators, will find much to interest them among the various exhibits of this old-established firm.

THE CORSITE SALES CO., LTD., COUNTY BUILDINGS, CANNON STREET, MANCHESTER. STANDS 199 AND 200, ROW M.

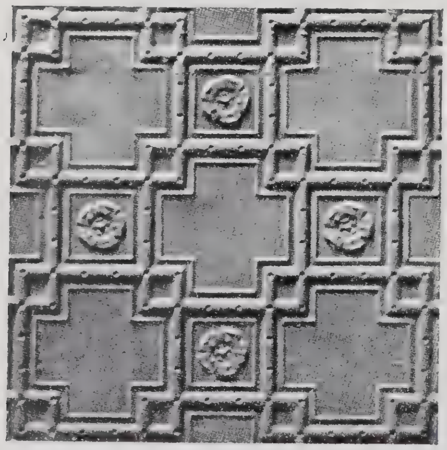
"Corsite" is the particular manufacture of this company, and is made in three grades. No. 1 is claimed to be a permanent cure for dampness. It possesses considerable covering power, something like 50 square yards to the gallon, and is no thicker than water. The manufacturers frankly warn users that the instructions—which are very simple—must be strictly followed if the result is to be certain. No. 2 is a liquid preparation for the prevention of oxidisation and corrosion of metals. In positions exposed to the atmosphere, the company recommends the coating of the metal with paint after the application of "Corsite." Subsequent coats of paint may then be applied without cleaning and scraping the first one, as corrosion is absent.

Corsite Primer is the third grade, and is intended as a preparatory coat prior to the application of ordinary paint.

The Corsite Sales Co.'s preparations have been used in the following buildings:—G.P.O., Blackburn; Fire Station, Blackburn; Town Hall, Blackburn; L. and Y.R., Manchester; G.C.R., Gorton; Cheshire Lines Railway, Liverpool; Braddock and Sons (of Meters, Ltd.), Oldham; Binns, Burnley (own house); Corporation Schools, Liverpool; Frank Hay, Seal Street; Corporation Tramways, Southport; Corporation Gas Works, Oldham; Corporation Gas Works, Burnley; Corporation Gas Works, Bolton; Corporation Gas Works, Blackburn.

Corsite No. 3 is a preparation for which it is claimed that, when applied to woodwork, it prevents and checks the ravages of dry rot and that when used on resinous woods it prevents cracking and blistering.

EMDECA SANITARY AND ARTISTIC METAL DECORATION CO., LTD., 97, QUEEN VICTORIA STREET, LONDON, E.C. STAND 72. ROW D.



The "Emdeca" Decorations are so constant a feature at the various Building Trades Exhibitions, and are so well known to the profession, that a special description of them is hardly necessary. They are displayed at this stand in a variety of pleasant designs, suitable for as many purposes, such as bathrooms, kitchens, lavatories, hotels, etc. These enamelled zinc sheets, which have been in use for a number of years, are of considerable thickness, and are fixed to the walls with paste (mixed with varnish). The walls must be perfectly dry, however, or the result will be unsatisfactory.

The company also exhibits "Stelonite" Stamped Steel Ceilings, which are a speciality. These are mostly designed so that they form a series of squares, which are nailed to battens of corresponding spacing. Steel cornices may be also had, and are used in conjunction with the ceilings.

The following is a list of some of the buildings where "Emdeca" has been used:—Royal Infirmary, Liverpool; the London Hospital, Whitechapel; St. Bartholomew's Smithfield; Guy's Hospital, Borough; Hoxton Asylum, Hoxton; Ophthalmic Hospital, Glasgow; Hemsworth Infirmary, Wakefield; West Sussex County Asylum, Chichester; Mill Road Hospital, Liverpool; Midland Counties Asylum; Mansion House, York; Eastern Counties Asylum; Burton Orphanage; St. Mark's College, Chelsea; Temperance Hospital, Hampstead; Charing Cross Hospital; German Hospital, Dalston; Poplar Hospital; Royal Infirmary, Glasgow; Lady Warden Convalescent Home; Pine Wood Sanatorium, Woking; Hazlewood Asylum, I. of W.; St. John's College, Leatherhead; Commercial Sale Rooms, Mincing Lane; Westminster Public Baths; The Baltic Shipping Exchange, St. Mary Axe; etc., etc.

GROSS, SHERWOOD AND HEALD, LTD., ST. GEORGE'S WORKS, LONDON BRIDGE, LONDON, S.E. STAND 87. ROW E.

This firm of varnish, colour, and enamel manufacturers can claim an experience of 130 years, and must therefore be one of the very oldest in the trade. Their very attractive stand has been designed in the ever-popular Georgian style. Such handsome buildings, always an agreeable as well as a decidedly appropriate feature of a Building Exhibition, are this year apparently more numerous and more artistic than ever, and in the aggregate are the making of the exhibition as a mere spectacle. But they are certainly as useful as they are beautiful; for, in the case of such exhibits as those under notice, they afford invaluable scope for the practical demonstration of quality. The stand is decorated in the firm's flat and glossy Rystolite enamel in a very pale shade of grey, that is very largely in demand for schemes of decoration. There are very attractive exhibits of flat and glossy Rystolite enamel in colours and tints, as well as some exceedingly fine specimens of Messrs. Gross, Sherwood, and Heald's varnishes, as applied to various uses. The floor is treated with oil varnish stain.

The Astrium paint, of which samples are exhibited, has been recently used at the following places:—Buckingham Palace, St. James's Palace, Houses of Parliament, Tower of London, The Royal Mint, Royal Courts of Justice, His Majesty's Prisons, Prime Minister's and Home Secretary's official residences, British Museum, Royal College of Science, Victoria and Albert Museums, Hertford House, Natural History Museum, General Post Office, Inland Revenue Offices, County and Borough Councils, Harrow Schools, Kingston, Chatham, Woolwich, and Chelsea Barracks. For a list of the places at which the exhibitors' specialities have been used, apply to their address.

MAJOR AND CO., LTD., HULL. STAND 94. ROW F.

A very practical and very interesting way of demonstrating the merits of a paint, stain, or varnish, is to display it in position as applied to a building. This is the method that Messrs. Major and Co., like many other wise exhibitors, have consistently adopted.

The pavilion they have erected is certainly one of the most picturesque among the many interesting structures in the Exhibition, and has rather a special interest of its own.

The building which constitutes this firm's exhibit was originally erected as an office for the Garden City Tenants Co., at the Letchworth Cottage Exhibition, held in 1907, and illustrates the effect of "Solignum," as a wood preservative and stain when applied on either external or internal woodwork. The "Solignum" is shown left plain, and also can be seen after being varnished and beeswaxed.

On the verandah a collection of very good models of farm buildings, a railway station, and a "modern" villa, demonstrates the variety of different classes of work to which "Solignum" may be advantageously applied.

Specimens of wood are exhibited (in cases) showing how "Solignum" has resisted the attacks of while ants in tropical countries and prevented destruction by dry rot in our own.

Solignum has been used recently at the following buildings:—Addington Court Golf Pavilion, Surrey, A. Goldsmith, Esq., architect, 63, Falkner Street, Manchester; London and Middlesex Rifle Association Pavilion, Bisley, C. E. Lancaster Parkinson, Esq., A.R.I.B.A., architect, 44, Bedford Row, London, W.C.; Copthall Restaurant, Copthall Avenue, London, P. Morley Horder, Esq., architect, 148, New Bond Street, London, etc., etc.

C. A PETERS, LTD., DERBY. STAND 19. ROW B.

Messrs. Peters are the makers of "Carbolineum Avenarius," which as a wood preservative has a reputation of over 25 years' standing. Its general application is shown in the wood pavilion which forms this firm's exhibit, where a variety of other specialities can also be inspected.

A preparation of "Carbolineum," sold under the name of "Sotor," is specially adapted for use in the case of timbers which are subject to the attacks of sea-worms. Among these the *teredo navalis*, whose ravages have caused great destruction in the past, has been successfully resisted.

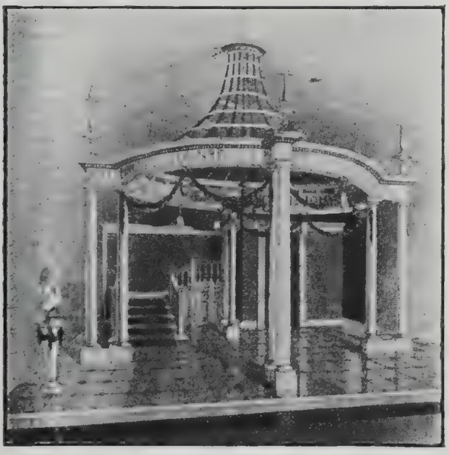
The "Carbotron" portable stove (for burning "Carbotron" fuel) is also shown. It is claimed for this fuel that it gives off neither smoke, smell, nor fumes, and that it leaves no residue after consumption. For these reasons the stoves are without flues.

The Teredo has been known to destroy, in an incredibly short time, a whole range of extensive timber docks, and even to cause the sinking of large ships. Carbolineum Avenarius not only prevents the ravages of this very formidable pest, but gives woodwork a much longer career of usefulness than would be possible to it if inefficiently protected.

This preparation is regarded by estate agents as one of their most trusty resources. They use it extensively in a large number of applications to different varieties of woodwork, particularly in the many and various instances in which posts have to be sunk into the ground.

"Carbolineum" is used by the Admiralty, the War Office, the Post Office, Telegraph Service; also the leading architects, surveyors, corporations, contractors, and estate agents in the United Kingdom, and all over the world.

PINCHIN, JOHNSON AND CO., LTD., MINERVA HOUSE, BEVIS MARKS, LONDON, E.C. STAND 66. ROW D.



The chief product of this firm is "Minerva" Paint, made of guaranteed ingredients in 24 standard colours, which have been very carefully selected for their general utility in ordinary circumstances. Each of these colours can be reduced down to four lighter shades by admixture (in specified proportions) with "Minerva" Gloss White, the result being that the user has at his disposal a very wide range of distinctive tints, which he can always match at any future time by once more adopting the same method of mixing. The system is an ingenious one, and should save the decorator both time and trouble.

The paints are equally adapted to inside or outside work, but it must be pointed out that the best results are only obtainable by careful adherence to the printed instructions.

Other specialities of this firm are "Venus" Copal Varnish, "Deydo" Water Paint, "Silveroid" (a silver paint), and "Syronite," which latter is described as a rust preventative.

The following are some of the firms regularly using these productions: Hotels—Ritz, Carlton, Savoy, Langham, Claridge's, Waldorf, Curzon, Midland Grand, Hyde Park (London); Midland, Manchester; Midland, Derby; Queen's, Leeds; Adelphi, Liverpool; Grand, Birmingham; Grand, Eastbourne; S.W.R., Southampton; Metropole, Brighton; and many others. Shipowners—Cunard Line, Union-Castle Line, Prince Line, Royal Mail S.P. Co., Bibby Line, Ocean S.S. Co., Orient Line, Caucasian S.S. Co., American Line, Hamburg-American Line, Brocklebank Line, Pacific Steam Navigation Co., and many others. Railways—Great Eastern; Great Central; Great Northern; Central London; Great Southern and Western, etc., etc.

RIPOLIN, LTD., 110, FENCHURCH STREET, LONDON, E.C. STAND 102. ROW F.

Ripolin
A PAINT READY FOR USE
on Wood, Metal, Plaster, Stone, etc.
RIPOLIN
TRADE MARK

Ripolin has been on the market for some years past, and is generally recognised to be a high-class paint, possessing qualities of durability which make it of especial value for external work. It is equally applicable to internal work, and when properly used produces an exceedingly smooth and beautiful surface.

This exhibit comprises four compartments or rooms, consisting respectively of a hall, a "Georgian" interior, a bathroom, and an office, in each of which the distinctive requirements of the case—so far as painting goes—are successfully met. Here can be inspected specimens of Ripolin enamel paint (gloss and flat), and the application of Ripolin gold bronze, etc.

This firm manufactures various other specialities, such as Bath Ripolin, black (for blackboards), and silver paint.

In the hall of the pavilion, crimson doors are in rich contrast to the brilliant white columns and surrounding cream-stone surfaces, relieved by a touch of Ripolin gold.

The Georgian interior shows the soft and pleasing effects obtainable with the flat varieties of Ripolin.

In the bathroom, to which the exhibitors seem to have devoted special attention, the dazzling white gloss on the panelling, surmounted by a touch of delicate colouring in flat Ripolin on the frieze and cornice, produces an exquisite finish.

In the fourth compartment, which is used as an office for the reception of enquirers, representatives of the firm are ready and willing to give full particulars with respect to the qualities and uses of Ripolin, which, having been before the public for several years, has been used on almost innumerable important works.

SISSONS BROTHERS AND CO., LTD., HULL AND LONDON. STAND 74. ROW D.

The proprietors of Hall's sanitary washable distemper have here erected, from designs by Mr. T. Gordon Jackson, architect, a small cottage, with porches at front, side, and back, and containing a living-room and a bedroom, both fully furnished, the chief object being, of course, to demonstrate the well-ordered use of the firm's specialities. Thus the roughcast walls are covered with cream-colour distemper; the wood framing with green paint ("Aperfectol"); the gable timbers with the preservative stain known as Rustikol; while the doors and the window-frames are finished with Sisco white Japan enamel. The inside walls of the living-room are coloured with flamingo red distemper; the posts and beams are toned with Sissons's dark oak turpentine stain; while the doors, windows, skirtings, seats, etc., are finished in the firm's Orientolac white enamel.

In the bedroom, the "note" is a restful tone of blue, the walls being coloured with Hall's distemper, while the posts and beams are stained with the same dark oak turpentine stain that is used so effectively in the living-room; but the furniture in the bedroom is stained mahogany colour, whereas for that in the living-room the oak turpentine stain is used.

Hall's distemper has been used in Buckingham Palace, St. James's Palace, the Tower of London, the Royal Mint, Chelsea Hospital, the War Office, the Admiralty, the General Post Office, and innumerable other public buildings.

THORNLEY AND KNIGHT, LTD., BORDESLEY GREEN ROAD, BIRMINGHAM. STAND 54. ROW C.

The beauty and variety of the paints shown at the present Exhibition is an indication of the enormous strides that have been made within recent years in the manufacture of such goods. The manufacture of paints and varnishes has become an intensified science, and many of our foremost chemists are engaged in it, and are making their presence felt in an all-round improvement in the quality and appearance of the product, which they study from every point of view with the acumen of the scientifically trained expert.

At this stand may be seen specimens of Messrs. Thornley and Knight's snow-white and French grey Japans, applied to flat surfaces, over three coats of white lead paint, lightly sand-papered. In the case of two of the columns, the finishing coat of Japan has been flatted down to an egg-shell gloss.

An interesting exhibit is an oak cupboard door varnished by this firm in 1866, and still of good appearance.

A speciality which may be particularly noticed is aluminium Japan, for which great durability and heat-resisting qualities are claimed by the manufacturers.

Additional exhibits include vermilion substitutes, permanent greens, special graining colours, transparent wood fillers, non-poisonous white, flat enamels, etc.

ARCHIBALD VICKERS, 125, VICTORIA STREET, LONDON, S.W. STAND 27. ROW B.

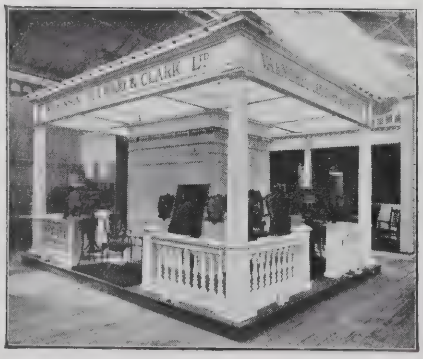
What has been said above with reference to the general improvements in the processes of paint manufacture receives additional confirmation from the exhibits on this stand. A further significant indication of the thoroughness of the knowledge brought to bear on the manufacture, and of the fine enthusiasm of the experts engaged in it, is found in the transactions of the Paint and Varnish Society, at whose meetings, as our own pages have repeatedly borne witness, the papers that have been read, and the ensuing discussions on them, have revealed an amount of keen intelligence and truly philosophical investigation that is highly creditable to the industry as a whole, and that goes far towards explaining how it is that during the past few years such excellent improvements have been effected.

The "Ay-Vee" brand of pure prepared paint is made in sixteen stock colours, exclusive of black, and this stand is entirely devoted to their display. The manufacturer, in order to substantiate the claims he makes for his covering capacity and obliterative qualities has, for the information of visitors, adopted the convincing method of practical demonstration. Those interested may see the colours being applied. The secret of the gloss is due to the special mediums employed, and the preparatory treatment they undergo during the process of manufacture. It should be noted that this gloss is obtained without the admixture of varnish.

This firm's paints are being largely used by builders on the south coast, and they were also used on the Duke of York's School at Dover, for the Board of Works.

Architects on the look-out for a high-class paint at a low figure should visit this stand.

WILKINSON, HEYWOOD AND CLARK, LTD., 7, CALEDONIAN ROAD, LONDON, N. STAND 62, ROW D.



This exhibit comprises a full-size model of a reception room (standing on a raised stage with a surrounding balustrade), finished with Falconite white enamel, except for the panels, which are treated with the Company's well-known colours and paints. Here are shown various coats of arms painted on mahogany shields, and varnished with Italian oil varnish. The heraldic decorations are very well done, and are not transfers. Other shields are displayed, in which are employed various shades of permanent violet, which is a recent production of this firm.

Each specimen of work on this stand bears a conspicuously displayed number, and the methods employed in securing the results shown can be readily referred to, by turning up the corresponding number in a brochure which fully describes the exhibit. This may be had on application at the stand.

Four massive columns support a bold entablature, suitably ornamented, with the company's name in gold lettering. The base is made up of turned balustrades and model posts, and the wall spaces are broken up into dados, fillings, and friezes, and enriched with carvings.

Six panels are shown illustrating simple and artistic schemes of house decoration, which can be easily reproduced by the stencilling process with the special distemper colours manufactured by this firm.

THOMAS PARSONS AND SONS, MITCHAM, SURREY.

This firm's "Lacreite" and "Endelline" enamels have been used in the painting of the following exhibitors' stands:—The Gypsum Mines Co.; Messrs. Clark and Co.; The British Uralite Co.; Candy and Co., Ltd., The Coatostone Decoration Co.

Carbolineum Avenarius

REGD.

Wood Preservative
Antiseptic
and Disinfectant

Undoubtedly the Best Wood Preservative known
Cheaper and more effective than paint.

Invaluable for the protection of Wooden Buildings, Fences, &c.
Gives a nice nut-brown colour.
Horses will not bite wood treated with it.
Has been proved a success for the last twenty years in this Country and is used regularly on many of the largest Estates.

C. A. PETERS, Ltd., DERBY.
116, NEWGATE STREET, LONDON, E.C.
And 8, CASTLE STREET ARCADE, LIVERPOOL.

Agents for Scotland:
The Glasgow Patents Co. Ltd., 120, Great Wellington Street GLASGOW
Agents for Nottinghamshire and Lincolnshire:
W. Robinson, (Nottingham) Ltd., 7 & 9, Victoria Street, NOTTINGHAM
Agents for Leicestershire:
W. Robinson, (Nottingham) Ltd., Churchgate, LEICESTER

L. & C. HARDTMUTH'S
KOH-I-NOOR PENCIL

Is the most economical Pencil made. It lasts six times as long as an ordinary pencil. But it is the velvety smoothness of the lead that is the great charm of the Koh-I-Noor. There is no other pencil that nearly approaches its quality. The lead of the Koh-I-Noor is specially prepared by a perfected process which gives it a firmness yet delicacy of touch that cannot be imitated. The Koh-I-Noor is made in seventeen degrees to suit all pencil purposes.

Koh-I-Noor Pencils are **4d.** each, and **3s. 6d.** per dozen, everywhere. Of Stationers, Artists' Colourmen, Photographic Dealers, &c. Booklet free from

L. & C. HARDTMUTH,
12, Golden Lane, London, E.C.

KOH-I-NOOR TRACING CLOTH

Is a stout and substantial cloth possessing every advantage for the drawing room. Its surface is smooth and clear, free from blotches. Does not tear or break. Is transparent enough for the finest work. Erasures may be freely made without causing the ink to run. Is excellent for giving impressions by process.

THE GREATEST SATISFACTION IN USING THIS SPECIALITY IS FOUND IN ALL DRAWING OFFICES.

Of Stationers, Artists' Colourmen, Photographic Dealers, &c.

L. & C. HARDTMUTH, 12, Golden Lane, London, E.C.

BUILDING TRADES' EXHIBITION.

OUR STAND IS No. 16 ROW B.

IN THE SURVEYORS' SECTION.

WE hope to receive a visit from you. We are showing many new things of interest to all SURVEYORS and DRAUGHTSMEN, and cordially invite your inspection.

LINEFAST PHOTO COPIES ON TRACING CLOTH,

Equivalent to Hand Made Tracings.
Sample print free.

ORDOVERAX PHOTO REPRODUCTIONS.

and

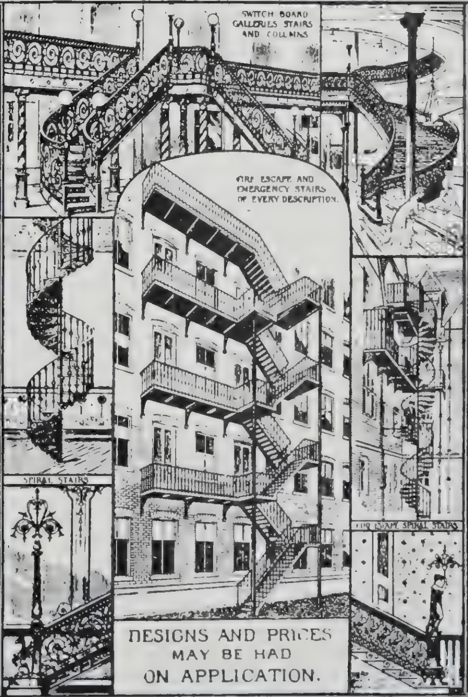
EVERYTHING FOR THE DRAWING OFFICE.

B. J. HALL & CO., LTD.,
HEAD OFFICE,
39, VICTORIA ST., LONDON, S.W

MACFARLANE'S CASTINGS

SHARP CLEAN AND FULL OF CHARACTER.

RAIN-WATER, SOIL, DRAIN, HOT-WATER, VENTILATION AND CABLE PIPES ETC. R.W. HEADS. RIDGINGS. TERMINALS. BELFRIES. CLOCKTOWERS. RAILINGS AND GATES. STANDARDS. BALUSTERS AND NEWELS. PANELS AND GRATINGS. FLOORPLATES. STRAIGHT, SPIRAL AND EMERGENCY STAIRS &c. BENCH, TABLE AND SEAT STANDARDS. BATHS, SINKS AND WASH-HAND BASINS. VENTILATORS.


SWITCH BOARD GALLERIES STAIRS AND COLUMNS
FIRE ESCAPE AND EMERGENCY STAIRS OF EVERY DESCRIPTION.
SPIRAL STAIRS
FIRE ESCAPE SPIRAL STAIRS
DESIGNS AND PRICES MAY BE HAD ON APPLICATION.

URINALS, WATERCLOSETS AND ALL KINDS OF SANITARY CONVENIENCES. LAMP PILLARS AND BRACKETS FOR GAS AND ELECTRICITY. COLUMNS. BRACKETS. SPANDRILS. WINDOWS. ROOFS AND ROOF SIGNS. BANDSTANDS. SHELTERS. PORCHES. CONSERVATORIES. STABLE, BYRE AND HARNESS FITTINGS &c. BALCONIES. VERANDAHS. FAÇADES. FOUNTAINS. HORSE TROUGHS. BRIDGES. PARAPETS. ENRICHMENTS.

WALTER MACFARLANE & Co.
SARACEN FOUNDRY
GLASGOW

PATENTEES AND MANUFACTURERS OF ALL KINDS OF ARCHITECTURAL, SANITARY AND CONSTRUCTIONAL WROUGHT AND CAST IRONWORK. ESTABD. 1850.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application.

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc .. 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Dartmouth.—For erection of premises to be known as Stapledon House, South Town, Dartmouth, for the St. Petrox Trustees. Mr. Alec. W. Percival, P.A.S.I., architect, Plymouth :—

Wilkins and Sons, Bristol	£1,364	0	0
Bovey and Son, Torquay	1,297	0	0
Ferris and Heyden, Dartmouth	1,144	10	0
R. C. Pillar, Dartmouth	1,110	0	0
F. Stanbury, Plymouth,	1,097	10	0
R. T. Pillar, Dartmouth	1,095	0	0
S. Roberts and Co., Plymouth	1,095	0	0
H. Anderson, Dartmouth	1,075	0	0
Triggs and Watts, Dartmouth	1,072	0	0
J. Back,* Dartmouth	984	10	0

*Accepted.

Dodworth, Yorks.—For erection of new Council schools, for the Dodworth Urban District. Accepted tenders :—Builders, G. Porter and Sons, Barnsley, £2,391; oinery, G. Porter and Sons, £1,307; slating, Dawber, Townsley and Co., Barnsley, £318; plumbing, J. Richardson, East Ardsley, £606; plastering, J. Bancroft and Sons, Halifax, £170; painting, Self and Co., Bradford, £75 5s. 5d.

Fenton, Staffs.—For the erection of a fire brigade station, foreman's residence, etc., for the Urban District Council :—

Mould	£1,535	0	0
Wardle	1,450	0	0
Beckett	1,339	1	8
Challinor and Hughes	1,330	0	0
Ball and Robinson	1,290	0	0
Caulcott	1,276	0	0
Walters	1,375	0	0
Cooke	1,261	10	0
Chatfield	1,240	0	0
Wilton	1,207	0	0
Goodwin	1,200	0	0
Heath	1,188	0	0
Bennion	1,177	8	0
Tompkinson and Bettelley,* Longton	1,175	0	0
Yoxall	1,165	0	0

*Accepted.

Haslemere.—For the erection of a house at Haslemere, for T. Castleman, Esq. Frederick J. Hodgson, and William Symmonds, architects, 100, High Street, Guildford :—

Chapman, Lowry and Puttick, Ltd.	£594	0	0
C. Ticehurst	550	0	0
F. Milton and Sons, Witley	539	0	0
H. Austin	523	10	0
Haslemere Builders, Ltd.	509	0	0
R. Smith	505	0	0
N. Holden and Son	495	10	0
C. Doughton	495	0	0
J. Marshall,* East Liss	447	0	0

Rest of Haslemere.

*Accepted

Hinckley.—For the erection of public baths at the rear of the Council Offices, Station Road, for the Urban District Council. Mr. E. H. Crump, A.M.Inst.C.E., engineer and surveyor, Council Offices, Hinckley :—

Moss and Sons	£2,592	15	0
A. Palmer	2,589	0	0
A. Faulks	2,569	12	6
Kelly and Sons	2,562	4	9
Dallow and Sons	2,532	4	9
C. Flavell	2,424	12	0
A. Jewell	2,413	7	6
W. Sharpe	2,409	17	7
Goodman and Sons	2,392	17	9
T. Hickman	2,388	17	6
S. Chaplin	2,377	0	0
T. Rowley	2,365	17	2
G. Greaves,* Hinckley	2,348	11	0
G. Fox	2,324	7	10

*Recommended for acceptance.

London, W.—For erection of new ice-making works, Paddington. Mr. H. Phelps Drew, architect, King Street, Covent Garden, W.C. :—

Higgs and Hill	£11,484
Thomas and Edge	11,467
Spencer, Santo and Co.	11,055
King and Son	11,044
Prestige and Co.	10,987
Richards and Co.	10,883
F. G. Minter	10,695
Ashby and Horne*	10,952

*Accepted.

London, W.—For erection of shop premises at 73, Marylebone Lane, W. Messrs. Frank Chown and Sheffield, architects, 2, Prince's Street, Hanover Square, W. :—

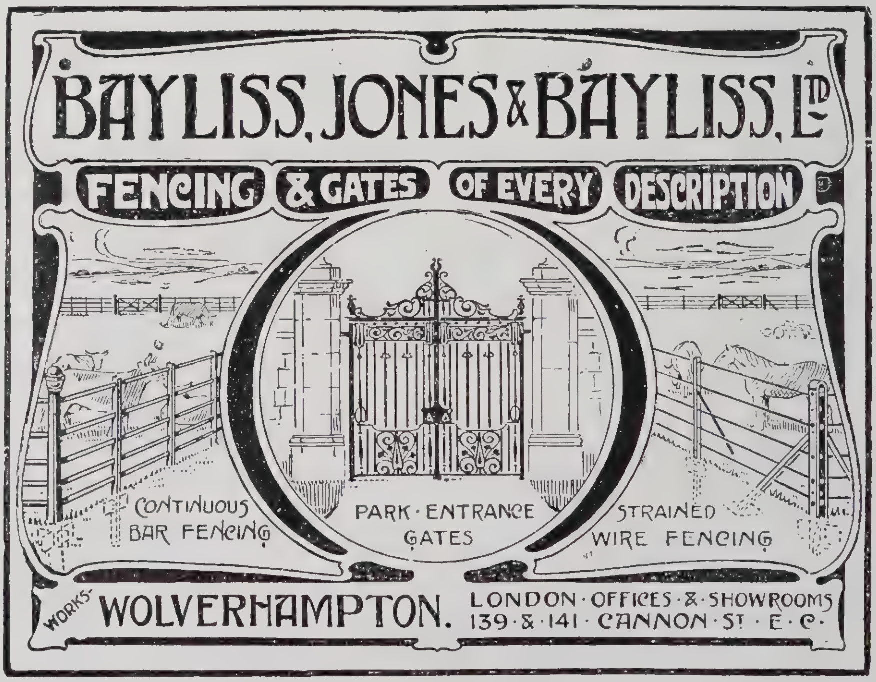
Rowe and Co.	£938
G. Parker and Son	819
C. A. Sedgwick	799
B. E. Nightingale,* Lambeth	796

*Accepted.

(*Tenders continued on page viii.*)

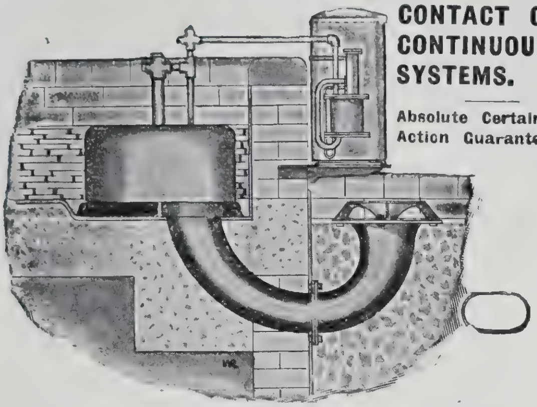
ROOFING SLATES.
Velinheli, Penrhyn and Westmoreland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

THE
"Builders' Journal"
STAND
AT THE
BUILDING
EXHIBITION,
Olympia,
IS
No. 23, Row B.


BAYLISS, JONES & BAYLISS, Ld
FENCING & GATES OF EVERY DESCRIPTION
CONTINUOUS BAR FENCING
PARK ENTRANCE GATES
STRAINED WIRE FENCING
WORKS WOLVERHAMPTON.
LONDON OFFICES & SHOWROOMS 139 & 141 CANNON ST E.C.

FOLDING PARTITIONS. 2/- ft. Super.
REVOLVING SHUTTERS. 1/- ft. Super.
Hartley Bros., GORTON, MANCHESTER.

BACTERIAL TREATMENT OF SEWAGE.



CONTACT OR CONTINUOUS SYSTEMS.

Absolute Certainty. Action Guaranteed.

PATENT ALTERNATING SYPHONS.

PATENT TIMING SYPHONS
(requiring no auxiliary brick chambers).

PATENT ROTARY DISTRIBUTORS
FOR TRICKLING FILTERS.

PATENT SEWER FLUSHING SYPHONS.

BURN BROTHERS,
Sanitary Engineers,
3, Blackfriars Rd., LONDON, S.E.
ALSO AT EDINBURGH.

CARRON

"Esto" & "Radiant" Firegrates

are thoroughly up-to-date, labour and fuel saving, they consume every particle of coal, diffusing in exchange a genial warm and healthy glow.

They are built on scientific lines—the low concave shaped bottom grate being the most perfect arrangement for effecting complete combustion.

Grand Prix Franco-British Exhibition.

Write for No. 8 "Esto" and "Radiant" folder.

THE "ESTO" FIRE.

CARRON COMPANY
INCORPORATED BY ROYAL CHARTER 1773
CARRON, STIRLINGSHIRE.

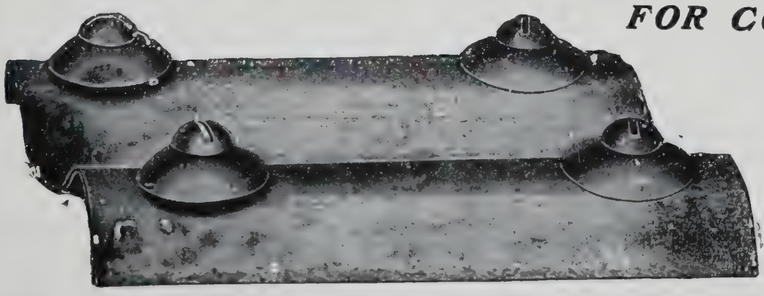
HOSPITALS, INFIRMARIES, SCHOOLS, &c., REQUIRE
MANCHESTER STOVES, GRATES, & VENTILATORS.
E. H. SHORLAND & BRO., Drake Street Works, MANCHESTER.

LIGHTNING CONDUCTORS
Supplied, Erected and Tested. Chimney Shafts Restored, &c.
J. LEWIS, 5 & 6, Great Winchester Street LONDON, E.C.
TELEPHONE No. 3053 CENTRAL.

BUTTERS BROS., CRANES for CONTRACTORS
WATERLOO STREET, GLASGOW.

"LIMPET" PATENT BOLTS & WASHERS
FOR CORRUGATED IRON SHEETS.

"There is no doubt in our mind that they ought to be regularly specified where iron sheeting is used."—*Vide* BUILDERS' JOURNAL.



Their great feature is the way in which they adjust themselves to the corrugation and make an **absolutely watertight joint.** They also retard the corrosive action in Galvanized Sheets and combine other advantages.

EXCLUSIVELY ADOPTED BY THE INDIAN GOVERNMENT, THE LEADING RAILWAYS AND MANY OF THE LARGEST MANUFACTURING CONCERNS IN ENGLAND AND THE COLONIES.

PRICE'S PATENT

The latest and most approved Fixing for joining Corrugated Iron Sheeting together.

REGISTERED TRADE MARK
LIMPET

Full particulars and samples from the Managing Agents—
WILLIAM JACKS & CO., 5, East India Avenue. LONDON, E.C.
Agents for Scotland : Frank G. Price & Co. 53, Waterloo St., Glasgow.

(Tenders continue d from page vi.)

Frodsham.—Accepted for the partial completion of new house, Frodsham, for Herman Arledter, Esq. Samuel Davies, M.S.A., architect, Frodsham :—

Robert Gleave and Son, Frodsham, £1,490; heating, Lea and Son, Runcorn, £80.

London, N.—For construction of new road and sewers upon the Markfield Estate, South Tottenham, N. Messrs. David Burnett, Son, and Baddeley, surveyors, 15, Nicholas Lane, London, E.C. :—

C. W. Killingback and Co.	£2,500	0	0
J. A. Dunmore	2,413	17	0
W. Neave and Son	2,350	0	0
E. Parry and Co.	2,298	0	0
E. Peill and Sons	2,255	0	0
Rowley Bros.	2,214	0	0
R. Ballard	2,095	0	0
S. Kavanagh	1,987	0	0
W. and C. French	1,975	0	0
T. Adams	1,963	0	0
F. Hamlett,* Cotswold Works, Plaistow	1,898	0	0

*Accepted.

London, Wandsworth, S.W.—For the erection of a new public elementary school at Hitherfield Road, for the London County Council :—

Holliday and Greenwood, Ltd., Brixton	£11,520	0	0
W. Harris, North Woolwich	11,364	0	0
E. Triggs, 92, The Chase, Clapham	11,340	0	0
W. King and Son, 3, Vauxhall Bridge Road	11,143	0	0
J. Garrett and Son, 83, Balham Hill	11,099	0	0
G. Munday and Sons, Muscovy House, Trinity Square	10,987	0	0
W. Smith and Son, Harleyford Road	10,910	0	0
J. Smith and Sons, Ltd., Junction Works, South Norwood	10,718	0	0
J. and C. Bowyer, Ltd., Upper Norwood	10,687	0	0
W. Akers and Co., Ltd., 13, High Street, South Norwood	10,634	0	0
G. Godson and Sons, Pembroke Works, Kilburn Lane	10,528	0	0
W. Johnson and Co., Ltd., Wandsworth Common	10,476	0	0
J. Marsland and Sons, York Street, Walworth	10,468	0	0
J. Carmichael, 331, Trinity Road, Wandsworth	10,436	0	0
W. Downs, Hampton Street, Walworth	10,392	0	0
Galbraith Bros., Ltd., 46, Camberwell Green	10,117	6	9

Estimate of the architect (Education) to the Council, £10,614.

*Recommended by the Education Committee for acceptance, subject to the approval of the finished plans by the Board of Education.

Mansfield.—For erection of three houses, Blind Lane, Mansfield. Mr. Arthur E. King, M.S.A., architect and surveyor, Bishop's Chambers, Mansfield :—

C. G. Percival, Mansfield	£1,100	0	0
Tweltridge and Co., Mansfield	1,080	0	0
G. Frisky, Mansfield	1,052	0	0
A. J. Copestake, Mansfield	1,026	9	0
Witham and Sons, Mansfield	977	3	8
A. E. Bristowe, Mansfield	973	0	0
Vallance and Blythe,* Mansfield	945	0	0

*Accepted.

Newcastle-under-Lyme.—For the erection of new Sunday schools, etc., for the trustees of the Brunswick Wesleyan Church, Newcastle-under-Lyme. Messrs. Garside and Pennington, architects, Ropergate, Pontefract, and Central Chambers, Castleford :—

J. Cooke, Forthall	£2,300
T. Shufflebotham, Newcastle-under-Lyme	2,290
W. Thomas, Hanley	2,230
T. Gallimore, Newcastle-under-Lyme	2,198
J. Jones, Silverdale	2,021
S. Heath,* Besford, Stoke-on-Trent	1,987

*Accepted.

Palmer's Green.—For the erection of Palmer's Green Congregational School Church. Messrs. G. Baines and Son, architects, 5, Clement's Inn, Strand, London, W.C. :—

Messrs. Patman and Fotheringham	£1,891
F. G. Minter	1,853
Knight and Son	1,789
Brightman and Son	1,789
W. Lawrence and Son	1,775
A. Monk	1,760
F. P. Duthoit	1,690
Battleys, Sons and Holness	1,679
Dove Bros.	1,665
J. W. Jenam	1,636
Mattock Bros.*	1,593

Sheepridge (Huddersfield).—For erection of new Wesleyan Sunday School and alterations to the present chapel, Sheepridge, near Huddersfield. Messrs. Garside and Pennington, architects, Pontefract and Castleford. Quantities by architects. Accepted tenders :—

T. Bottomley and Sons, brick and stone work, £2,195; J. and J. Wilkinson, Marsden, joiners, £780; Milnes and Garside, plumbers, £340; Theabould and Sons, Bradford, plasterers, £31 10s.; T. B. Tunnacliffe, slater, £164; G. Moxon and Son, painters, £44 10s. Rest of Huddersfield.

Sheerness.—For erection of Sheerness Higher Elementary School, for the Kent Education Committee. Mr. Wilfred H. Robinson, M.S.A., architect :—

Stephens, Bastow and Co.	£7,345	0	0
W. J. Ballard and Co.	7,300	0	0
J. Parren and Sons	7,297	10	0
T. Crossley and Son	7,140	0	0
T. W. Moss	7,000	0	0
G. Gates and Sons	6,989	0	0
W. Wallis, Ltd.	6,919	0	0
G. Browning	6,797	0	0
J. Podger and Sons,	6,714	0	0
L. Seager	6,696	0	0
West Bros.	6,685	0	0
T. Knight	6,670	0	0
Amos and Foad	6,595	0	0
G. E. Wallis and Sons	6,484	0	0
G. Baker and Sons	6,399	0	0
C. E. Skinner,* Railway Street, Chatham	6,393	0	0

*Recommended for acceptance.

Trimdon, Durham.—For an extension to the Trimdon branch premises of the Station Town Cooperative Society. Mr. J. Wilson Hays, architect, Wingate :—

Watson and Co.	£1,112	3	7
Draper and Sons	1,100	0	0
J. A. Tweddle	1,025	0	0
Oliver	982	17	0
Coates	951	0	0
Makepeace and Valks	929	12	2
E. M. Tweddle	925	0	0
Hutton	847	0	0
Thompson,* Wingate	784	10	0

*Accepted.

Wymondham.—For the erection of a Baptist Church. Mr. A. F. Scott, architect and surveyor, 24, Castle Meadow, Norwich :—

Spalding, Sons, and Co., Ltd.	£1,554	0	0
H. P. Bowden	1,465	0	0
G. Jeffries	1,435	0	0
J. Youngs and Son	1,389	0	0
J. S. Smith	1,387	0	0
Scarles Bros.	1,386	0	0
Spencer, Santo and Co.	1,315	0	0
E. J. Smith	1,300	0	0
B. Blazey,* Wymondham	1,265	15	0

*Accepted.

Wallingford.—For erection of five houses, Wantage Road. Mr. Edwin G. Hearness, architect and surveyor, Wallingford :—

J. Bartlett	£1,250	0	0
J. Kirby	1,249	0	0
Bosher and Sons	1,235	5	0
H. Bowden	1,205	0	0
S. Robbins*	1,100	0	0

*Accepted.

Wickford, Essex.—Accepted for the erection of a detached cottage, on Garden Village Estate, for W. J. Skinner. Mr. J. Wornell, architect, "Trevose," King Edward Street, Slough.

F. W. Burtwell, Brentwood, £210.

'Phone Holborn 1562.

The Brilliant Sign Co. 1907 Ltd.

Original Manufacturers of Brilliant Sunk Gilt Copper Window Letters.

THE LARGEST MANUFACTURERS IN THE WORLD OF

PLATE GLASS FACIAS
STALLPLATES
SWING SIGNS
GILT WOOD LETTERS
ILLUMINATED SIGNS
(of every known style)
REPOUSSÉ COPPER WORK
WINDOW LETTERS

Guaranteed Best Work—Keenest Rates in the Trade.

60 pp. Illustrated Art Catalogue Free.

Wire: "Signboards, London."

38 Grays Inn Rd. London W.C.

BRILLIANT SUNK GILT COPPER PLATE GLASS FACIAS, &c.

TELEPHONE No 9492 Central
PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART
MEASURES BROS LTD. 53B SOUTHWARK ST. LONDON, S.E. & PITLAKE, CROYDON.
TELEPHONE No 171 CROYDON.
10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.
SECTION SHEETS, BOOKS & PRICES ON APPLICATION.
CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.

STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

April 22. HOPEMAN.—Mason, carpenter, plumber, slater, plaster, and painter works, of a cottage to be erected at Hopeman. Plans, etc., may be seen with John Wittet, architect, Elgin. Tenders to be sent in by April 22.

April 22. DARTMOUTH.—Erection of a pair of semi-detached villas at Townstal, Dartmouth, for Dr. Richard B. Searle. Plans and specifications, and copy of bills of quantities, on deposit of £1 1s., at the office of W. Percy Marr, A.R.I.B.A., architect and surveyor, Dartmouth. Tenders to be delivered by April 22.

April 22. LIMAVADY (IRELAND).—Erecting and completing a manse on the Rabbit Brae, Limavady, for the committee of the First Limavady Presbyterian Church. Plans and specification with Rev. William Browne, B.A., Catherine Street, Limavady. Tenders with R. A. Thorpe, Limavady, by noon on April 22. A detailed estimate of work must accompany contractor's tender.

April 22. HONLEY.—Erection of an organ chamber and vestry to the parish church of Honley. Plans and specification on application to Mr. Wright, parish room, Honley, up to April 22, upon which date tenders are to be sent to C. Hodgson Fowler, F.S.A., architect, The College, Durham. Quantities on application to William Morton, quantity surveyor, 45, John Street, Sunderland.

April 22. PAISLEY.—Alterations at buildings 13 and 14, Gilmour Street, for the town council, viz.:—Mason, brick and steel works, joiner work, slater work, plumber work, plaster work, painter work, electric lighting work. Plans and schedules of quantities at the office of the master of works, 13, Gilmour Street. Offers marked "Alterations at Buildings, Gilmour Street," to be lodged with Fra. Martin, town clerk, Municipal Buildings, Paisley, by 10 a.m., April 22.

April 23. TRIMINGHAM.—Erection of a Primitive Methodist Church at Trimingham. Plans and specifications, and copy of quantities, on application to A. F. Scott, architect and surveyor. Tenders by noon on April 23, to Rev. J. A. Snaith, care of A. F. Scott, architect and surveyor, 44, Castle Meadow, Norwich.

April 23. BLACKROCK (CO. DUBLIN).—Erection of houses for the working classes and other work in connection therewith, at Brookfield, Blackrock. Plans, etc., at the town clerk's office, town hall, Blackrock. £1 1s. deposit for a copy of the bill of quantities for each separate block of buildings. Tenders to be sent in by April 23.

April 23. WHITGREAVE (STAFFORD).—Erection of cottages and buildings on small holdings in the parish of Whitgreave, for the C.C. Plans and specifications by appointment at the office of the county estate agent, 3, Martin Street, Stafford. Tenders, marked "Buildings for Small Holdings" by April 23, to Eustace Joy, clerk to the C.C., County Buildings, Stafford.

April 23. BOWBURN BRIDGE (DURHAM).—Reconstructing Bowburn Bridge in brickwork arch, 7ft. span. Plans, specification, and conditions of contract and bills of quantities at the county surveyor's office, Shire Hall, Durham. Tenders, to be delivered to William Crozier, A.M.I.C.E., county surveyor, by noon on April 23. Security required.

April 24. GIRVAN (SCOTLAND).—Erection of new town hall and other works in connection therewith for the corporation. Names and addresses before April 24, to Jennings and Gray architects, Canterbury.

April 24. DOWNPATRICK.—Erection of and fencing 245 single labourers' cottages for the R.D.C. Plans, etc., from the clerk on payment of 2s. Tenders to be sent in by April 24.

April 24. LEADGATE (DURHAM).—Erection and completion of a five-roomed house, with all outbuildings also laying all drains in Watling Road, Leadgate, for W. R. Stockdale. Plans and specification to be seen at Elm Park Cottage Farm, Medomsley, until April 24.

April 24. CYMMER.—Erection of a retaining wall, iron work, and concrete floor at Avondale Hotel, Cymmer. Also alterations and additions to the above hotel. Drawing and specification at the hotel. Tenders by April 24, to the secretary, Rhondda Valley Breweries Company, Limited, Pontypridd.

April 24. AMLWCH (ANGLESEY).—Erection of new schoolroom and rebuilding Wesleyan Chapel, Amlwch. Plans and specification at the offices of W. F. Brindle, architect and surveyor, etc., Mona Street, Amlwch, and High Street, Llangefni, also at Mr. Williams', Myrtle House, Llandudno. Tenders, endorsed "Wesley Chapel Rebuilding, etc.," to the Rev. Lewis Owen, Wesley House, Amlwch, by noon on April 24.

April 24. RISCA (MON.).—Erection of a new school to accommodate 260 infants, at Risca, Mon., and alterations to the existing school buildings, for the Monmouthshire education committee. Plans and specifications and bills of quantities at the office of John Bain, architect, C.C. offices, Newport, on deposit of £3 3s. Tenders to C. Dauncey, secretary, C.C. offices, Newport, Mon., by April 24.

April 24. PRESTON (LANCS).—Erection of an X-ray department, for the Preston and County of Lancaster Queen Victoria Royal Infirmary. Drawings at the office of the architect, F. E. Dixon, A.M.I.C.E., 49, Lune Street, and copies of the bill of quantities on deposit of £2. Tenders, endorsed, "X-Ray Department," by 9 a.m., on April 24, to Walter Davies, secretary, 5, Winckley Street, Preston.

April 24. TRURO.—Alterations and additions to premises 27 and 28 Richmond Hill and Bosvigo Road, Truro, for Doney, Son, Watts, and Co. Plans and specifications at the offices of the architect and also at the office and works of Doney, Son, Watts and Co., Pydar Street, Truro. Tenders by 10 a.m. on April 24, to Noel F. Bellamy, architect and engineer, Bodmin Road, St. Austell, and Princess Chambers, Plymouth.

April 26. DERBY.—Erection of extensions to the Derby borough asylum to accommodate 126 patients, and for new workshops and bakehouse. Bills of quantities on deposit of £1 1s. Plans at the office of B. S. Jacobs, F.R.I.B.A., architect and surveyor, Lincoln's Inn Buildings, Bowlalley Lane, Hull; or Thorpe and Fryer, architects and surveyors, 23, St. James' Street, Derby. Tenders endorsed "Asylum Extensions," to G. Trevelyan Lee, town clerk, 15, Tenant Street, Derby, by 11 a.m. on April 26.

April 26. HILLSBOROUGH, Co. DOWN.—Erection of new shop and dwelling-house at Hillsborough, County Down. Plans and specification with Thomas Houston, architect and civil engineer, Kingscourt, Wellington Place, Belfast, to whom tenders are to be sent by April 26.

April 26. YNYSDDU.—Erection of twenty houses at Ynysddu for the Ynysddu Building Syndicate. Plans, specification, and form of contract, and form of tender, at the office of the architect. Tenders to be addressed to the Trustees, and delivered to the offices of D. J. Thomas, architect, High Street, Blackwood, Mon, by April 26.

April 27. HODNET (SALOP).—Erection of a house for the station master at Hodnet, for the Great Western Railway Co. Plans and specification and forms of tender at the office of the engineer at Wolverhampton Station. Tenders to G. K. Mills, secretary, Paddington Station, London, marked "Tender for House at Hodnet," by April 27.

April 27. EVENWOOD.—Erection of a billiard room at Evenwood, for the Workmen's Club and Institute, Limited. Plans and specifications and full particulars on application to C. Johnston, architect and surveyor, Victoria Street Chambers, Bishop Auckland. Tenders to M. Bowman, secretary, Evenwood, by April 27.

April 27. ABERDEEN.—Mason, slater, plaster, and carpenter work of new dwelling-house, East Haybogs, and of new barn, Braeside, on the Tonley Estate. Plan and specifications with Alexander Dow, ground officer, or with Hunter and Gordon, advocates, 80, Union Street, Aberdeen, with whom tenders should be lodged by April 27.

April 27. HONEYBOURNE, GLOS.—Additions to station buildings and other works at Honeybourne, for the Great Western Railway. Plans and specification, and forms of tender and bills of quantities, at the office of the resident engineer at Birmingham Station. Tenders, marked "Tender for works at Honeybourne," by April 27, to G. K. Mills, secretary, Paddington Station, London.

April 28. RATHFRILAND, IRELAND.—Erection of a new bank house at the Rathfriland branch, for the directors of the Belfast Banking Co. Plans and specification at the office of the architects, and copies of the bill of quantities from Mr. Hunter, Scottish Provident Buildings, Belfast. Tenders by April 28, endorsed "Tender for Bank House, Rathfriland," to Graeme-Watt and Tulloch, architects, 77a, Victoria Street, Belfast.

April 28. AMBLE.—Additions and alterations to the Central Hall, Amble, for T. Gibson. Plans, specifications, and general conditions of contract at Mr. Gibson's house adjoining the hall. Tenders by April 28, to S. Pedelty, Broomhill Colliery, Acklington.

April 28. NEWTON ABBOT.—Erection of a Sunday school and offices at Keyberry Park, for the trustees of the Newton Abbot Wesleyan Church. Plans and specifications at the vestry of the Wesleyan church, Courtenay Street. Tenders are to be delivered to J. W. Rowell, Sons and Locke, architects, 2, St. Paul's Road, Newton Abbot, by noon on April 28.

April 28. RHONDDA (WALES).—Erection and completion of new vestry and classrooms, together with other works on chapel, for the Saron Welsh Congregational Church building committee, Williamstown, Rhondda. Plans, specification, and form of tender of W. D. Thomas, architect and surveyor, Tydvil House, Porth, Glam. Tenders, endorsed "Tender for Saron Chapel," to B. Evans, 9, Cornwall Road, Williamstown, Rhondda, Wales, by April 28.

April 29. BRIDGEND.—Erection of three houses at Coychurch, Bridgend, for Isaac Thomas. Plans and specifications at Kingston, Coity Road, Bridgend, where tenders are to be sent by April 29, addressed to W. Y. Davies, architect.,

April 29. LONDON, W.—External repairs at the workhouse, Marloes Road, Kensington, for the board of guardians. Specification and form of tender at the office of W. R. Stephens, clerk, Marloes Road, Kensington, W. Tenders to be delivered at the clerk's office by 3 p.m. on April 29.

April 29. NEW DELAVAL.—Erection of new premises for Walter Willson, Ltd., at New Delaval. Copies of testimonials on the deposit of £1 1s. of the architects. Tenders, endorsed "Messrs. Walter Willson, Ltd.," to be delivered to Joseph Potts and Son, architects and surveyors, 57, John Street, Sunderland, by April 29.

April 29. FIRVALE.—Extension of the male sanatorium at the union hospital, Firvale, for the guardians of Sheffield Union. Plan and specification and full particulars of G. D. Baxter, clerk of works, Firvale workhouse. Tenders, superscribed "Extension of Male Sanatorium," to Albert Edwd. Booker, clerk to the guardians, union offices, Westbar, Sheffield, by noon on April 29. Fair wages clause.

April 30. PORT ELLEN, ISLAY.—Erection of a Baptist Church, Port Ellen, Islay. Specifications with James Quenton, Charlotte Street, Port Ellen. Offers with W. J. Lippiatt, Port Ellen, Islay, by April 30.

April 30. DEVIZES.—Erection of an engineer's house at the county asylum, Devizes, for the Visiting Committee. Plans and specification by the county surveyor. Form of tenders and other particulars on written application, accompanied by £1 1s. deposit. Tenders by April 30, to J. George Powell, county surveyor, county offices, Trowbridge.

May 1. BAKEWELL.—Erection of the men's institute, Bakewell. Plans and specification may be seen, and bills of quantities obtained, on deposit of 5s. with E. M. Longsdon, F.S.I., architect, Bakewell, to whom tenders are to be sent by 10 a.m. on April 27.

May 1. KINGSWEAR (DEVON).—Repairs to farm house at Hoodon Farm, Kingswear, with erecting new roof about 70ft. long thereon. Specification may be seen at the office of T. O. Veale, surveyor, Castle View, Dartmouth, to whom sealed tenders should be delivered by noon on May 1.

May 1. LONDON.—Erection of a permanent school, to accommodate 1,420 children, on the Crowland Road Site, for the Tottenham Education Committee. Applications for quantities to be made to the architect, G. E. T. Laurence, A.R.I.B.A., 22, Buckingham Street, Adelphi, W.C., by May 1, after which date plans and specification may be seen at his office. £2 2s. deposit for the quantities, also £10, Bank of England notes or cash when submitting tenders to W. Mallinson, clerk to the committee, education offices, Philip Lane, South Tottenham, N. Fair wages clause.

May 3. BRISTOL.—Repairs to the main roof of the Bristol Joint Station, for the Great Western and Midland Railways Joint Committee. Plans and specifications, and forms of tender and bills of quantities, at the office of the engineer at Paddington Station. Tenders, marked "Tender for Repairs to Bristol Station Roof," by May 3, to Wm. Clower, secretary, Derby.

May 6. BUILTH WELLS.—Laying out and building a new cattle market place, drainage, water supply, sheep, cattle, and pig pens, town yard, stable, etc., etc., new street, and sewerage, etc., etc., for the U.D.C. Plans and specifications, and bills of quantities, on deposit of £2 2s. at the surveyor's office. Tenders by May 6, to Telfer Smith, M.S.A., architect and surveyor, Market Buildings, Builth Wells.

No date. SOUTHAMPTON.—Erection of a house in Southampton for Whiteswood Estates, Limited. Plans at the offices of R. M. Lucas, F.R.I.B.A., Bargate Chambers, Southampton. Copies of quantities on deposition of 10s.

No date. BRADFORD.—Erection of detached residence, Nab Wood Estate. Names to H. W. Rogerson and Co., architects and surveyors, 40, Sunbridge Road, Bradford.

ENGINEERING.

April 27. LEEDS.—Construction and erection of the steelwork for a bridge 75ft. wide by 42ft. span over Bridge Street, Leeds. Drawings, specification, and conditions of contract and bills of quantities on deposit of £3 3s., of W. T. Lancashire, city engineer, municipal buildings, Leeds. Tenders at the town clerk's office by 10 a.m. on April 27.

April 27. LONDON.—Reconstruction of a portion of the high level coal viaduct at Paddington goods station, for the Great Western Railway. Plans and specification, and forms of tender and bills of quantities, at the office of the engineer at this station. Tenders, marked "Tender for Coal Viaduct, Paddington," by April 27, to G. K. Mills, Secretary, Paddington Station, London.

April 27. LEEDS.—Construction of jack arches, concreting, and paving work, to a steel girder bridge, over Bridge Street, Leeds, for the Corporation. Drawings, specification, and conditions of contract at the office of Mr. W. T. Lancashire, city engineer, Municipal buildings, Leeds. Bills of quantities on deposit of £3 3s. Tenders, at the town clerk's office by 10 a.m. on April 27.

April 30. DURHAM.—Construction of reservoir, pipe line, and other works on the Hardwick Estate at Blackhall Colliery in accordance with plans and specification, to be seen on application to James Hamilton, Horden Colliery office, Castle Eden, Durham. Tenders to J. J. Prest, Castle Eden, by April 30.

April 30. STOKE ST. GREGORY.—Supplying:— 1, about 16 miles of cast-iron piping; 2, sluice valves, hydrants, etc.; 3, laying and fixing the above pipes and fittings; 4, construction of a 50,000 gallon brick reservoir, for the Taunton R.D.C. Specifications and forms of tender of the engineers, Merryweather and Sons, Greenwich Road, London, S.E., on deposit of £2 2s. (cheque). Tenders, by April 30, to W. F. B. Dawe, clerk to the council, union offices, Taunton, at whose office plans may also be inspected.

May 3. BATH.—Taking down and rebuilding the undermentioned two small bridges, for the Somersetshire C.C.: Bottle Bridge, Hatch Beauchamp, new reinforced concrete arch, 23ft. span, and abutments, masonry walls, etc.; Donyatt Bridge, near Ilminster new masonry abutments, walls, etc., and reinforced concrete beams and floor, 12ft. span. Drawings, specifications and form of contract may be seen by appointment at the county surveyor's office, Bath, on and after April 19, and bill of quantities and forms of tender at the county surveyor's office, upon deposit of £2 2s. Tenders, endorsed "Bottle Bridge" or "Dodenyatt Bridge," by May 3, to H. T. Chapman, county surveyor, 1, Chapel Row, Bath.

PAINTING.

April 22. BLACKBURN.—Painting at the Corporation and Queen's Parks, for the corporation. Specification and form of tender of the engineer. Tenders by 9 a.m. on April 22, to William Stubbs, A.M.I.C.E., borough engineer, municipal offices, Blackburn.

April 26. HITCHIN.—Painting the outside and inside wood and ironwork of the Corn Exchange, Hitchin, for the Hitchin Market Co., Ltd. Specification of J. Shilcock, Hitchin, to whom tenders are to be sent by 1 p.m. on April 26.

May 1. YORK.—Painting and limewhiting, at certain schools during the summer holidays, for the York education committee. Specifications from J. H. Mason, secretary, education offices, Clifford Street, York. Separate tenders for each school to be painted, and one tender for the whole of the limewhiting. Tenders must be sent in, endorsed, "Tender for Painting," by May 1, to the secretary.

May 3. CHARING (KENT).—Painting the parish hall and notice boards, for the council. Full particulars of George V. Ellen, clerk, Wickens, Charing, to whom tenders, endorsed "Painting," are to be delivered by noon on May 3.

No date. BINGLEY.—Painting and decorating the Wesleyan Church, Mornington Road, Bingley. Work to commence on July 12 and completed before the end of August. Quantities and other particulars may be obtained from Wm. Rhodes Nunns, M.S.A., Bingley.

PLUMBING & SANITARY

April 22. DEVONPORT.—Providing and constructing a new drainage system and other sanitary work at the workhouse, Ford, Devonport. Plans and specifications at the office of the architect, Charles Cheverton, M.S.A., 64a, Chapel Street, Devonport. Bills of quantities will be supplied by the architect on deposit of £1 1s.. Tenders, endorsed "New Drainage Scheme," by 5 p.m. on April 22, to Albert Gard, clerk, 19, St. Aubyn Street, Devonport.

April 22. PATELEY BRIDGE (YORKSHIRE).—Providing and laying about 630 lineal yards 9in. and 6in. earthenware pipe sewers, together with the necessary manholes, etc.; also the construction of sewage disposal works, consisting of detritus tank, storm water tank, open septic tank, percolating filter, and all contingent works, for the R.D.C. Plans and specifications of the engineer, A. W. Pilling, A.M.I.C.E., 20, Park Row, Leeds, from whom bills of quantities and forms of tender may be obtained on deposit of £1 1s. Tenders, endorsed "Lofthouse Sewerage," by 10 a.m., on April 22 to W. Oddie, clerk to the council, Pateley Bridge, Yorkshire.

April 22—30. RENFREW.—Construction of sewage purification works at Giffnock and the laying of about 810 yords of main sewer, comprised of 24, 21, and 18 inch diameter fireclay pipes, and contingent works, for the C.C. Plans at the office of J. Gilchrist Bennett, C.E., 12, High Street, Paisley, from whom copies of the specification, schedule, and form of tender may be obtained on deposit of £1. An assistant engineer will meet contractors at Giffnock Station, 10 a.m. train from Glasgow Central Station, on April 22. Tenders, marked "Tender for Giffnock Sewer and Sewage Purification Works," by 10 a.m. on April 30, to William H. Hill, district clerk, 194, Ingram Street, Glasgow.

April 24. NEW TREDEGAR (MON).—Providing and erecting a four-stall public urinal (Duckett's or other approved pattern), including the necessary masonry, etc., complete, at New Tredegar, Mon., for the U.D.C. of Bedwellty. Plans and specification on application in writing, to the council's surveyor, J. H. Lewis, Assoc.M.Inst. C.E., Blackwood, Mon. Tenders, endorsed "Tender for Urinal," by April 24, at 2 p.m., to T. J. Thomas, clerk to the council, Bargoed, Glam.

April 27. LONDON.—Alterations and sanitary work in connection with new bathrooms, etc., at the district sick asylum, Devons Road, Bromley, E., for the managers of the Poplar and Stepney sick asylum district. Plans and specifications of the architects, J. and W. Clarkson, 136, High Street, Poplar, E. Drawings and conditions of contract at the offices of the architects, and a copy of specification and form of tender upon deposit of £3 3s. Tenders, endorsed "Tender for New Bathrooms, etc.," by 10 a.m., on April 27, to Fred. J. Morrison, acting clerk to the managers, Devons Road, Bromley-by-Bow, London, E. Fair wages clause. Sureties required.

April 30. BRANDON.—Laying sanitary pipes and the construction of manhole, etc., in connection with proposed new sewer at Brandon Colliery. Plans and quantities of Geo. G. Donkin, surveyor, Langley Moor. Tenders marked "Sewer," to J. G. Wilson, 5, North Bailey, Durham.

May 3. STOCKPORT.—Manual and team labour and materials in laying (about) 3,300 lineal yards of stoneware pipe sewers, ranging from 6in. to 21in. in diameter, together with the necessary manholes and lampholes, in Broadstone Road and Broadstone Hall Road, for the corporation. Plans, sections, etc., and conditions of contract, specification, and form of tender of John Atkinson, A.M.I.C.E., borough surveyor, town hall, Stockport, to whom tenders endorsed "Tender for Sewers in Broadstone Road, etc.," are to be sent before noon on May 3. Fair wages clause.

May 4. BUSHEY, HERTS.—Provision and construction of detritus tank, dosing chamber, percolation beds and sprinklers, sand filters, alterations to septic tanks, and all carriers, pipes, and incidental works appertaining thereto, for the U.D.C. Plans, drawings, specification, and conditions of contract, on application to the engineer and surveyor, Ernest E. Ryder, council offices, Bushey. Specification, bill of quantities, and form of tender, on deposit of £3 3s. Tenders by noon on May 4, to John Wilson, clerk to the council, council offices, Bushey, Herts.

ROADS AND CARTAGE.

April 23. RHONDDA.—Paving, kerbing, channelling, roadmaking, etc., the following streets under the Private Street Works Act, 1892:—1, Bank Street, Penygraig; 2, Bellevue Street, Penygraig; 3, Greenfield Street, Penygraig; 4, Hendre Terrace, Penygraig; 5, Brewery Terrace, Pontygwaith, for the U.D.C. Plans and form of tender at the office of the engineer and surveyor, public offices, Pentre, Rhondda, on deposit of £1 1s. Tenders to the chairman of the council, public Offices, Pentre, Rhondda, by 10 a.m. on April 23. Fair wages clause.

April 23-26. SOUTH MOOR.—Forming and completing several private streets at South Moor, for the Stanley U.D.C. Plans, sections, and specification, and quantities and forms of tender, from J. P. Routledge, surveyor, council offices, Stanley, on April 23, between 10 a.m. and 4 p.m. Tenders, endorsed "Street Works," by April 26, to John Geo. Ridley, clerk to the council. Security required.

April 24. THIRSK.—Supply of about 2,000 tons of Whinstone and 6,000 tons of slag, to be delivered, carriage paid, as directed for the R.D.C. Form of tender from R. R. Wright, highway surveyor, Thirsk, on receipt of stamped addressed foolscap envelope. Duplicate samples of stone to be sent to the surveyor of highways, Thirsk, by April 23. Tenders by noon on April 24, to William Swarbreck, clerk to the council, union offices, Finkle Street, Thirsk.

April 26. LONDON.—Making-up and paving Earldon Road, Putney, for the Wandsworth corporation. Specification and drawings and forms of tender at the borough engineer's office, new streets department, 56, East Hill, Wandsworth, S.W., by 4 p.m. on April 26. Fair wages clause. Sureties required.

April 26. BURGESS HILL.—Supplying 900 tons broken granite between 1½in. and 2in gauge, 10 tons under 1in. gauge, and 75 tons fine granite for binding, for the U.D.C. Tenders on forms to be obtained from A. F. Hardwick, clerk, Burgess Hill, Sussex, endorsed "Tender for Granite," with samples, to be delivered to the surveyor of the Council by April 26.

April 26. PRESTWICH (NEAR MANCHESTER).—Supplying between 200 and 300 tons of granite setts 5in. by 4in., or 6in. by 3½in., for the U.D.C. Prices must include delivery, carriage paid, at Prestwich station. Tenders, endorsed "Tenders for Granite Setts," accompanied by sample, by noon on April 26 to Lewis A. Orford, law clerk to the council, council offices, Prestwich, near Manchester.

April 26. MONKSEATON.—Making up and completing carriageways and footways at "The Fold," Monkseaton, for the U.D.C. Plans and specification, and bill of quantities and form of tender on application at the office of A. J. Rousell, A.M.Inst.C.E., council's surveyor, council offices, Whitley Bay. Tenders, endorsed "The Fold," to be delivered by noon on April 26, to Augustus Whitehorn, clerk to the council, 60, Saville Street, North Shields.

April 27. BROMLEY (KENT).—Sewering, levelling, paving, metalling, channelling, and making good Shortlands Gardens and a portion of Southlands Road for the corporation. Plans, sections, specifications, and bills of quantities, etc., at the office of the borough engineer on deposit of 10s. Tenders, endorsed "Tender for Works of Street Improvement," must be delivered by 3 p.m. on April 27, to Fred H. Norman, town clerk, municipal offices, Bromley, Kent.

May 1. PRESTWICH (NEAR MANCHESTER).—Carrying out works of private street improvement in seven streets for the U.D.C. And also supplying and laying of 91 lineal yards of 24in. diameter earthenware pipe sewer in Bury New Road. General conditions of contract at the surveyor's office, Chester Bank, Prestwich. Plans, specifications, and quantities of the surveyor, Chester Bank. Bills of quantities and any information of the surveyor on deposit of £2 2s. Tenders, endorsed "Tenders for Private Street Works and Sewer, Bury New Road," by 10 a.m. on May 1, to Lewis A. Orford, law clerk to the council, county offices, Chester Bank, Prestwich, near Manchester.

May 10. GUILDFORD. — Supplying granite, Bargate stone and flints, also carting materials on various roads in the district, and for team labour during the year ending March 31, 1910, for the R.D.C. Forms of tender, and other information from the surveyor of the council, J. Anstee, C.E., council's offices, Commercial Road, Guildford. Tenders by May 10, to W. S. V. Cullerne, clerk to the council, offices, Commercial Road, Guildford.

May 10. RAWTENSTALL.—Manual and team labour and materials in paving and sewering, etc., Grange Road, Alder Bank, Prospect Road, Beech Street, Back Beech Street, Greenfield Street, Whittle Street, Back Whittle Street, street along end of No. 7, Whittle Street, and Clarence Street, all for the corporation. Plans and sections and forms of tender, general conditions, specification, and quantities of James Johnson, C.E., borough surveyor, municipal offices, Rawtenstall, on deposit of £2 2s. Tenders, endorsed "Tender for Private Street Works," to be delivered by noon on May 10, to James Whalley, town clerk, municipal offices, Rawtenstall.

MISCELLANEOUS.

April 24. ROSEDALE.—Re-seating Rosedale Church with pitch-pine. Tenders to be sent to the Vicar by April 24.

April 26. HANLEY (STAFFS.).—Execution of the following:—1, painting at all the markets; 2, new private baths; 3, alterations at town hall; 4, new steps to butchers' market; 5, flag-making plant at destructor. Full particulars, quantities, and forms of tender, at town hall, Hanley. Tenders before 5 p.m. on April 26, to Joseph Lobley, borough engineer and surveyor, town hall, Hanley. Fair wages clause.

April 26—May 10. CHELMSFORD.—Demolition of existing buildings on the site of 83, High Street, and construction of a public convenience on part thereof for the corporation. Specifications, bills of quantities, forms of tender, and full particulars on deposit of £1 1s.. Plan at the borough surveyor's office, 16, London Road, on and after April 26. Tenders, endorsed "Public Convenience," by 4 p.m., on May 10, to W. Smith, town clerk, Municipal Offices, 16, London Road, Chelmsford.

April 27. SWINTON (MANCHESTER).—Asphalting certain paths or walks at the Swinton cemetery for the Burial Board. Copies of specification of W. T. Postlethwaite, clerk to the board, Swinton, Manchester to whom tenders are to be sent before noon on April 27.

THE

Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE architect prepares designs, perspectives, working drawings, etc., on moderate terms.—W., 6, King's Road, Kingston-on-Thames. 4918

ABLE ASSISTANCE rendered, drawings, tracings, photo-prints prepared, plans from rough sketches, specifications, etc.—Yorkshire Drawing Office, 21, Scale Lane, Hull. 4940

ACADEMY (Royal) exhibitor prepares perspectives on moderate terms; specimens sent; also designs, plans from rough sketches, drawings, tracings, competition work, etc.—Box 4983, Builders' Journal Office.

ARCHITECT'S Assistant (24), disengaged; Inter. R.I.B.A.; 6½ years' varied experience; working drawings, details, and perspectives, levelling; assist with quantities; shorthand and typewriting; excellent references. — S. Riches, 35, Culverden Road, Balham, S.W. 4963

ADVERTISER (20), three years with Quantity Surveyors, wishes to enter Builders' Office (preferably estimating department); excellent testimonial; very low commencing salary, with good prospects. —E., 2, St. Mary's Road, London, S.E. 4960

APPOINTMENT as Improver (19), just completed three years' articles with architect; good draughtsman, tracer, etc.; excellent testimonials; moderate salary.—J.S.C., 10, Almena Road, Clapham Common. 4993

ARCHITECT and Surveyor's Assistant (25), 9 years' experience; excellent draughtsman, working drawings, details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECT'S Assistant desires engagement, finalist, R.I.B.A.; design, details, specifications; first-class honours, quantity surveying, honours (Part I.), building construction, artistic and practical; moderate salary.—Address, Architect, 24, Brunswick Street, C.-on-M., Manchester. 4984

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. **4888**

ARCHITECT'S Assistant (27), excellent draughtsman and colourist; contract drawings, specifications, details, design, perspective, surveys, etc.; travelling studentship winner; highest refs.—Box 4902, Builders' Journal Office.

ARCHITECT'S Assistant (26), desires engagement at moderate salary; good draughtsman.—Address, Young, Narellan, Old Colwyn. 4950

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill, S.W. 4992

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

BUILDER'S or Architect's Assistant (25), Inter. R.I.B.A.; neat draughtsman, levelling and surveying; assist quantities, specifications, accounts, and general routine; excellent references; moderate salary for experience. — H. O'R., 80, Lavender Sweep, Clapham Common, S.W. 4973

BUILDERS' and Contractors' Assistant desires situation, knowledge of plans, specifications, quantities, wages and general office routine; age 21; 4½ years' experience; salary moderate; good timekeeper.—Box 4994, Builders' Journal Office.

CARPENTER, and French polisher wants situation; young, capable workman, good refs.; moderate wage.—C.P., 21, Redstone Road, Redhill, Surrey. 4989

CLERK of Works, shortly disengaged, first-class, well up in all trades; abstainer; best London references.—R.E., 3, Oakfield Road, Stroud Green, London, N. 4986

Owing to pressure on our space we have been compelled to hold over a number of these small Announcements and the Employment Register. These will appear next week.

CLERK of Works, disengaged; experienced in building and engineering works; home or abroad; fluent French, translations.—Address, Tett, 78, Durban Road, Beckenham, Kent. 4988

ENGINEER, 29, disengaged; exp. in designs, detail, drawings, calculations, quantities, structural steelwork, fireproofing, reinforced concrete, bridges, buildings.—Box No. 4991, Builders' Journal Office.

Appointments Vacant.

WANTED at once, by an estate and house agent, a general architectural assistant, competent in design, construction, specifications and shorthand; if quantities preferred; to reside with the principal; state full particulars, experience, references and salary.—M., 13, Holmesdale Road, Sevenoaks. 4990

THE GUILD OF ARCHITECTS' ASSISTANTS.

A Guild of the profession formed to promote and maintain the interests of Assistants.

The Committee desire to receive the names of all interested in the proposals of the Guild, and any expressions of opinion thereon. All information required will be given by the Secretary, 60, Idmiston Road, Stratford, E. 4985

ARCHITECTURAL draughtsman wanted, tracings, perspectives; state age and salary required, to Box 4981 Builders' Journal Office.

DRAUGHTSMAN wanted, tracings, etc.; state age and salary required, to Box 4982, Builders' Journal Office.

Miscellaneous.

BUILDERS' Books at tremendous reductions !! Books on every subject and for all examinations, supplied; sent on approval. Catalogues free; state wants. Books purchased.—W. and G. Foyle, 135, Charing Cross Road, W.C.

For **PHOTO PRINTS** on
Tracing Cloth,
Try B. J. HALL AND CO., LTD.,
39, Victoria Street, Westminster.

SECOND-HAND Optical Mart.
For the Purchase and Sale of
LEVELS, THEODOLITES, DRAWING INSTRS.
— Clarkson's, 338, High Holborn, London, W.C. (Opposite Gray's Inn Road).

POLING Boards, selected lengths and thicknesses (best quality and full measure); also scaffold boards, putlogs, scantlings, deals, batten and boards; lowest wharf prices.—C. H. Glover and Co., Ltd., Importers, Hatcham Saw Mills, Old Kent Road, S.E.

Offices to Let.

STORES, large workshops, etc., to let in E. District, with power, ready for immediate occupation; every convenience, near four railway goods termini, and river.—Apply Box 4913, Builders' Journal Office.

Competitions Open.

TO ARCHITECTS PREPARING COMPETITIVE DESIGNS.

SCHEMES FOR ENGINEERING WORK, with approximate Estimates, furnished free of charge by Strode and Co., Lighting, Heating, and Ventilating, Engineers, 48, Osnaburgh Street, London.

FULLY qualified London firm of quantity surveyors are open to make approximate estimates for competitions, prepare bills of quantities, etc., by mutual arrangement; enquiries invited.—Apply Box 4678, Builders' Journal Office.

NORTH RIDING OF YORKSHIRE COUNTY COUNCIL EDUCATION COMMITTEE.

The Education Committee invite competitive designs from architects for a proposed secondary school at Whitby. Application for the conditions (prepared in consultation with the assessor, Mr. Paul Waterhouse) should be addressed before 30th April, 1909, to The Secretary, Education Offices, County Hall, Northallerton. The Committee reserve the right to restrict the number of competitors. 4987

Business for Sale.

BUILDER and Contractor's business (Monmouthshire); established over 40 years; convenient extensive premises; good position; proprietor retiring.—Box 4964, Builders' Journal Office.

Educational Announcements.

SANITARY INSPECTORS' EXAMINATIONS. A CERTIFIED INSPECTOR and ASSOCIATE ROYAL SANITARY INSTITUTE prepares candidates by correspondence. System highly successful. All candidates should possess "The Study of Sanitary Law." (152 pages), 1s. 6d.; 100 Viva Voce Questions, 6d. Prospectus, testimonials.—E. G. Holmes, 7, Queen's Gardens, Ilford. (State paper.) (a

R.I.B.A. EXAMINATIONS.

Special personal system of preparation, by correspondence or private tuition.—Bond and Batley, (A. G. Bond, B.A., A.R.I.B.A., and Claude Batley, A.R.I.B.A.), 115, Gower Street, W.C. Tel. 8705. Central.

R.I.B.A. EXAMINATIONS.

COURSES OF PREPARATION (a) in CLASS; (b) by CORRESPONDENCE; or (c) in OFFICE. — JAMES NEILL, F.S.I., etc., 38, Park Row, Leeds.

SURVEYORS' INSTITUTION EXAMINATIONS. COURSES OF PREPARATION (a) in CLASS, (b) by CORRESPONDENCE, or (c) in OFFICE.—JAMES NEILL, F.S.I., Standard Assurance Buildings, 38, Park Row, Leeds. (Tel. 192.

SOCIETY OF ARCHITECTS' EXAMINATIONS.

COMPLETE PREPARATION by correspondence. —JAMES NEILL, F.S.I., 38, Park Row, Leeds.

ARCHITECT, Inst. Prizeman, prepares students for the R.I.B.A. examinations. For particulars apply Box 4126, Builders' Journal Office.

SURVEYORS' INSTITUTION EXAMINATIONS.

Complete courses of Preparation for these Examinations are given, either in class, or by correspondence, or in office, by

Messrs. PARRY, BLAKE AND PARRY.

At the last examinations, of which the results are known, the chief prizes were awarded to candidates taking these courses, among whom were the winners of the Penfold Gold Medal, the Penfold Silver Medal, the Driver Prize, the Institution Prize, and the Beadel Prize.

For full particulars of these Courses, or for any advice with respect to the Examinations, apply to

Messrs. PARRY, BLAKE AND PARRY,
82, Victoria Street, Westminster. Telephone, Gerrard 5680.

R.I.B.A. SURVEYORS' INSTITUTION AND SOCIETY OF ARCHITECTS

EXAMINATIONS.

Systematic and thorough Individual Preparation by

HOBDAY & VENNING, 19, Hanover Sq., LONDON, W.

Full particulars of Courses and Fees on application.

Telephone: MAYFAIR 2549.

ARCHITECTURAL tuition by Correspondence, or under articles; twenty-five years' successful experience.—G. A. T. Middleton, 19, Craven Street, Strand, W.C.

ARCHITECTURAL EXAMINATIONS.

Preparation personally or by correspondence for R.I.B.A., S.A., and Board of Education, ("Architecture," and "Building Construction") Examinations. Write for free booklet. — H. Hodgson, A.R.I.B.A., Claremont, Morley Street, Bradford.

STRUCTURAL STEELWORK

Can you Design your own Steelwork? Do you know how to properly proportion your columns, stanchions, and girders? We guarantee to teach you how to do this in a few lessons by our System of Correspondence Tuition in Architectural Steelwork.—Apply to us for free Booklet J (4th edition), Midland Engineering Bureau, Strand, Derby.

PRACTICAL DESIGNING of STEEL CONSTRUCTIONAL WORK taught by Correspondence, individually or in classes. Elementary and advanced courses arranged for Architects, Engineers, etc. Write for Prospectus B., Embankment Engineering Institute, 64, Victoria Street, Westminster. S.W.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

Examinations will be held on the following dates:—The Preliminary Examination on the 14th and 15th June, 1909. Applications must be sent in on or before the 1st May.

The Intermediate Examination on the 14th, 15th, 17th and 18th June, 1909. Applicotions must be sent in on or before the 1st May.

The Final and Special Examinations on the 24th, 25th, 26th, 28th, 29th June, 1st and 2nd July, 1909. Applications must be sent in on or before the 22nd May.

The Testimonies of Study, etc., with the necessary fees, must accompany the applications, all of which are to be addressed to the undersigned.

IAN MACALISTER,
Secretary, R.I.B.A.

9, Conduit Street,
London, W.

4979

April 28, 1909. Volume 29. No. 742.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: The Garden of London; Our Homes, 401; The Return of the Native - - - 402
Willoughby v. Technical Journals (1902), Ltd. 402
The Architectural Work of the London County Council. By W. E. Riley, F.R.I.B.A. - - 403
External Leadwork. By F. W. Troup, F.R.I.B.A. 406
Royal Southern Hospital (Liverpool) Extension Competition - - - - - - - - 407
Notes on Competitions - - - - - - 409
The Royal Automobile Club - - - - 409
An Exhibition of Cottage Designs - - - 409
Trade Boards Bill - - - - - - - - 409
Trade and Craft: Some Serviceable Pumps; Hawksley's Staircasing Specialities; A Space-saving System of Library Construction - - - - - - - - - 410

CONCRETE AND STEEL SECTION.

Concrete at Olympia - - - - - - 411
Reinforced Concrete Systems: The Considère System - - - - - - - - - 412
The Dangers of Breeze Concrete. By D. B. Butler, Assoc.M.Inst.C.E. - - - - 412
The Building Trades Exhibition, Second Notice 418—424
Federation Notes - - - - - - - 425
Complete List of Contracts Open, xxxi., xxxii., xxxiii.
Tenders - - - - - - - - vi. and viii.

ILLUSTRATIONS.

Palace of Social Economy and of the Congresses at the Paris Exhibition of 1900. By Charles F. Mewès, Architect - - 403
Kensington Fire Station Plans: W. E. Riley, Superintending Architect, London County Council - - - - - - - 404, 405
Proposed House at Frensham. Arthur J. Stedman, Architect, 406. (See also Centre Plate.)
Royal Southern Hospital (Liverpool) Extension Competition: Haigh and Thompson, 407; Briggs and Wolstenholme and Thornley; Willink and Thicknesse - - - - - 408
Library Construction and Shelving - - - 410
Considère Piles - - - - - - - - 412
Considère System Railway Bridge at Avranches, 413; Viaduct at Tottenham, - 414
Building Trades Exhibition; Prince and Princess of Wales at the Exhibition, 418; Mr. Lewis Harcourt at the Exhibition, 419; The Siegwart Floor, 420; Range of Lavatories (B. Finch and Co.), 421; Visit of the German Delegates - - - - - - 423
Durabar Draught-Excluder - - - - - - 424
House at New Southgate: Plans. Castle and Warren, Architects, 424. (See also Centre Plate.)

The Garden of London. Professor Geddes has been lecturing to the townsfolk of Richmond, Surrey, or those of them who are included in the Richmond Town Advancement Association, on the beauties of their own surroundings. "I have come to the conclusion," he said, "that Richmond possesses natural advantages unrivalled in England, in Europe, or indeed in the whole world." Richmond has felt recently the importance of moving with the times; it has many houses unlet, and its tradesmen suffer in consequence. Hence the formation of the Advancement Association and Professor Geddes' enthusiasm at its first meeting. An intimate acquaintance with Richmond and its surroundings enables us to corroborate Professor Geddes' spirited encomium. The river, the Earl of Dysart's Ham estates, the Royal parks and Sheen Common form a continuous chain of open surroundings that preserve Richmond from the contaminating influences of town. Only on one portion of the circle, extending from Sheen Road to Kew Road, is the approach clear for the ever extending brick and mortar tentacles of London. But on that one side much has been and is being built, which it would be very difficult to eulogise, and such "improvements" as have been effected of late years are not likely to commend themselves as having increased the beauties of the town. Richmond suffers from a plethora of houses that nobody wants, extortionate rents, a very expensive train service, and a great absence of small modern dwellings. The majority of houses on the hill are three or four storied basement residences. Rents in the district can hardly be called moderate. Some small houses are to be had at £40 a year; some of those that go some £10 lower have practically no gardens. A number of new houses are being built in the better roads in Richmond; but the rents and leasehold figures quoted are generally rather high. The rates of Richmond are over 7s. in the pound, and the assessments are heavy; consequently, on a rough calculation a third of the rental must be added for rates. The type of house particularly wanted in Richmond now is one having four bedrooms, a garden (which really should be something more than a back yard), letting at a rental of from £30 to £40 a year. Some houses of this type have been erected recently just off the lower side of Sheen Road; but people who come to Richmond are not very keen on streets on the lower side of that thoroughfare. The railway facilities of Richmond are fairly good, four different companies serving the town, but as the South-Western Railway controls all the lines and prevents all competition, the fares to town are maintained at 9d. single and 1s. 3d. return for a journey of nine miles. There is a small horse tramway from Kew Bridge to the town, owned by the London United Company, who have, as yet, not been able to arrange terms with the Richmond Corporation for its electrification. Bearing in mind how prejudicially the advent of the trams has affected the amenities of riverside places like Teddington, Twickenham, and Hampton on the Middlesex shore, the inhabitants of Richmond have good reason for excluding the trams permanently. Moreover, the time occupied in journeying by train to Shepherd's Bush or Hammersmith to connect with the tube railways would be too long to make them an important factor in Richmond's travelling facilities. The extension of the Piccadilly and Brompton tube from Hammersmith, through Chiswick and Mortlake (two rapidly developing districts), would be a very valuable railway development for Richmond, as it would place it in direct communication with the West End and north-east of London. Professor Geddes' recommendations for improving Richmond may or may not be good. It entirely depends upon the aims of the Advancement Association. If they seek to obtain an increase of steady ratepaying residents, the provision of a Kursaal, which will attract crowds of nonresidents and develop a perhaps undesirable element, is hardly likely to effect their object. If, on the other hand, they look for support to the fleeting crowd who go down to the river and patronise the teashops, the provision of a Kursaal may have the desired effect. But a wet summer may then spell ruin to the tradesfolk, and in any case the daily incursion of crowds of people will have the effect of driving the present inhabitants away. The most pressing factors in Richmond's distress are the very high rents and the unsuitable houses, and until the Advancement Association sees some way of getting over these difficulties we fear Richmond will hardly advance very much. In any case residents can only be encouraged by jealously preserving the rural appearance of the town. A block of red brick flats at the Park gates is not an encouraging symptom of Richmond's development. The aspirations and achievements of Richmond in the matter of town planning are, it seems to us, of much more than merely local importance at the present juncture. They afford a convenient opportunity for studying the general question by means of a particular example. Unhappily it affords us yet another instance of the lack of cohesion and co-ordination whereby so many naturally beautiful districts have been despoiled of their native charm. The Richmond Town Advancement Association is doubtless animated by the best intentions, but we greatly doubt its potency for amelioration on the æsthetic side.

Our Homes. Closely allied with the subject of town-planning is the question of housing. Mr. Burns's Bill, indeed, covers them both; and it was inevitable that discussion upon it should be raised by all those who were interested in what is dubbed "The Housing Question," or by those who think that their material interests are likely to suffer under the proposed new legislation. Nottingham has had a housing question controversy; Birmingham is enjoying one; Leeds is convulsed, apparently, by the projected abolition of the back-to-back house; while the criticisms of a correspondent in the "Glasgow News" on the subject of the Scotch tenement dwelling have roused all the worst passions of the Northern Celt. These little ebullitions in the whirlpool of a great reform may be studied for what they are worth; they will hardly affect the main lines of a measure which cannot be amended to suit the exigencies and building idiosyncrasies of the different towns. The offence of Leeds and its back-to-back houses will not be met by pleas for the neat front gardens, and the abolition of the ugly backyards. In our experience these front gardens are rarely neat; and thus the excuse fails from the start. We do not like back-to-back houses; we said so some time ago, and were duly and not too courteously denounced by a Leeds paper in consequence. But appeals to the business and commercial instincts of our energetic northern peoples against the fulminations of a paper in the slothful south are not very convincing arguments. We grant the business energy of the northern man, though it often appears to rest on the fact that he reaches his office in less than the hour demanded from a London man by the travelling facilities at his disposal. But we doubt if the commercial zest of the northerner does not obscure from him many of the joys of living. After all, while one lives one should endeavour to live among decent surroundings. The making of money should not be the end and aim of life, and civilisation demands that we have some greater outlook on life than the primitive aim of filling our stomachs, important as that may be in the scheme of things. The south is not faultless, dear knows. The London suburban streets, with their pretentious bays, their cheap and paltry carving, their mop trees, their contemptible front gardens, and their farcical back gardens, are at a least an evidence of striving after a measure of refinement. They, at least, monotonous in the aggregate, and repelling in the unit, have not the dreary hopelessness of the slab-fronted terrace houses in our northern manufacturing centres, where the front doors open direct from the street into the front room, and the back doors give upon cramped stretches of asphaltic desolation. Not that the north has stood still in the matter of improvements. But fine squares, monumental civic buildings, splendid parks or tram services, do not a city make. Behind them are unlovely dwellings in treeless streets, to temper the thoughts, the minds, the ideals and aspirations of their tenants. Of what use then to expect high ideals or ennobled thoughts from crude unloveliness? It is expecting grapes from the thistles. The problem will one day be solved. It could be solved by a Bill of one clause. If each dwelling had to be erected on a certain area of ground and was allowed to cover only a fixed proportion of that area, and with certain provisions as to cubical contents and the sizes of rooms, the housing difficulty would be largely removed. It is the ability to crowd houses together that makes land dear, and dear land is bad for builders. A provision such as we suggest might be bad for those of the present generation who have bought land on the old basis; but a readjustment of values would not act more unfairly, perhaps, than a new land tax. It would be no more than the sad experience of those who have bought clothes, jewels, furniture and such things, when they try to realise on them.

The Return of The Native.

So Mr. Thomas Hardy, having reared for himself a goodly edifice of fame as novelist and poet, has returned to his old love, and has prepared plans for a tower and spire for Holy Trinity Church, Dorchester. It is understood that although the literary success that he achieved with "Desperate Remedies" in 1871 led him to renounce architecture as a profession, he has never really ceased to be enamoured of the Mistress Art, but has remained constant to her as an amateur in the best sense of an abused word. It could hardly have been otherwise; for, having been articled to an architect in 1857, he studied Gothic architecture under Sir A. Blomfield, A.R.A., from 1862 to 1867—that is, during the most impressionable period of Mr. Hardy's early manhood, when he was from twenty-two to twenty-seven years old; and now, when verging on seventy, he is going to prove, we make no doubt, the duality of his genius, and that the splendour of his achievements in the realms of literature might have been equalled—it could not be surpassed—in the domain of architecture.

WILLOUGHBY v. TECHNICAL JOURNALS (1902) LIMITED.

At the Assize Courts, Manchester, on Wednesday, April 21st, before Mr. Justice Walton, the case of Willoughby v. Technical Journals (1902) Limited, was mentioned.

Counsel for the Plaintiff: Mr. L. Langdon, K.C., and Mr. Gordon Hewart, instructed by Messrs. Boote, Edgar and Co., Manchester.

Counsel for the Defendants: Mr. Tobin, K.C., and Mr. Hugh Fraser, instructed by Messrs. Bull and Bull, of London.

Mr. Langdon: My Lord, in this case I appear with my learned friend, Mr. Hewart, for the Plaintiff, and my learned friends Mr. Tobin and Mr. Fraser appear for the Defendants. I am happy to say that neither your Lordship nor the Jury will be troubled to hear this case, because seeing the course the Defendants have taken a trial is, I am happy to say, rendered unnecessary. This was an action for libel appearing in a most important publication called "The Builders' Journal and Architectural Engineer," a journal that circulates broadcast amongst architects and builders, and has not only a wide circulation but a deservedly important influence. In that journal, under circumstances which, I daresay, Mr. Tobin will explain to your Lordship, there appeared, on January 13th last, a letter from a correspondent, and an anonymous correspondent. Unfortunately that letter contained grave aspersions on the professional capacity and the integrity of my client, Mr. Willoughby. Mr. Willoughby is a gentleman who has practised as an architect here in Manchester for some 26 years. He is a Fellow of the Royal Institute of British Architects, and is also a Fellow of the Manchester Society of Architects, and in that capacity he has discharged important work as an architect, and has also been called upon to adjudicate on many important matters as an assessor between architects. Naturally, when this letter appeared, attacking him in the way it did, it wounded his feelings greatly and was calculated to do him the greatest of harm amongst his professional brethren and the trades which are connected with them, and these proceedings became a necessity, and they have been taken. I am happy to say on behalf of the Defendants that they have recognised the gravity of the position in which they have placed Mr. Willoughby, and they are willing, through Mr. Tobin, to express their regret and apologise to Mr. Willoughby for what they have allowed to appear in their paper. More than that they consent through Mr. Tobin that, as a substantial mark of the wrong they have done the Plaintiff, and in an endeavour to repair that wrong as far as they can, there shall be judgment for the Plaintiff for 500 guineas and costs.

Mr. Tobin: I appear for the defendants (with Mr. Fraser) who are the proprietors of "The Builders' Journal," and as Mr. Langdon has stated, it is a paper of very high standing and reputation amongst members of the profession amongst which it circulates. It is read by a great many builders, architects and engineers throughout the length and breadth of the country, and anyone looking at its issues, any of them, will see that its articles are regularly most serious and earnest articles, and anything like a libel is absolutely and wholly alien to its character. In this case the letter complained of was communicated to the paper by a correspondent. It was received in hot haste of going to press, and it was inserted by absolute inadvertence. The directors, when they saw the letter, when it was complained of, at once recognised, as gentlemen, that there was only one honourable course for them to pursue, and that they do pursue in this case. They say, through me, that the statements are wholly unfounded. They have never sought to justify those statements from the very first, and in the frankest and fullest way they express their regrets, and tender to the Plaintiff their sincere apology, and the proprietors of the paper further desire to say this, as showing they are anxious to do what they can to put the matter right, that they propose to report in two successive issues of their journal what I am now saying on their behalf, so that everyone who read the original letter complained of may have a reasonable opportunity of reading this withdrawal in Court to-day. I only wish to add that there has never been on the part of any of the proprietors of this paper, or in the minds of any of their staff, the smallest personal feeling against the Plaintiff. On the contrary, there have in previous issues of this journal been articles laudatory of the Plaintiff's work. The Directors feel, and authorise me to say, what I have now said on their behalf, and they have taken a proper course and a dignified course in this matter.

Mr. Justice Walton: I quite understand. The statement you have made expressed properly what they have done. They seem to have made an unfortunate mistake, but there is no suggestion that they did it maliciously. It was a mistake calculated to be injurious to the Plaintiff, and I think they have taken a proper course.

Mr. H. M. Bowes has removed to Charlton, Constant Spring, Kingston, Jamaica.

* * *

Mr. Sydney Searle has removed from 6, Staple Inn, W.C., to 7, Stone Buildings, Lincoln's Inn, W.C.

* * *

Mr. T. E. Eccles, F.R.I.B.A., has been re-elected President of the Liverpool Architectural Society.

* * *

The Bermondsey Borough Council has compiled a return showing the cost of the disposal of refuse for one year in the metropolitan boroughs. For the year a million tons of refuse were disposed of at an average cost of 9s. 1d. per ton. The cost per year per house came to 11s. 10d. In six boroughs there is some adjustment of accounts where a refuse destructor is worked in conjunction with the electricity undertakings. The average amount charged to electricity account—and equivalent per unit generated—is .35d. per unit. In Bermondsey 492,948 units of electricity were generated by means of 19,648 tons of refuse.

* * *

The Duke of Argyll has consented to open the Imperial International Exhibition, the White City's successor, at Shepherd's Bush. The opening ceremony will take place about May 18th. The great Imperial Tower, which is one of the new features, will then be inaugurated, and probably the opening ceremony will take place in it. Three thousand men are at work daily in the grounds preparing for the new exhibition, and the number is to be immediately increased to 5,000. Hundreds of painters with long brushes are engaged in transforming last year's white palaces into the component parts of harmonious colour schemes. The grounds have been extended from 140 to 150 acres, and a number of new buildings, in which many interesting exhibits will be housed, have been added. Large sums have been spent on new roads.

* * *

Employment in the building trades in March last, of which returns have just been published in the "Labour Gazette," was slack in all parts of the United Kingdom, except with painters, who were fairly well employed. It showed an improvement compared with February, but was worse than in March, 1908. Returns received from 591 firms employing 34,573 workpeople at the end of March show that, compared with a month ago, there were increases in the number of skilled workmen employed of 3.6 per cent. in London and 3.4 per cent. in the provinces; while in the case of labourers there were increases of 3.4 per cent. and 0.9 per cent. respectively. Compared with a year ago, there were decreases in the number of skilled workmen of 0.3 per cent. in London, and 14.5 per cent. in the provinces; the decreases in the case of labourers being 2.2 per cent. and 19.9 per cent. respectively.

THE ARCHITECTURAL WORK OF THE LONDON COUNTY COUNCIL.

By W. E. RILEY, F.R.I.B.A., Superintending Architect of Metropolitan Buildings and Architect of the London County Council.

Abstract of a paper read before the Royal Institute of British Architects, April 19th, 1909.

At the London County Council there are thirteen main committees which deal with constructional works, these main committees being divided into 35 sub-committees for purposes of detail, and this part of the Council's operations range in scope from the construction of one of the largest generating stations ever erected in the British Islands to a three-roomed cottage, or a structure of even less importance. Therefore the author would not attempt to go through the details of the whole of the architectural work which has come within his experience during the ten years he has held office under the London County Council, but would indicate only the salient features of the more important items.

Housing of the Working Classes.

Housing schemes are framed under the Housing of the Working Classes Act, 1890, with its amendments of 1894, 1900, and 1903, and are carried out under the three subheads Parts I., II., and III., of the principal Act. Part I. of the Act deals with large clearance schemes which entail an obligation to rehouse the persons displaced. These schemes are carried out by the "local authority," which, for the County of London, is the L.C.C. Part II. is the diminutive operation on the lines of Part I., and the Borough Councils as well as the County Councils are empowered to act. Part III. permits voluntary action on the part of all local authorities, which, for London, embrace the Borough Councils and the L.C.C. The Local Government Board under the amendment of the Act dated 1903 became the confirming authority for all operations under the Housing Acts. In addition to the Housing of the Working Classes Acts under which powers are prescribed, large displacements arise under special Acts of Parliament. These entail rehousing obligations based practically on the same procedure as under the Housing Acts.

It has been laid down that not less than 400 cubic feet of air space per person for adults should be provided in the Council's dwellings, 200 cubic feet per head being permitted for children under 10 years of age, and that the number of persons should not work out at more than two to a room.

Examples of important schemes undertaken by the L.C.C. under Part I. of the Housing of the Working Classes Acts are:—Boundary Street, Bethnal Green; Churchway, St. Pancras; Webber Row, Southwark; Wellington Place, and King's Bench Walk, Southwark; Union Buildings, Clerkenwell.

There are two generally accepted forms of construction adopted in the planning of block dwellings, viz.: (a) Self-contained tenements; (b) Associated tenements. (a) The self-contained tenement has its own independent scullery, water-closet, and offices; and, except where a common laundry is provided, its own washing arrangements. (b) The associated type shares with other tenements the sculleries for preparing food, sinks, water-closets, and wash-houses. Latterly the L.C.C. has invariably adopted the so-called "self-contained" plan. A good example of a large scheme approaching completion is the Bourne Estate and Union Buildings, Bourne Estate consists of two parts. One part, viz., the Reid's Brewery section, is 3⅛ acres in extent, and was acquired in connection with the Holborn-to-Strand Improvement and Southampton Row Widening schemes, which contained a clause stipulating that all persons displaced who had permanent employment in the district should be rehoused within a mile of their former dwellings. The other part, the Union Buildings section, was an insanitary area of 1½ acres cleared under the Clerkenwell and Holborn Improvement Scheme, 1899, under which the obligation was to rehouse 1,414 persons displaced. The Reid's Brewery scheme of rehousing was approved by the Secretary of State, and provides accommodation for 3,902 persons. The average area of the living rooms is 150 ft. super, and that of the bedrooms 100 ft. The average cubic space in the living rooms is 1,275 ft., and in the bedrooms 850 ft. The buildings were planned for the internal blocks to lie north and south so as to obtain the maximum of sunlight in the living rooms, and each tenement has at least one room looking on a garden. The type of plan designed for these buildings is an improved "balcony plan," arranged so that the living rooms and the bedroom do not look on to any of the balconies, and have an unobstructed light. The buildings are five storeys high with a few attics, and are constructed of fire-resisting material, with steel joists and concrete floors. All the sculleries and water-closets are separated from the habitable rooms by ventilated lobbies. The type of plan of the buildings has, since the completion of the first block, been adopted by other authorities for working-class dwellings, amongst others by the Metropolitan Boroughs of Bermondsey and Hackney. This type of plan has been adopted also for Darcy buildings, a small five-storey block of dwellings erected for rehousing some of the persons displaced through the widening of Mare Street, Hackney. The site, though narrow, is an excellent one, as the building overlooks London Fields, a permanently secured open space. The dwellings will accommodate 190 persons in 25 tenements of two rooms and 15 tenements of three rooms. The total cost of the building including all incidentals amounted to £9,719 11s.

Dwellings erected under Part II. are: Cranley Buildings, Holborn; Cobham Buildings and Borough Road Buildings, Southwark; Ann Street Dwellings, Poplar; Sylva Cottages, Deptford.

PALACE OF SOCIAL ECONOMY AND OF THE CONGRESSES AT THE PARIS EXHIBITION OF 1900. CHARLES F. MEWES, ARCHITECT.

Bruce House—a lodging-house—at the corner of Kemble Street and Drury Lane, is an example of the fulfilment of part of the obligation to rehouse under the Holborn-to-Strand improvement. Bruce House contains 709 cubicles in all, affording accommodation for 698 lodgers (men) and eleven porters. It was opened in 1906, and cost, with the necessary machinery and apparatus for lighting, ventilation, etc., £50,020. The elevations are of red brick facings, relieved with glazed and Luton bricks, stonework, and roughcast, and the roofs are covered with green slates. The plan of the building is E-shaped above the ground floor, so arranged as to provide adequate light and air to the cubicles. Each lodger has an independent cubicle having a minimum width of 4 ft. 10½ ins., with an area of 36 ft. super, and lighted by a separate window.

Under Part III. of the Housing Act the operations are carried out on a purely commercial basis, and the cost of land is not written down. The plans and details of the dwellings are not subject to approval by Government Departments. Two fairly large Part III. estates on which block dwellings have been erected are the Caledonian Asylum Estate, Islington, and Wessex Buildings, Holloway. Caledonian Estate is about two acres in extent, being acquired by the Council under Part III. of the Housing Act, and consequently bears no rehousing obligation. The estate is therefore charged with the total capital expended in respect of land, buildings, gardens, etc., and all other outlay in connection with the development of the estate. After making due provision for all expenditure, including debt charges, the accounts show a profit of 1.15 per cent. on the gross rental. The buildings are five-storey block dwellings containing 272 tenements, the four back blocks being of the improved balcony type. The front block has closed staircases with windows and white glazed tiled dado, giving approach at each landing to four tenements, averaging nine rooms for each set of four tenements. On the basis of two persons to the habitable room, six one-room tenements, 116 two-room, 146 three-room, and four four-room tenements accommodate 1,384 persons. The estimated cost of the buildings and incidentals was £57,396 10s., and worked out at 7.86d. per cubic foot.

The most extensive developments under this part of the Act, however, have been the laying out of "cottage" estates. Three large estates of this kind are in progress at the present time, while a fourth, the Old Oak Common Lane Estate, has been acquired, and a scheme for development is in progress. Totterdown Fields Estate at Tooting comprises 38¾ acres. The roads have all been formed and cottages have been erected on about 25½ acres. Norbury Estate comprises about 30 acres. The roads have been formed on about 18 acres, and cottages erected on about 5 acres. White Hart Lane Estate is divided into two parts. The larger or southern section comprises 178 acres; the roads have been formed on about 35½ acres, and cottages erected on about 18.9 acres. The northern section comprises 46 acres, and is not yet ripe for development. The Council has all along intended that this isolated portion should wait till the neighbourhood has opened up and become ready for building accommodation. Endeavour has been made to render the cottage estates successful, both from a commercial and architectural point of view. Variety in planning and treatment of the elevations has been arrived at. The cottages are two-storey buildings arranged in short terraces with spaces at intervals, and they are almost invariably set back from the forecourt fence 5 to 14 ft. Each cottage has its own front door, and its own plot of garden ground in rear. In every cottage suitable fittings are provided.

In no case have more than 33.33 cottages per acre been put on the land, the average number being about 29.14.

For large works, sometimes "open," sometimes "selected," tenders are invited. The cost of block dwellings, including professional and incidental charges, erected during the past five years, has worked out at about an average of £86 per room, or 9.8d. per cubic foot. For cottages, however, it has been found generally most economical to obtain tenders as follows:—The working drawings of the buildings are prepared to ⅛th in. scale, and a few essential details to a larger scale. A simple specification is prepared giving very little detailed description of construction, but specifying the quality of the articles required. To the specifications are attached the Council's instructions for tender, form of contract, and schedule as to rates of wages and hours of labour. No bills of quantities are prepared, but each contractor invited to tender is supplied with a set of drawings, specification, form of contract, etc. I find under this procedure that there is no difficulty in getting excellent contractors, both in large and smaller ways of business, to compete. This simple means of obtaining competition works admirably, not only in the initial process of obtaining tenders, but in the adjustment of variations, etc., for at every step the architect knows just how the cost of the work stands. Care has to be exercised in the granting of advances for work done, but there is no difficulty in framing a table of values on which to work.

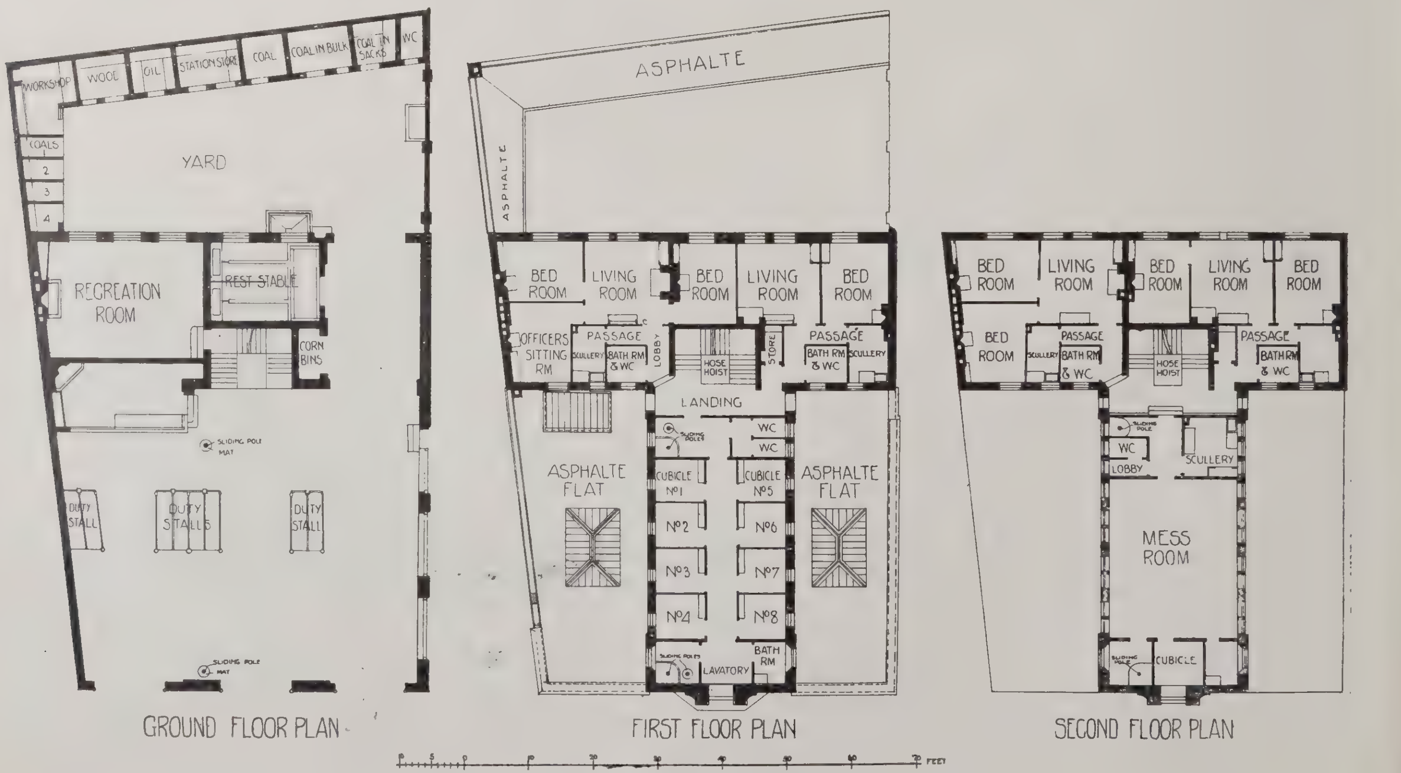
The cost of cottages varies considerably according to district.

Cottages recently erected have cost, including professional and incidental expenses:—

At Totterdown Fields Estate, Tooting, 5-roomed cottages, £349 to £384; 4-roomed, £235 to £273; 3-roomed, £192 to £216; the average cost per cubic foot being 6.14d. At White Hart Lane Estate, Tottenham. 5-roomed cottages, £253 16s.; 4-roomed, £204 4s.; 3-roomed, £168 16s., the average cost per cubic foot being 4.97d.

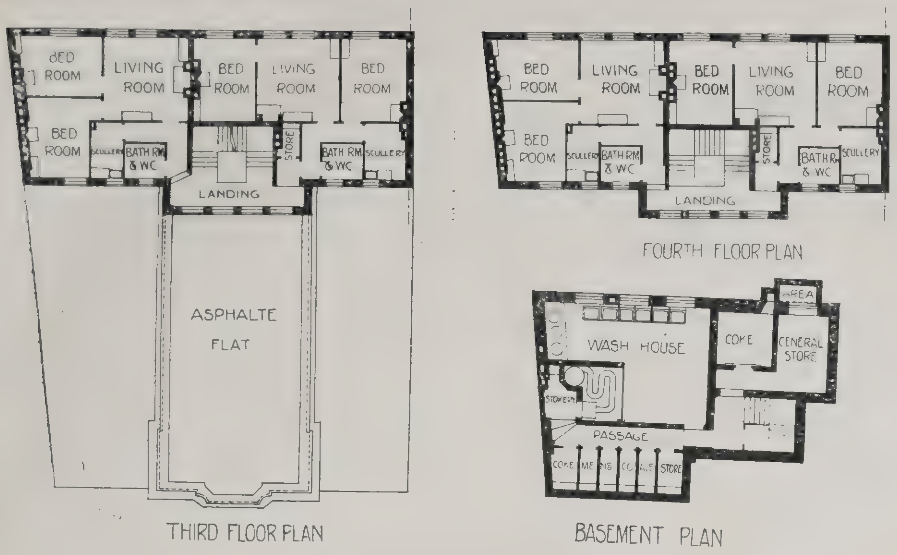
Electricity Buildings.

In 1902 it became necessary to construct buildings in connection with the electrification of the whole of the tramway system within the County of London. This involved the erection of a large generating station at Greenwich, and a repair depot, car sheds, and sub-stations placed at convenient positions near the routes. Of these buildings 22 sub-stations are already in full work transforming the current, 10 car sheds accommodating 1,324 cars are in use, and the Greenwich Generating Station is approaching completion. The Greenwich Station is to accommodate plant for generating high-tension 3-phase current at 6,600 volts, to supply the substations on both sides of the river for tramway purposes. The site adjoins the Thames about 150 yards east of the Greenwich Hospital. The area is about 3.7 acres, with a frontage to the river of about 240 ft. The building is divided into two bays, one of which is occupied by the boilers, and the other by the engines, turbines and dynamo machinery. It is erected on a concrete raft 6 ft. thick, which extends over the whole area of the boiler and engine rooms. In this concrete raft are placed R.S.J.'s forming grills at the various points where stanchions carry



GROUND FLOOR PLAN. FIRST FLOOR PLAN. SECOND FLOOR PLAN.

KENSINGTON FIRE STATION: PLANS. W. E. RILEY, SUPERINTENDING ARCHITECT, LONDON COUNTY COUNCIL.



THIRD FLOOR PLAN

FOURTH FLOOR PLAN

BASEMENT PLAN

KENSINGTON FIRE STATION: PLAN.

the superstructure. The boiler-house is 455 ft. 9 ins. long, 84 ft. 6 ins. wide, with an average height of 105 ft., and accommodates 48 boilers of the Stirling and Babcock and Wilcox types arranged in 24 batteries of two boilers each, 12 batteries on either side of a central gangway. The engine-house is built parallel to the boiler-house. The dimensions are—455 ft. 9 ins. long, 83 ft. 6 ins. wide, with an average height of 103 ft. The floors of the engine-room and of the galleries, which provide access to the steam-valves, are constructed of coke-breeze concrete covered with terrazzo paving. The internal wall facings are of glazed brick. The gantry to carry a 50-ton travelling-crane is supported by steel stanchions which also carry the roof principals. The roof framing of the pump-house is of steel, with brick arches. These are covered with concrete, on which asphalt is laid, forming a flat to carry a 50,000-gallon tank, which provides water for the boilers. An endeavour has been made to treat the elevations of the station with simplicity. The materials selected are stock-bricks, with Portland stone for sills, copings, and dressings. The roof is covered with Bangor slating and patent glazing (Luxfer Prism Syndicate, first portion; Messrs. Helliwells, second portion). The total cube of the building is 9,670,000 cubic ft.

New Cross Car Shed.

This car shed, on the south side of New Cross Road, covers nearly four acres, and accommodates 295 double deck cars. To obtain a level working floor it was necessary to form an average gradient of 1 in 27 from the New Cross Road and to excavate the back portion of the site to a depth of 14 ft. The plan is roughly a square, and nine bays of roofing run north and south, the standard span being 43 ft. 3 ins. between centres of stanchions. The westernmost bay is arranged as workshop and paint shop. Generally the walls are of yellow stock brickwork with a dado of salt-glazed bricks 5 ft. 6 ins. high, to resist grease. The stanchions, roof-trusses, and girders are of mild steel, the total weight of steelwork being about 1,700 tons. The roofs are covered with blue Bangor slating and patent glazing. The elevation to the entrance is of Portland stone. The building cost about £87,000.

Technical Institutes, etc.

The special educational establishments which have recently been created are:—The Central School of Arts and Crafts and the London Day Training College in Southampton Row; the School of Engineering and Navigation at Poplar; the Westminster School of Art and Technical Institute; the School of Arts and Crafts at Hammersmith, and other Technical Schools at Shoreditch, Paddington and Brixton.

The Central School of Arts and Crafts and the London Day Training College.

The school premises extend 107 ft. along the Southampton Row frontage; the training college occupies the remaining 110 ft. The buildings were placed in contiguity, so that economy might be effected by the common use of rooms by the students of both school and college, and by avoiding the reduplication of heating apparatus, plant, etc. Incidentally the combination of the two buildings under one roof lends itself to breadth of treatment. The college is for the professional training, in teaching, of students who are receiving their academic education in the University of London, at King's, Bedford, and other colleges. The school building has a basement and five other floors, and an endeavour has been made to classify as far as possible the various trades, and to devote a whole floor to each of the main groups. The principal drawing and modelling studios are on the fourth floor, and are carried up through the fifth floor to the roof, and are top-lighted.

The college building has seven storeys, including the basement and entresols. A controlling factor of the lower portion of the building was the lecture theatre, which it was necessary to place so as to be convenient of access from the adjoining Central School. This theatre, which is seated for 300, is situated on the ground floor, the remainder of which is occupied by the entrance hall and staircase and the upper part of the gymnasium.

The height of both school and college from the street to the cornice is 75 ft. 6 ins. Above this the roof, which is covered with lead, rises to a further height of 12 ft. The facades generally are faced with Portland stone, the lower part to 12 ft. 6 ins. above the street with granite from the Colcerrow Quarries in Cornwall. Dressings of Hopton Wood stone have been used in the halls and staircases and in the exhibition hall. The construction throughout is fire-resisting, and provision is made for alternative means of escape in case of fire. The ventilation is on a simple extract system, fresh air being admitted through ventilating radiators. The cost of the two buildings, exclusive of equipment, is estimated at approximately £115,000.

The School of Engineering and Navigation at Poplar

cost approximately £27,000, exclusive of machinery equipment. The main front is faced with Portland stone; other walls have stock brick facing. The columns in the entrance hall are of Hopton Wood stone. The roof is covered with green Cumberland slates. The casements throughout are of steel.

The Westminster School of Art and Technical Institute

is somewhat typical of the Institutes. It had to be designed, however, as an addition to the existing School of Art erected by the late Baroness Burdett-Coutts, and recently taken over by the Council. The construction is fire-resisting throughout. The class-rooms are about 14 ft. high; the corridors are ceiled about 10 ft. up, and the space above utilised for the pipe mains, electric-light leads, and ventilation ducts. Casements are of steel, arranged so that the windows can be cleaned from inside the building. Ventilation is by a simple extract system, with electric fans at roof level operating through metal ducts, fresh air being admitted through ventilating radiators. The heating is by low-pressure hot water. The corridors are paved with hard red tiles, the class-rooms with pitch-pine blocks. The joinery generally is yellow fir, painted; the smoke doors and staircases are of oak in no place less than 2 ins. thick. The class-room walls are plastered: those of the workshops are fair-faced with gault brick. The lower part of the facade is of Portland stone, the upper of stock brick, with Portland stone window jambs and heads, cornice, and quoins. The forecourt railings and gates are wrought iron. The buildings cost £21,000.

Fire Brigade Stations.

The present Cannon Street station, which stands at the corner of Cannon Street and Queen Victoria Street, was erected by the Works Department of the Council at a cost of £16,000. The building, which is faced with Portland stone on both fronts, was completed in 1907. Kensington station was erected on a site covering an area of 6,100 sq. ft. The building, which was completed in 1905, was erected by Kerridge and Shaw, of Cambridge, at a contract price of £10,980. The elevation generally is of red brick with Portland stone dressings, the portion immediately fronting the street being entirely faced with Portland stone.

Vauxhall is a typical sub-station. The building was erected by the Works Department at a cost of £8,400, and the station was completed in 1903. The elevation is of picked stocks with Portland stone dressings. It is now being extended to the capacity of a full station.

Street Improvements.

The Holborn-to-Strand improvement presented the opportunity of making as great a mark on the architectural appearance of London as is likely to occur for many years to come. Improvements between Holborn and the Strand were first mooted in 1836, when a Select Committee of the House of Commons was taking evidence as to necessary improvements in the metropolis. A connecting street was proposed between Holborn and the Strand by way of Lincoln's Inn Fields. Improvements were suggested by James Pennethorne in 1847 in connection with the building of a Record Office on the Rolls Estate, who proposed a spur street almost on the line of the western arm of Aldwych. Again, a proposal was made by Mr. Teulon in 1878. It may be of interest to note that this scheme shows an island garden in the Strand, not unlike that recently proposed when the suggested setting back of the Strand frontage was under consideration. The desirability of an improvement was first considered by the Metropolitan Board of Works in 1855 and again in 1883. Their successors, the London County Council, have also considered many plans for this improvement. One point of prime importance was the question of the retention or removal of the Church of St. Mary-le-Strand. Its suggested removal aroused public opposition, with which this Institute can probably sympathise, as it undoubtedly forms a highly picturesque object in all views of the Strand, and its removal would have deprived that part of London of one of its most picturesque and interesting features. Previous schemes showing the new thoroughfare terminated by the church had been objected to, and the crescent-shaped Aldwych, with the "island site" between that street and the Strand, was finally decided upon.

The Council, in the earlier stages of the improvement, fully realised the necessity of obtaining the best results in the new streets which, while affording improved facilities for traffic, it was hoped would result in an architectural treatment of great dignity; it was held that, if a high standard of excellence were obtained the cost of the improvement would be reduced. This Institute cooperated with the Council in selecting eight architects, who were invited to submit sketches for the various frontages. Those selected by the assessors as submitting designs which were considered suitable for adoption by prospective lessees were Mr. H. T. Hare, Mr. W. Flockhart, Mr. M. Macartney, and Mr. L. Stokes. However desirable in the interests of architecture the adoption of any of these schemes would have been, the Council has hesitated to impose upon its lessees any coherent scheme as suggested by these exponents, with the result that each design submitted for new buildings is considered on its own merits. The Council has become, by reason of the surplus land acquired in carrying out improvements, one of the largest landowners of London, with a rent roll of £325,000 a year, and having regard to the interests of the ratepayers, it is most desirous of avoiding any restrictions as to elevation, etc., which might delay the letting of land. The building conditions have been amended in such a way that I do not hesitate to describe them as less restrictive than those in operation on any other large London estate. The result indicates that the architectural treatment is decidedly above the average hitherto attained in other metropolitan improvements. If the general effect of the remainder does not fall below this standard the result will be one for congratulation.

The Council preserves a suitable record of architectural and historical buildings which are demolished in connection with improvement schemes. Every building is carefully surveyed, and, if desirable, suitable photos are taken; where any valuable detail, either in stone, wood, or iron, is found, a measured drawing is prepared.

In connection with street improvements, which form a very important part of the work of the Council, attention is at once arrested by the fact that the actual or estimated gross cost of county improvements effected by the Council since 1889, excluding bridges, has amounted to £11,000,000, towards which the local authorities have in some cases contributed. This large sum can only be regarded as the cost of patching up mistakes and remedying deficiencies which should never have arisen had any attempt been made originally to lay out London on a definite plan.

Discussion.

Mr. Andrew Taylor, in proposing a vote of thanks to Mr. Riley, observed that in considering the architectural work that had been put before them, it should be remembered that Mr. Riley's position was an extremely difficult one, as it was not always possible to convince the numerous committees and sub-committees as to what was architecturally the best course to adopt. Some of the L.C.C work was of an engineering character; but it must be admitted that Mr. Riley had tackled the architectural problems very successfully. The speaker, however, questioned how far work of this nature should be done to the exclusion of the general profession. He thought that any exceptional or special work should be thrown open to competition; and he felt sure that Mr. Riley would raise no objection to this view. He had greatly appreciated Mr. Riley's paper.

Mr. T. J. Bailey, in seconding the vote of thanks, said he could support the remarks made by the previous speaker as to the difficulties that arise in working for various committees, and to the limits of economy.

Mr. John W. Simpson, in supporting the vote of thanks, observed that he would like to strike a more enthusiastic note than had characterised the remarks of the previous speakers. He had been greatly impressed by the dignity and beauty of much of the work they had seen upon the screen. He had to admit that it could well bear comparison with the very fine examples of American architecture they had seen in connection with the paper recently read by Mr. Swales. He was most happy to express his high appreciation of Mr. Riley's lecture.

Mr. William Woodward, also supporting the vote of thanks, said that the paper was terse and very much to the point. He had no hesitation in saying that Mr. Riley's fire station designs would meet with the unqualified approval of architects generally.

Mr. Riley briefly replied.

EXTERNAL LEADWORK.

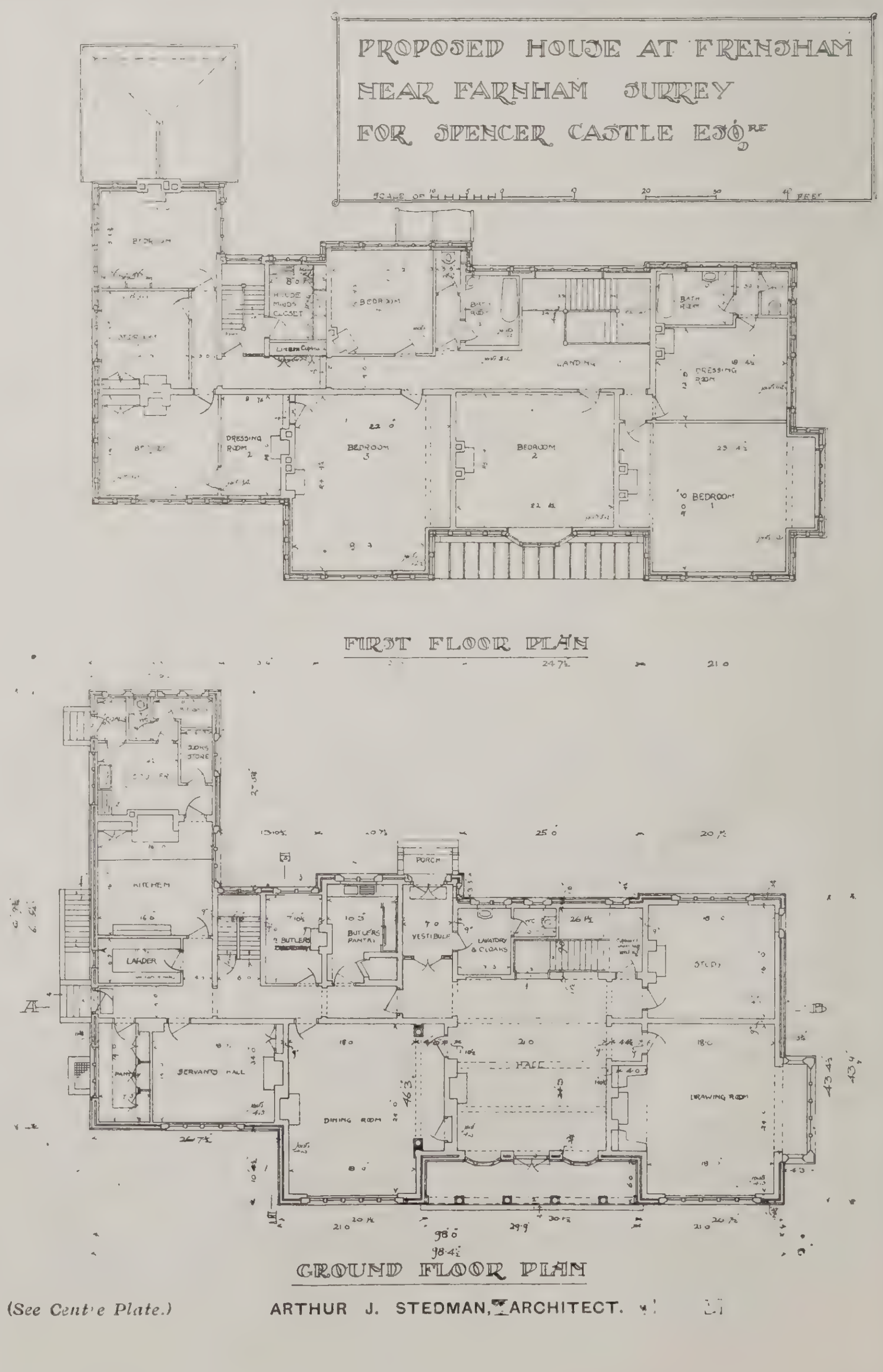
Mr. F. W. Troup, F.R.I.B.A., lecturing at the Carpenters' Hall, London Wall, E.C., said that he had had some difficulty in arriving at a title for his subject, but the description he had used, namely, "External Leadwork," seemed the best, as it excluded sanitary work.

The care, accuracy and precision which must be observed in all modern sanitary work absorbs so much of the plumber's time, that the other branch of his craft—the decorative and ornamental use of lead—had suffered. Lead has lost caste, and from being a material of which men were proud, and eager to possess as a covering for their temples, etc., has dropped into a position of utilitarianism. It is regarded by some in the same light as galvanised iron.

Comparing cast sheet lead with milled or rolled lead, the lecturer remarked that the latter is now always used for roof work. Originally all lead for roofs was made in sheets specially cast on a sand bed. Ever since the time of Sir Christopher Wren, however, the use of milled lead gradually increased; but to this day the whole of the leadwork for the roof and other parts of the building of St. Paul's Cathedral is cast in sheets in the crypt, in a casting frame 17ft. long by 6ft. wide.

Milled lead has one advantage which has had much to do with its introduction, namely, that it can be made of any thickness. A great deal of skill is required to cast sheets of lead of 6 pounds to the square foot. It is said by some plumbers, he continued, that sheets cast in the old way are hard and more difficult to work. This may be true, but it is a mistake to say that they cannot be wrought up as well as milled lead. Another objection sometimes raised is that cast sheet lead cracks, and has holes in it. This applied chiefly to the thin sheets, and for sheets weighing 6 pounds to the square foot the lecturer recommended the use of milled lead.

He wished to distinguish clearly between the two kinds of sheet lead, namely, "cast"



(See Centre Plate.) ARTHUR J. STEDMAN, ARCHITECT.

and "milled"—that which is rolled out between steel rollers. By the aid of a slide of an old engraving showing the interior of a plumber's shop, with the various implements of his trade, the lecturer next described the preparation of cast sheet lead. The casting frame is like a long table, with a rail about 4in. high round it. This is covered with sand spread evenly over the surface about 2½ins. thick. This *must* be damp—it is best to keep it permanetly damp—well mixed, and about the consistency of snow when it is right for snowballing. The sand is levelled down with a strike, with a long handle, and finally polished with a float. The lead, having been melted, is ladled out into the head-pan. The lower end of the sand bed is made to slope down rapidly, so that the superfluous metal can run away into a pot. The strike, which is raised off the sand the thickness of the sheet to be cast, is brought close up to the head-pan, and when the lead is emptied on to the frame the strike is rapidly run the full length, sweeping off all superfluous metal. The boards forming the bottom of the casting frame should have holes bored in them, to allow the steam to escape, otherwise the sheet will blow up in a bubble, which will be knocked off by the strike. Many other details were furnished by the lecturer, who next passed on to leadwork on roofs. A slide was shown from Viollet-le-Duc, showing how leadwork was laid on the old French cathedrals. It weighed 10lbs. or 12lbs. per square foot, and was intended to last 1,000 years, yet so laid that any sheet could be replaced without disturbing those around it. The open rolls which they used were much more effective than the modern wooden cored rolls, and the boards on which the lead was laid had spaces of from 1in. to 1½ins. between them. This was better for the timber, but could only be done where the sheets of lead were very stout.

Some slides followed of Beauvais cathedral roof, showing the method of arranging the rolls, and the hooks for keeping the sheets in position; Chalons-sur-Marne, with its herring-bone rolls, also famous for its roof covered with figures coloured; a sketch of the method of using lead rolls on Godalming Church spire; the fleche from Gordon's College, Aberdeen, showing the rich effect of the fringing on the angles; the upper part of a spire at Calais, the lecturer drawing attention to the English flavour of the work, which probably dates back to the English occupation. We will now, he said, run through a few more elaborate examples. The fleche at Amiens, from a drawing in Burgess's books was shown, and attention was drawn to the cast lead ornament, gilding, lead figures, tinning ornament, and foliage; the hospital at Beaune; and Jacques Cœur's house at Bourges.

Then we come to the later use of lead for gutters and pipes for taking water off the roofs, which superseded gargoyles. An example was shown of a very simple one from Friesland; a lead cistern from Poundisford Park, with the head and pipe over—this example was round, which the lecturer remarked was obviously the correct shape. square or rectangular ones need ties, otherwise they would bulge when filled with water. Also heads were shown from Coventry, Durham Castle, Knole and Bucklebury, near Reading. Next, he said, we come to leadwork covered with colouring and gilding. Several examples were shown from St. John's College, Oxford, from drawings made by the lecturer in 1889. Next a slide was shown of several heads from Abbot's Hospital, Guildford, in which tinned ornament had been used, and this method of decorating was fully described by the lecturer.

Referring briefly to the lead statues, he said most of those we see now are merely cheap substitutes for bronze. Lead is really an unsuitable material for this kind of statues, for unless elaborately supported inside by iron rods, they are bound to collapse. The mediæval method was to build up the skeleton in wood or iron, and then to hang on the lead in plates, beaten up and fixed together.

Lead fonts were next briefly dealt with, and several examples shown, including one from Dorchester, in Oxfordshire, which had been cast flat, bent round and joined, which was the method usually adopted.

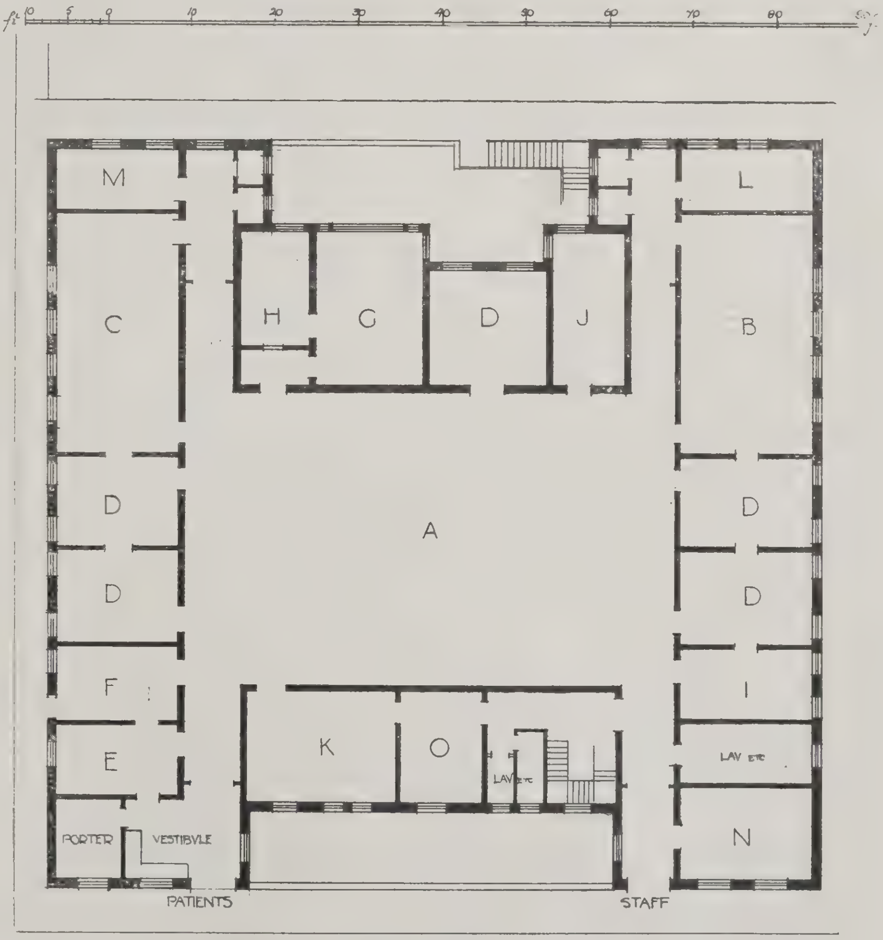
In conclusion, several very beautiful examples of modern leadwork were shown, including a lead head and clock turret and clock face by the lecturer, from the house of Mr. Joseph King, near Wittey; a cistern by Mr. Weir Schultz; a panel by Mr. Prior; and two vases by Mr. Lethaby.

ROYAL SOUTHERN HOSPITAL (LIVERPOOL) EXTENSION COMPETITION.

Designs for an out-patient department to the hospital were invited from a limited number of architects, Mr. Alfred Culshaw, F.R.I.B.A., being appointed assessor. It was stipulated that the cost (including the necessary quantities, the architect's commission, fixed fittings, electric light, and heating) should not exceed £8,000, the author of the first selected design to carry out the work, the second and third designs to be awarded premiums of £21 and £10 10s. respectively. The drawings required consisted of ground and basement plans, two sections and four elevations, all to ⅛-in. scale. The necessary accommodation on the ground floor was to include a main external door wide enough for the simultaneous ingress and egress of patients; a vestibule and small porter's office, a receiving room for patients, close to vestibule, and about 120ft. super.; a waiting hall to accommodate 175 seated people, from which the dressing and consulting rooms could be directly approached; lavatory and closet accommodation, the latter in basement if necessary; a retiring room for medical staff, about 100ft. super.; a retiring room for nurses, about 100ft. super.; a private entrance for joint use of medical and nursing staff, this not essential; an isolation room about 100ft. super., near to the receiving room, and provided with an external door; male and female dressing-rooms, about 450 and 400ft. super. respectively; five consulting rooms, each about 150ft. super., and an examination room about 100ft. super., adjoining one of the consulting rooms; a minor operation theatre, about 240ft. super., also adjoining and in connection with one of the consulting rooms; a recovery room, about 100ft. super., adjoining minor operation theatre; a dispensary about 200ft. super.; a splint room about 260ft. super., the latter to be in the basement, if necessary, where accommodation was required also for a low-pressure boiler and for fuel, and where 1,200ft. super. of space was to be provided for subsequent appropriation.

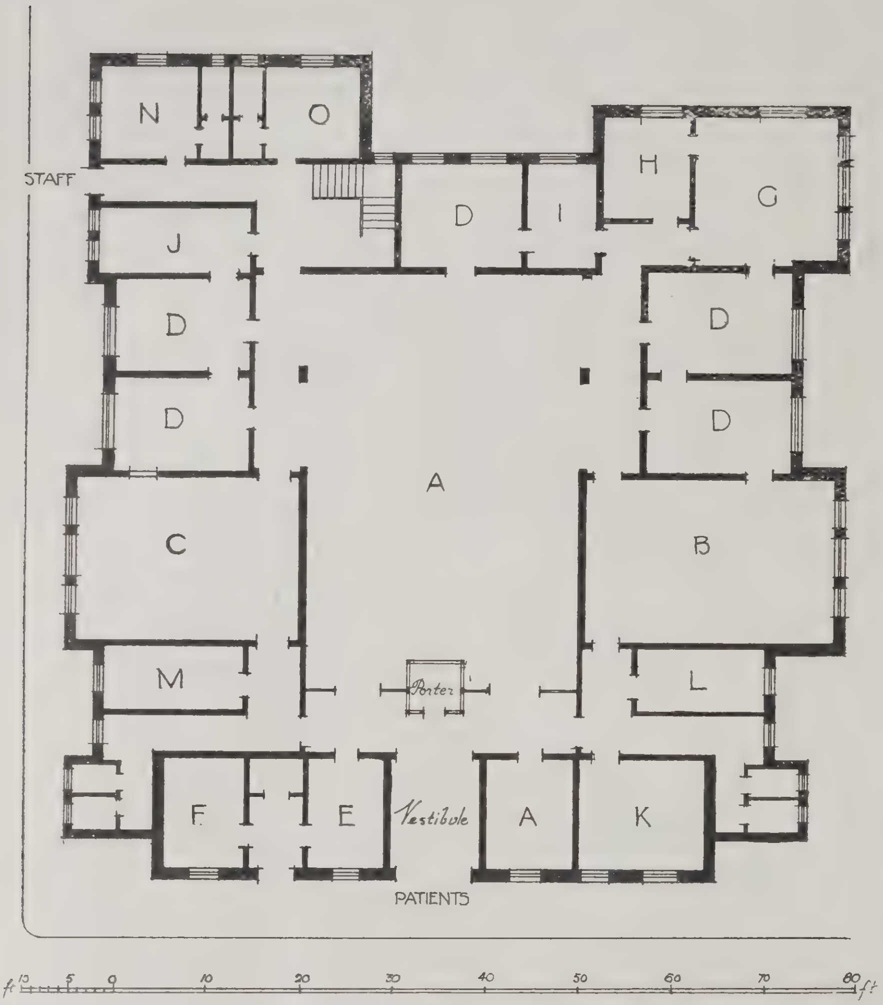
It was required that the elevations should be of red brick with stone dressings, and harmonise with the existing hospital and nurses' home, and should be devoid of superfluous ornament. We must confess that this

① MESSRS HAIGH & THOMPSON.



A	WAITING HALL
B	MALE DRESSING ROOM
C	FEMALE " "
D	CONSULTING ROOMS
E	RECPTION ROOM
F	ISOLATION ROOM
G	OPERATING ROOM
H	RECOVERY ROOM
I	EXAMINATION ROOM
J	EYE ROOM
K	DISPENSARY
L & M	MALE & FEMALE BATHROOMS
N	DOCTORS ROOM
O	NURSES ROOM

② MESSRS BRIGGS & WOLSTENHOLME & THORNLEY



latter requirement has been fulfilled to the letter in almost every case, though whether the significant clause in the conditions requesting the architect to state his fee in the report accompanying his work, was the determining factor, we hesitate to say.

The first selected design is that of Messrs. Haigh and Thompson, Imperial Buildings, Exchange Street East, Liverpool; the second, that of Messrs. Briggs, Wolstenholme and Thornley, May Buildings, North John Street, Liverpool; the third, that of Messrs. Willink and Thicknesse, 14, Castle Street, Liverpool. From the purely utilitarian point of view there can be no question but that Messrs. Haigh and Thompson's plan is the most satisfactory arrangement submitted.

The main entrance is, perhaps, rather skimped, this being due to the placing of the staff entrance on the same front in a balancing position. And though this arrangement does not result in as satisfactory an elevation as is obtained by one central entrance on the main front, the plan is distinctly more workable. (In the other designs it will be noted the staff entrance is in the side street.) To us the most admirable feature in the plan is the disconnection of the dressing rooms and their attendant baths from the main hall, and the accessibility of the consulting rooms from the latter, which is well cross-ventilated on either side. It will be seen that, as in the other plans, the hall rises above the lower surrounding rooms, and is lighted by a clear storey. The convenient central position of the operating theatre also compares very favourably with the alternative arrangements adopted by the other competitors. Probably the principal defect in the plan is the treatment of the isolation room, which is not isolated at all. However, in actual practice we believe that this is not found to be a matter of vital importance. The general disposition of the rooms and the convenient access everywhere obtained mark the plan as by far the most ingenious. With regard to the elevations, we must admit disappointment: they are impersonally mediocre to a degree.

In the design of Messrs. Briggs, Wolstenholme and Thornley, we should have liked to see more evidence of a rigorous regard for economy. Considerable trouble seems to have been taken to ensure the isolation of the isolation room by the planning of a disconnecting lobby; and the main entrance is commendably adequate, but otherwise there are many features of the plan open to criticism. The central waiting space is insufficient, and the additional room provided in connection with the hall proper, is scarcely a satisfactory solution. The non-central position of the operating theatre and the placing of the consulting rooms too much in the rear, and the dressing-rooms and baths too far forward, all detract from the value of the plan. The whole scheme appears to us to err on the side of expensiveness. However, we must congratulate the authors on the elevations. These, conceived in a manner, which we would label, with some hesitation, "Tudor," show expert handling of the rules of composition.

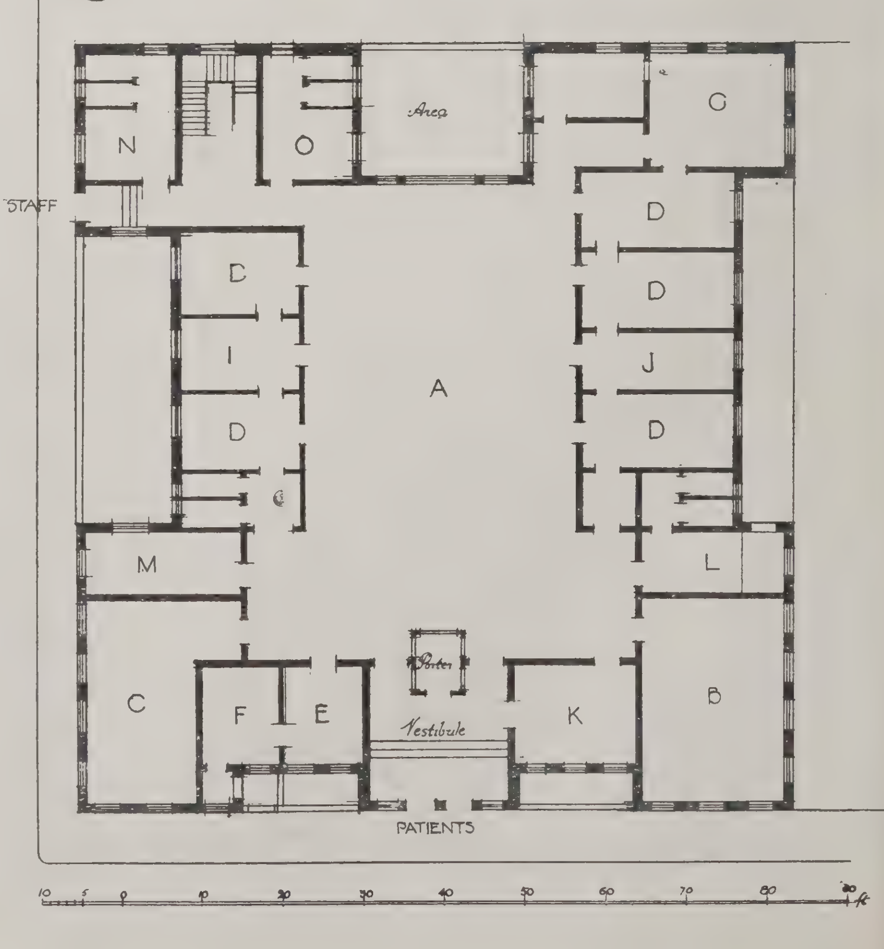
Messrs. Willink and Thicknesse's design again is comparatively extravagant, and the planning not strikingly happy. It will be noticed, for example, that the foot baths open off the main hall. But the design of the facades is distinguished by the use of simple forms in reasonable proportion.

The trustees appointed by the King for the erection of the Chapel of the Order of the Thistle have selected Mr. R. S. Lorimer, A.R.S.A., F.R.I.B.A., as architect for the design and execution of the work. Mr. Thomas Ross, F.S.A. (Scotland), will act as honorary consulting architect to the trustees.

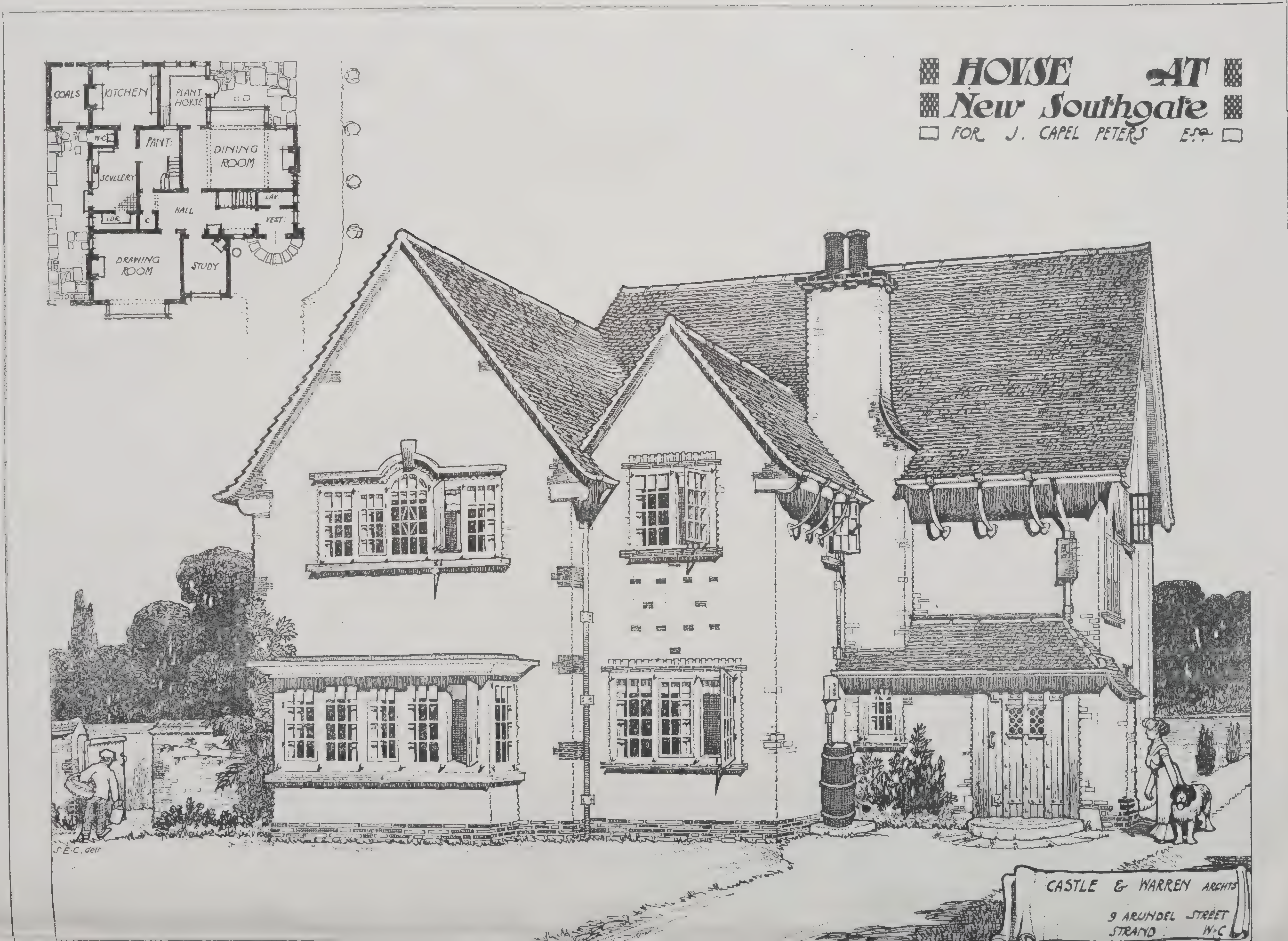
* * *

Mr. C. Harrison Townsend, F.R.I.B.A., has removed from 32, Great George Street, Westminster, S.W., to 32, Queen's Road, St. John's Wood, N.W. (Nearest station, Marlborough Road, Met. Rly.) Telephone: P.O., Hampstead, 3082.

③ MESSRS WILLINK & THICKNESSE

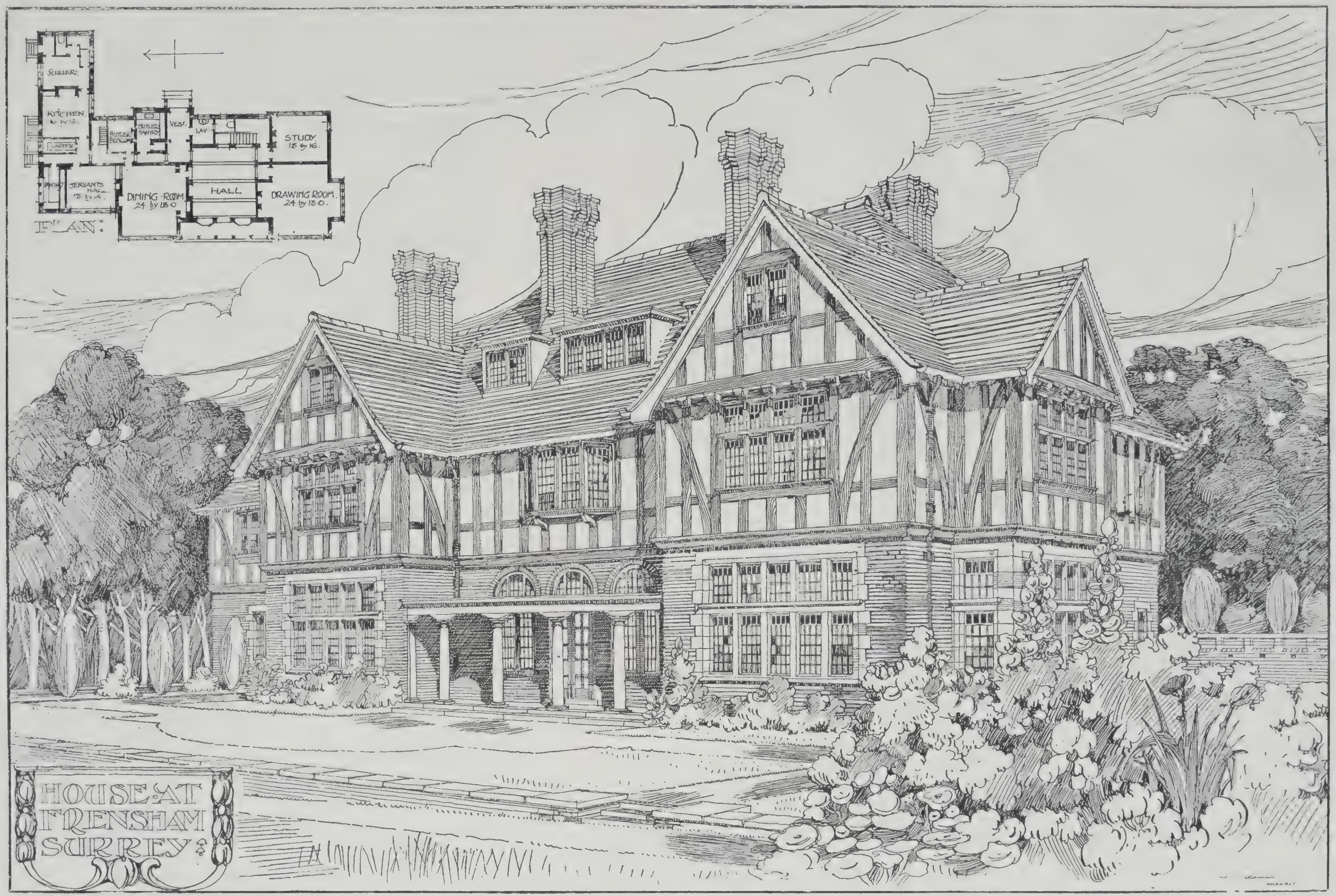


[illegible]
OF THE
UNIVERSITY OF ILLINOIS



HOUSE AT New Southgate
FOR J. CAPEL PETERS ESQ

CASTLE & WARREN ARCHTS
9 ARUNDEL STREET STRAND W.C



ARTHUR J. STEDMAN, ARCHITECT.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
April 30	WHITBY SECONDARY SCHOOL. Application for conditions (prepared in consultation with Mr. Paul Waterhouse, the Assessor) should be addressed, before April 30th, to the Secretary, Education Offices, County Hall, Northallerton. The Committee reserve the right to restrict the number of competitors.
May 1	RESIDENCE FOR ASSISTANT MEDICAL OFFICER, BRIGHTON WORKHOUSE. The Guardians invite competitive designs for the above from Architects practising and having offices in the Parish of Brighton. Conditions and site plan from B. Burfield, Clerk to the Guardians, Parochial Offices, Prince's Street, Brighton.
June 1	MOLESEY ISOLATION HOSPITAL. The East and West Molesey U.D. Council invite competitive plans, with specifications for the above. Full particulars can be seen at the Council Offices, Dundee Villa, East Molesey.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading. Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second, and third respectively. Assessor: Mervyn E. Macartney, F.R.I.B.A., F.S.A.
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31.	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	WALLASEY U.D. COUNCIL. CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

Reading County Offices Competition.

Members of the Institute proposing to enter for this competition are requested to communicate with the undersigned before taking any further steps in the matter.—Ian MacAlister, Secretary R.I.B.A.

Monument to Peter the Great at Riga.

A monument to Peter the Great is to be erected in Riga, and the Municipality invite competitive sketches from home and foreign architects. The authors of three selected sketches will be respectively awarded 1,500, 1,000 and 500 roubles (a rouble is equivalent to about 2s. 10d.). The competition closes on May 1st. Further information can be obtained from the Municipality of Riga.

Our Plate.

The house at New Southgate is to be erected in Bowes Road, and is externally faced with mottled brickwork, and the roof slopes, covered with old roofing tiles. The general motive has been to obtain a simple exterior with an avoidance of any "special" feature, and wide iron casements by Messrs. Humphries, Jackson, and Ambler, of Manchester, are introduced in broad frames with oak pins left projecting. The brickwork up to damp course is to be tarred, and the ironwork generally painted a soft apple green. The interiors are treated with like simplicity—the rafters and beams in the hall and dining room are left revealed and ceiled in between, and these rooms are panelled out in plain oak panelling. Mr. E. Parker, of 4, Bishopsgate Street, E.C., is the contractor, and the leaded glazing by Messrs. William Morris and Company, Westminster, S.W. Messrs. Castle and Warren are the architects.

The house now being erected at Frensham, Surrey, commands extensive and charming views of the surrounding scenery, especially on the west front. The bricks used are red (local hand-made). The roof is covered with a dark brown local tile, giving the appearance of old tiles. Bath stone dressings are used, with English oak half-timber framing and white stucco work. The hall and vestibule are panelled in oak, and the ceilings have oak beams and joists; the staircase and stairs are all in oak, being partially in view of the hall through arched openings. The dining room joinery is also in oak. The drawing-room has a panelled ingle nook and panelled dado, with a large bay window. The hall and corridors are heated by hot-water pipes and radiators carried out by Messrs. C. P. Kinnell and Co., the sanitary, plumbing and drainage work is by Messrs. Doulton and Co., and electric light is to be installed throughout by Messrs. Drake and Gorham. The general contractors are Messrs. Goddard and Sons, of Farnham, and the architect is Mr. Arthur J. Stedman, of Farnham, Surrey.

AN EXHIBITION OF COTTAGE DESIGNS.

An exhibition of cottage designs promoted by the Council of the Manchester Royal Institution will be opened in the Manchester City Art Gallery in June.

The promoters desire particularly to illustrate designs of workingmen's cottages which have already been erected, and of which reliable particulars as to cost and construction can be given, and they wish to discourage representation by picturesque drawings, and to rely rather on working drawings and photographs to show the designs.

The exhibition will be open for about nine weeks, and after about a month at the City Art Gallery, the drawings will be moved first to the Queen's Park, and secondly to the Ancoats Museum galleries.

While the promoters have in view the desirability of exhibition designs for cottages which shall give definite information as to the sort of cottage which may be reasonably within the reach of the working man in town or country, and shall not be misleading from mere cleverness of draughtsmanship, they are prepared to receive suggestive designs for laying out groups of cottages.

Mr. Percy Worthington is acting as hon. organising secretary to the Exhibition, and will be glad to receive applications for forms and particulars from those interested in the subject as landlords, architects, or builders. Forms and particulars may be obtained from him at his address, 46, Brown Street, Manchester.

Mr. S. Rings, M.S.A., has accepted the honorary appointment of architect to the German Protestant Church and Schools, Whitechapel, which was held by the late Mr. E. A. Gruning, F.R.I.B.A.

THE ROYAL AUTOMOBILE CLUB.

Our attention has been courteously called by Messrs. Mewès and Davis to the fact that from the article in our last issue it might be inferred that Mr. E. Keynes Purchase, F.R.I.B.A., of 20-22, Maddox Street, is only acting in an honorary capacity with regard to the Building of the Royal Automobile Club in Pall Mall, and that this is not the case. He and Messrs. Mewès and Davis have been appointed by the club to act as joint architects, and he is equally responsible with them for the whole scheme and the carrying of it into execution.

His name should have appeared at the foot of all the plans and sketches in our last issue with that of Messrs. Mewès and Davis as joint architects.

The continuation of the article dealing with the work of these architects will appear in our next issue.

TRADE BOARDS BILL.

Memorandum by the Employers' Parliamentary Council.

The Employers' Parliamentary Council have addressed the following memorandum on this Bill to Mr. Winston Churchill:—

This Bill, which is intended to establish wages boards for the fixing compulsorily of rates of wages which employers may legally pay, is objected to by the Employers' Parliamentary Council upon the following and other grounds:—

So far as the trades scheduled in the Bill are concerned, the value of the article of commerce produced by them is determined not altogether by the wages paid in production and the cost of the raw material, but by unrestricted competition. It may fairly be assumed that the average rate of profit in the so-called sweated trades is not materially higher than the average rate of profit in trade generally. If it were so, capital would be attracted into the "sweated" trades until the rate of profit reached the normal level. If, then, the profit earned by employers in these trades is not in excess of the profit earned by other employers, it would appear that there is no source from which an increase of wages can come except by the enhancement of the price of the product, which would lead to increased competition from manufacturers abroad who are not subject to the restrictions contemplated, and hence to the extinction of the trades in this country.

It is doubtful whether any scheme for the fixing of wages would be in practice enforceable; and in any case employers who did observe the minimum rate of wages would certainly not continue to employ persons who in their opinion were not worth the amount payable. They would therefore discharge a considerable number of the older and less competent workpeople, while a greater strain would be put upon those who remained, in their efforts to comply with the employer's requirements.

There is abundant evidence to show that the establishment of a minimum wage, even when its observance can be secured, does not increase the total amount paid in wages, but simply causes a reduction in the higher rates of wages, the more competent workmen having thus to pay for the increased wages of the less competent.

Apart from any question of the principle involved in the Bill, the provision is especially objected to by which the Board of Trade is to be empowered to set up a wages board for any trade whatever. With regard to the trades to which the Bill is to apply in the first instance, Parliament will decide for itself as to their inclusion or otherwise, and it is submitted that Parliament should in like manner decide on the inclusion of any other trades. It is admitted by the advocates of the Bill that the establishment of a minimum wage is a measure to be resorted to in very exceptional circumstances only, and it cannot be right that such a measure should be forced upon any industry without the deliberate decision of Parliament.

It is to be noted that many of the industries to which the Bill might be applied have already established voluntary agencies for the settlement of disputes, and it would certainly not conduce to the harmonious working of these industries if such voluntary arrangements could be overridden by the appointment of wages boards, possibly at the instigation of a small number of discontented persons.

Trade and Craft.

Some Serviceable Pumps.

Messrs. W. H. Wilcox and Co., whose offices are at 23, Southwark Street, London, S.E., have issued an illustrated list showing several of their pumps of various types. In the Willcox-Turner patent triple-acting plunger pump there are two independent pistons, which, operated by crank levers connected to a handle, work to and from each other as the handle is worked to and fro. When the handle is moved to the left, the pistons separate, thus delivering the water through the ports at both ends of the pump cylinder, and at the same time filling the space between the two pistons. When the handle is moved to the right, the water is discharged from between the pistons through the centre port, and the two end spaces are filled. Hence there is constant delivery through end and central ports. Two cup leathers are fixed back to back on each piston, and one of them is always forcing, thus ensuring perfect suction and delivery, while slip is reduced to a minimum. The pump being brass-lined, there is no sticking or scoring of leathers by rust. All parts can be renewed without skilled labour; and the sucking and delivering being in equal quantities, there is, besides increased capacity, an equal strain on all parts of the pump. This pump may be adopted not merely for hand use, but also for windmill and other mechanical power. Acting both for lifting and forcing, it will suck vertically 25 ft., and will force to about 100 ft. Where portability is required, the pumps are mounted on stands or barrows. The stand pumps are admirable for lifting out of ponds, trenches, shallow wells, etc., and the barrow pumps are in large demand for horticultural and estate use. The triple action power pump is shown in the list as of two patterns, the pillar pattern being mounted on a cast-iron column for direct belt driving, while the vertical plank pattern is for bolting to a wall or similar support. The patent triple-action twin-type plunger pump, for hand or power, consists of two Willcox-Turner pumps coupled together, with accurately-balanced link motion. This pattern is capable of delivering against a head of 120 ft. on slow speed, and is admirably adapted for irrigation work, where a considerable quantity of water is required to be delivered. Architects and contractors who are responsible for water supply and distribution, or any kind of pumping, will find this list very serviceable and suggestive.

Hawksley's Staircasing Specialities.

The Andrews-Hawksley Patent Tread and Engineering Company, Columbia Works, Prestins Road, Poplar, London, E., who are well-known as staircase experts, have issued a well-illustrated catalogue in which the latest improvements in their special lines are attractively and instructively set forth.

The Hawksley tread consists of a solid cast-iron frame, into which are hammered the best oak blocks on the cross of the grain. The blocks being fixed independently of each other, any that become worn can be struck out with a mallet and chisel, and new blocks substituted. The simplicity, durability, economy, and, above all, the entirely satisfactory efficiency of the system may be inferred from the fact that it has been adopted at most of the London railway stations. These treads give a firm and pleasant foothold, and are perfectly noiseless.

The patent reversible tread is a combination of wrought-iron round and flat bars, bolted through oak or pine blocks on the cross of the grain. Constant traffic fills in the grain of the wood with dust and grit, making the wearing surface as hard and as rough as concrete, and thus providing an absolutely safe foothold. But the chief advantage of this tread is that it is reversible; when one edge is worn, it can be reversed back to front, the hosing being unscrewed and brought to the front also. After both edges have been worn, the entire tread can be turned right over, and the same process repeated, so that the tread has four lives. These treads can be fitted to any existing staircase, landing, or step, old or new, and are specially adapted for worn stone or concrete steps.

Hawksley's Patent 1908 "Ideal" woodblock tread has a perfectly level surface that can be kept absolutely clean, and it is therefore particularly useful for hospitals, schools, etc.

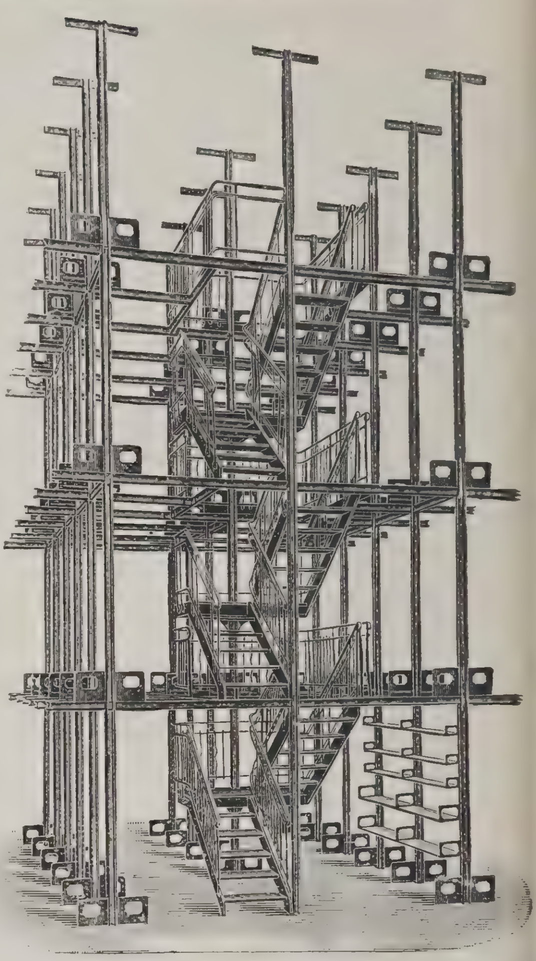
The catalogue shows also a rubber studded tread, rubber floor treads for many services, an iron fire-escape tread, and illustrations of the firm's iron staircases, grilles for lift enclosures, reversible coal-plates, and other interesting applications. The firm execute light constructional work in iron and steel for all purposes; and an interesting example of their staircasing work is now nearing completion at the St. James's Park Station of the Metropolitan District Railway.

A Space-Saving System of Library Construction, &c.

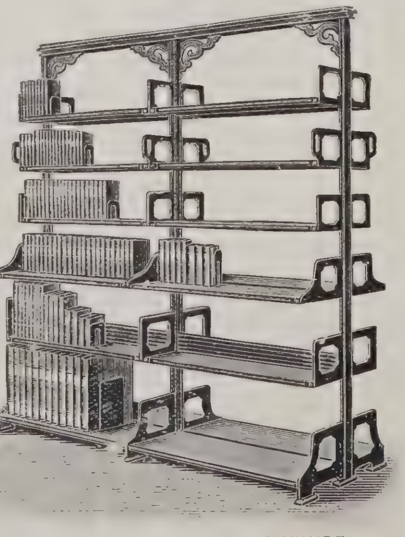
In last week's issue we noticed, on page 341, the new illustrated catalogue of the Adjustable Shelving and Metal Construction Co., Ltd., of Gwydir Chambers, 104, High Holborn, W.C., setting forth their patent system of internal construction for libraries, warehouses, etc., and describing their space-saving fittings for the storage of books and documents. In answer to enquiries, we now give additional particulars of this system.

Many adaptations of the system to various requirements have been made. The firm's patent book stacks, with adjustable shelving, are lightly but strongly built, and are so constructed that the shelves, even when fully loaded, can be adjusted to any desired height. These stacks may be entirely detached or self-supporting, so that they can be placed in the middle of the room or along the walls, like any article of furniture; or they may take the form of fixtures to the walls, or of suspended book-brackets, steel or wood cabinets, provided with doors or with shutters. Again, the firm supply adjustable fittings that can easily be applied to any existing book-case or cupboard.

The inter-flooring construction is a patent space-saving system that is used in conjunction with the general construction of the building. The uprights pass through the various storeys, and serve the dual purpose of racks for the shelving and stanchions for the intermediate floors. The floors may be constructed of hard wood, iron gratings, cement, glass, steel plates, or the firm's special system of corrugated sheets covered with cement. Such structures may be several storeys in height, but the floors need rarely be more than 2ins. in depth, as they do not take the weight of the loaded stacks, the whole weight being carried by the uprights. As none of the weight of the structure is taken by the walls, these need only be of minimum thickness; and, piers being unnecessary, the whole wall space is available for windows. Every possible inch of space is available for storage, as the uprights serve the purpose of racks for the shelving. It is stated that in the case of the Royal Library, Berlin, which is thirteen storeys high, this new system, with its 2in. floors, gained 7ins. in each storey as compared with the old method. Therefore in the thirteen storeys there was a total gain of 7ft. 7ins., or the height of another storey, thus affording accommodation for 350,000 more books—surely a most striking vindication of the claim that this is a space-saving system.



INTER-FLOORING CONSTRUCTION AND ADJUSTABLE SHELVING FOR LIBRARIES, ETC.



ADJUSTABLE SHELVING FIXTURE.

An essential feature of the system is that the book stacks are constructed with adjustable parts, which can be rearranged at will. By means of a kind of ratchet arrangement, the plates that form the sides of the shelves can be easily raised or lowered, and whole sections can be transferred without trouble from one stack to another.

Architects are advised to obtain the firm's catalogue, which fully explains and illustrates the system in its various adaptations and developments. We have here mentioned only its essential features, but the catalogue shows numerous modifications for a large variety of services. Among them are patent collapsible document stacks, with or without doors; patent stacks for stores and warehouses; cabinets for card index binders; cupboards for maps (to be sent up singly or in ranges); shelving for shop windows; show cases for shops and museums; and many other items of use and interest.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

CONCRETE AT OLYMPIA.

This year's Building Exhibition at Olympia has a very good show of exhibits connected with concrete. The great preponderance is in the exhibits of systems of reinforced concrete. The following is a classified list of the firm's represented :—

REINFORCED CONCRETE.

Row B24.—Patent Indented Steel Bar Co., Ltd.
Row B28.—James H. Tozer and Son, Ltd.
Row C41.—Armoured Tubular Flooring Co. Ltd.
Row C56.—Lewis Construction Co., Ltd.
Row E76.—Expanded Metal Co., Ltd.
Row E80.—Trussed Concrete Steel Co., Ltd.
Row F90.—United Kingdom Fireproofing Co., Ltd.
Row G115.—Sideolith.
Row H141.—D. G. Somerville and Co.
Row P239.—Edmond Coignet, Ltd.
Wall space 146.—Mark Fawcett and Co.
Gallery Row B21.—Empire Stone Co., Ltd.

REINFORCED BRICKWORK.

Row D64.—Kleine Patent Fire-resisting Flooring Syndicate, Ltd.
Row Q253.—Fireproof Partition and Spandrel Wall Co.
Row R258.—Richard Johnson, Clapham, and Morris.

PORTLAND CEMENT MANUFACTURERS.

Row D63.—Associated Portland Cement Manufacturers (1900), Ltd.
Row K187.—Saxon Portland Cement Co., Ltd.
Gallery Bay 9a.—Wouldham Cement Co., Ltd.

CONCRETE MIXERS.

Wall Space 145 and Gallery Bay 26a.—Ransome-ver Mehr Machinery Co.
Gallery Row B36.—Stothert and Pitt, Ltd.
Gallery Row B2.—Sam Deards.

REINFORCING STEEL BENDING MACHINES.

Row O228.—John Barker and Co., Ltd.

CONCRETE BLOCKMAKING MACHINES.

Wall Space 158.—Matthew Wylie.
Gallery Row B2.—Sam Deards.

ARTIFICIAL STONE, CONCRETE PAVING, COPINGS, ETC.

Gallery Row B21.—Empire Stone Co., Ltd.
Gallery Row B37.—Ceriog Granite Co., Ltd.

CONCRETE SLAB PARTITIONS.

Row G128.—Acton Patent Concrete Partition Co. (1909), Ltd.
Row H132.—Horace W. Cullum and Co.

CONCRETE ROOFING TILES.

Row B35.—Sharp, Jones, and Co.

COVERINGS TO FLAT ROOFS.

Row C42.—Vulcanite, Ltd.
Row C44.—F. McNeill and Co.
Row F101.—Ruberoid Co., Ltd.
Row R259.—Robert W. Blackwell and Co., Ltd.
Gallery Bay 16.—George M. Callender and Co., Ltd.

From the above it will be gathered that this group of firms form one of the most important sections of the exhibition. The stands, taken as a whole, are well arranged to display the distinctive features of each exhibit, and in many cases are large and imposing structures.

In the reinforced concrete sub-section, though we note the absence of a few prominent names, we find the industry thoroughly well represented, and more completely so than any other important section of the building trade. Beyond these exhibits there are very few different systems of reinforced concrete used in this country, so that those architects, engineers, and others who visit the exhibition with the object of gaining some knowledge of up-to-date building methods can feel assured that if they have carefully investigated the claims of the firms exhibiting who are recorded in the above list under reinforced concrete and reinforced brickwork, they will have mastered the subject which is the greatest advance in building construction there has been for 400 years. The importance of the subject can hardly be grasped; it will only be possible to gain a clear idea of it when we look back after a decade or two; for the moment we are too close to gain perspective—we are in the Concrete Age, and we hardly grasp the purport of it all.

Broadly speaking, there are three subdivisions of the reinforced concrete exhibits which we may call—(1) systems of construction employing ordinary commercial sections of steel; (2) special forms of reinforcement; (3) special methods of construction, or means of executing work.

Belonging to the first sub-division solely we have only the Coignet system, in which the reinforcement is arranged in various ways to resist the stresses in structural members, and to meet various conditions. Belonging to divisions 1, 2, and 3 is the Armoured Tubular floor, consisting of ribs with tubes filled between (both shop-moulded) and a filling of concrete thereon done *in situ*, thus doing away with centring; the ribs are reinforced with a special section of corrugated bar with projections thereon to give mechanical bond. To divisions 1 and 3 belong two other systems in which tubes are filled between shop-moulded ribs to economise centring; but in which ordinary commercial sections of steel are employed, viz., The United Kingdom Fireproofing Co.'s and D. G. Somerville and Co.'s. Both these firms also execute floors completely constructed *in situ*, in which ordinary sections of steel are arranged in the manner of early constructors. In division 2 we place the Expanded Metal Co. (who supply a sheet reinforcement formed by slitting or shearing sheet steel, and opening it into a diamond-shaped mesh called "Expanded Metal"), James H. Tozer and Son, Ltd. (who supply a sheet reinforcement of woven-drawn steel wire called "Lock Woven Mesh"), the Patent Indented Steel Bar Co., Ltd. (who supply bars rolled with indentations thereon, and made from high carbon steel, having a higher elastic limit and ultimate strength than ordinary mild steel bars, in place of which the "Indented Bars" are intended to be used), the Trussed Concrete Steel Co., Ltd. (who supply mild steel bars of special section, having flanges an either side of a square, these flanges being cut and turned up at points to form prongs to serve to reinforce structural members against diagonal tensile stresses), Sideolith (who supply special mild steel sections expanded or opened out to form "Skeletons" consisting of main upper and lower members united by diagonal ties, the latter serving to reinforce against diagonal tension), and Mark Fawcett and Co. (who supply rolled steel joists of special section, *i.e.*, with top flanges smaller than the bottom ones, with holes punched out of the webs, leaving diagonal members intended also to resist diagonal tension). In division 3 we place the Lewis Construction Co., Ltd. (who employ their "Dovetail Corrugated Sheeting" as a permanent centring instead of boards, framing up the reinforcements therein, so that the whole forms a complete unit, economising labour, and obviating displacement in filling in the concrete), and the Empire Stone Co., Ltd. (who place concrete around a number of metal cores with rods attached thereto, and then cut the concrete slab up while soft by a special saw to form beams, from which the cores are afterwards withdrawn, when they can be laid side by side to form a hollow floor without any centring being needed; the process was invented by M. Seigwart, and is known by his name). These firms arrange their reinforcements in various ways, and employ various means, and generally it may be said that all fulfil structural requirements and provide efficient constructions. In their differences lie the reasons for them all meeting with approval, for they suit many conditions, and in certain circumstances one or other may provide the best solution of the problem. As regards reinforced brickwork, the Kleine system applies to floor construction, and consists of hollow brick blocks laid in cement mortar between steel beams, with steel flats embedded in the mortar between the joints; generally a filling of concrete is employed to provide extra compressive resistance. The other firms, *i.e.*, the Fireproof Partition and Spandrel Wall Co. and Richard Johnson, Clapham and Morris, are exploiting an idea which, though not exactly novel, has only within the last few years been recognised as possessing great advantages in the way of strength and economy of material and cost and saving of weight. Both firms employ steel reinforcements laid in the joints of the brickwork, so as to give it continuity of action, and render it practically homogeneous and capable of sustaining great loads as a beam.

The Portland cement manufacturers exhibiting all employ the most up-to-date processes of manufacture, and their cement is of the utmost reliability, and the finest quality. Modern cement is vastly superior to that obtainable up to only a few years ago, due to finer grinding, better chemical supervision and proportioning, and better burning. The concrete mixers exhibited are known as the "Ransome," the "Smith," and the "Smales." The two former belong to the batch type, the first-named having a drum which only rotates, while the latter has a cone-shaped drum, which both rotates and can be turned over to discharge its contents. The "Smales" is a continuous mixer, having blades working in an open trough. The economy and superior quality of the concrete obtained by the use of mixers is considerable.

The reinforcing steel bending machine is known as the "Kennedy," and is now used by a number of contractors for fashioning steel sections of various shapes. It is a very efficient and economical machine, and is worked by hand labour. There are only two concrete blockmaking machines exhibited, and in this respect the exhibition is deficient. The "Smales" (Sam Deards) machine is a very good one, with a large output. It makes solid blocks with which cavity walls are erected. The "Ideal" machine (Wyllie) has been largely used, and has proved that concrete blocks made in such machines provide good, strong, and weather-resisting walls that are economical, and often much cheaper than brickwork of the ordinary pattern. The artificial stone and paving exhibits provide nothing exactly new or novel, nor do the concrete slab partitions. The latter are now much used, and are cheap and highly fire-resisting. Messrs. Sharp, Jones and Co. exhibit some concrete roofing tiles of a novel form, and show another direction in which concrete can be employed to advantage and to displace materials that have long held the field for such purposes. In respect to concrete roofs and tanks the exhibits of covering materials are interesting. They all consist of sheet fabrics impregnated with waterproofing materials. They form elastic coverings that are unaffected by small cracks developing in the concrete underneath and they have considerable powers of resistance. They form an economical and satisfactory solution to the problem of waterproofing concrete.

REINFORCED CONCRETE SYSTEMS.

The Considere System.

(Concluded from Page 284, No. 738).

In the first part of this article we described and illustrated the construction of Considère piles. We now supplement the particulars there given by a view (Fig. 3) of a group of piles after driving at a chocolate factory built on the Considère system at Noisiel. The average length was 37ft., all being octagonal, of 14ins. diameter across flats. A 2-ton monkey, with a drop of 7ft., was used for driving, the monkey falling direct on to the head of the pile, no dolly or elastic cap or cushion of any kind being employed. over 500 of these spirally reinforced piles were employed in the foundations of this job for the Menier Chocolate Co.

The columns of the main building of the above factory are each 2ft. 3ins. square, and each support a load of about 700 tons.

Fig. 4 shows bowstring and arched bridges erected over the railway and river Sée at Avranches, France. The former is of 100ft. span, and the arch of 110ft. span, the total length being 281ft. The bowstring and the arch are both reinforced with rods arranged in spiral manner.

A Considère bridge has been erected over the Cambridge main line of the Great Eastern Railway at Angel Road Station, Tottenham. The viaduct has a total length of about 725ft., and comprises 17 spans of 42ft. 9ins. each. The width between parapets is 40ft. Figs. 5 and 6 show completed sections of the work.

A jetty head 136ft. long by 32ft. wide in 45ft. of water has been constructed on the Considère system at Thames Haven for the London and Thames Haven Oil Wharves, Ltd.. It stands on piles reinforced as before described, and has cross braces also spirally reinforced. We shall describe and illustrate this work in a separate article in a future issue.

The Considère system has only been on the English market about two years, but it has made considerable progress in that time as is shown by the following list of contracts executed or in hand:—

RECONSTRUCTION OF JETTY HEAD AT THAMES HAVEN, for London and Thames Haven Oil Wharves, Ltd. Jetty head is 136ft. long by 32ft. wide. The deck level is about 45ft. to 48ft. from the bed of the river. Vessels up to seven or eight thousand tons burthen are accommodated. Work completed. Engineer, A. E. Carey, M.I.C.E. ANGEL ROAD STATION BRIDGE for G.E. Railway. Bridge over main line to Cambridge, comprising 17 spans of 42ft. 9in. each, with approaches, etc. Work approaching completion. Engineer, John Wilson, M.I.C.E. ABERDEEN HARBOUR EXTENSIONS for Harbour Commissioners. New quays, 3,300 lin. ft. frontage. Piles now being made. Engineer, R. Gordon Nicol, M.I.C.E. ACKERGILL (N.B.).—Slipway for Royal National Lifeboat Institution, consisting of column supporting keelway and platforms. Work not yet commenced. Engineer, W. T. Douglas, M.I.C.E. COWDENHEATH (SCOTLAND). — Piled foundations, columns, and floors for shop and dwelling house. OBAN (SCOTLAND).—Repairs to pier. CARNARVON.—Low water landing stage for Carnarvon and Anglesey ferry.

Avrances Viaduct, Coutances Viaduct, Bergerac footbridge, Paillon River bridge, Perigueux footbridge, bridge over the River Aron at Cercy-la-Tour, bridge over the River Oued Hammam, Tunis. Vic-sur-Aiene bridge, bridge over the line from Busigny to Somain (Chemin de fer du Nord), bridge over River Oued Khol, Tunis, bridge over the River Oued Mellique, Tunis, bridge over the line from Paris to Soissons (Chemin de fer du Nord), seven bridges over the line from Paris to Chartres (Chemin de fer de l'Etat), five bridges over the lines from Paris to Bondy and Noisy-le-sec (Chemin de fer de l'Est), bridge over River Oued Bou-Zenna, Tunis, bridge over River Oued, Hammam, Tunis; bridge over River Oued, Krelef, Tunis, bridge over River Oued, Maden, Tunis, two bridges and a footbridge at Cairo, for the Societe des Oasis, Egypt, bridge at St. Jean la Riviere, bridge over No. 1 Valley de Cougne, bridge over No. 2 Valley du Cougne, bridge over the Valley of Ribas, Meiner chocolate factory, and Boulogne Port works.

The Selfridge Stores.

We regret owing to great pressure on our space that we have been obliged to hold over the concluding article on this building. This will appear in our next "Concrete and Steel" Supplement.

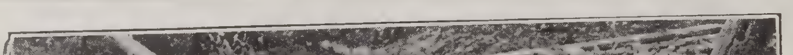


FIG. 3. GROUP OF CONSIDERE PILES, WITH OUTER SHELL REMOVED TO SHOW SPIRAL REINFORCEMENT.

THE DANGERS OF BREEZE CONCRETE.

By **D. B. BUTLER**, Asoc.M Inst.C.E., F.C.S.

Summary of paper read before the Society of Architects, on April 22nd.

During the past few years the author has met with increasingly numerous instances of failure of concrete composed of Portland cement and breeze, failures as a general rule caused by the expansion of the mass, resulting in more or less serious consequences to the structure of which it formed part. These failures have generally occurred where the concrete has been used to form flat roots or fireproof concrete floors, on the well-known embedded rolled joist system of construction; in some instances the expansion has been but slight, though noticeable; in others it has been sufficient to push out the brickwork walls, causing serious bulging and thus endangering the safety of the whole structure; while in one extreme case a flat roof composed of breeze concrete, not only expanded sufficiently to push out the parapet walls and seriously endanger the stability of the structure, but the internal disruption set up within the mass was sufficient, owing to incipient disintegration, to cause it to become buckled and distorted and thoroughly rotten.

Careful investigation of some of the foregoing cases of failure justified the opinion that the mischief lay with the cement, but in many instances the most careful and searching investigation, both chemical and physical, disclosed nothing sufficiently definite in character to enable the investigator to lay his finger with positive certainty on the cause of the trouble. In nearly all the samples of so-called "Breeze" concrete a very considerable quantity of material other than pure coke was noticeable in the aggregate, such as clinkers, stones, shale, ashes, etc., together with, in some instances, a noticeable amount of coal. It may be remarked in passing, that judging from the quality of the "Breeze" which may daily be seen being delivered to buildings in the course of erection, presumably for incorporation in fireproof floors, etc., many a clerk of works must be imbued with a pleasing and childlike faith in the ability of Portland cement to stick together any kind of rubbish; it appears to be an established belief with some users that to produce a good concrete, it is only necessary to have good cement, and that any dustbin refuse or other rubbish will serve for aggregate, and it is not until failure occurs that they realize that they have been asking and expecting the cementing medium to perform impossibilities.

It is questionable whether on account of its combustible nature, pure breeze, i.e., fine coke. is desirable as a fireproof material; an instance has recently been brought to the author's notice in which a breeze concrete enthusiast used that material for a boiler setting, which eventually took fire and gradually smouldered away, with results that can be better imagined than described. Whatever may be the disadvantages of other extraneous material found in breeze, it will be readily understood that coal is not a desirable constituent for concrete; in the first place on account of its smooth shiny surface, the adherence of the cement would be extremely poor; in the second place, it is worse than useless as a fireproof material, on account of its tendency to decompose on heating. The question arose, however, whether apart from being undesirable for the reasons aforesaid, either coke breeze or coal was in any way dangerous as being likely to cause expansion of the concrete.

The first experiment was of a somewhat rough and ready nature and was made with coal. An ordinary bituminous house coal was crushed and sifted to about the fineness of standard sand, i.e., passed through a 1-20in. sieve and retained on a 1-30in.; with this coal a 3-1 mortar was made, and two small 2oz. glass bottles filled with the mixture; one bottle was filled quite full, and the other was filled to within a quarter of an inch of

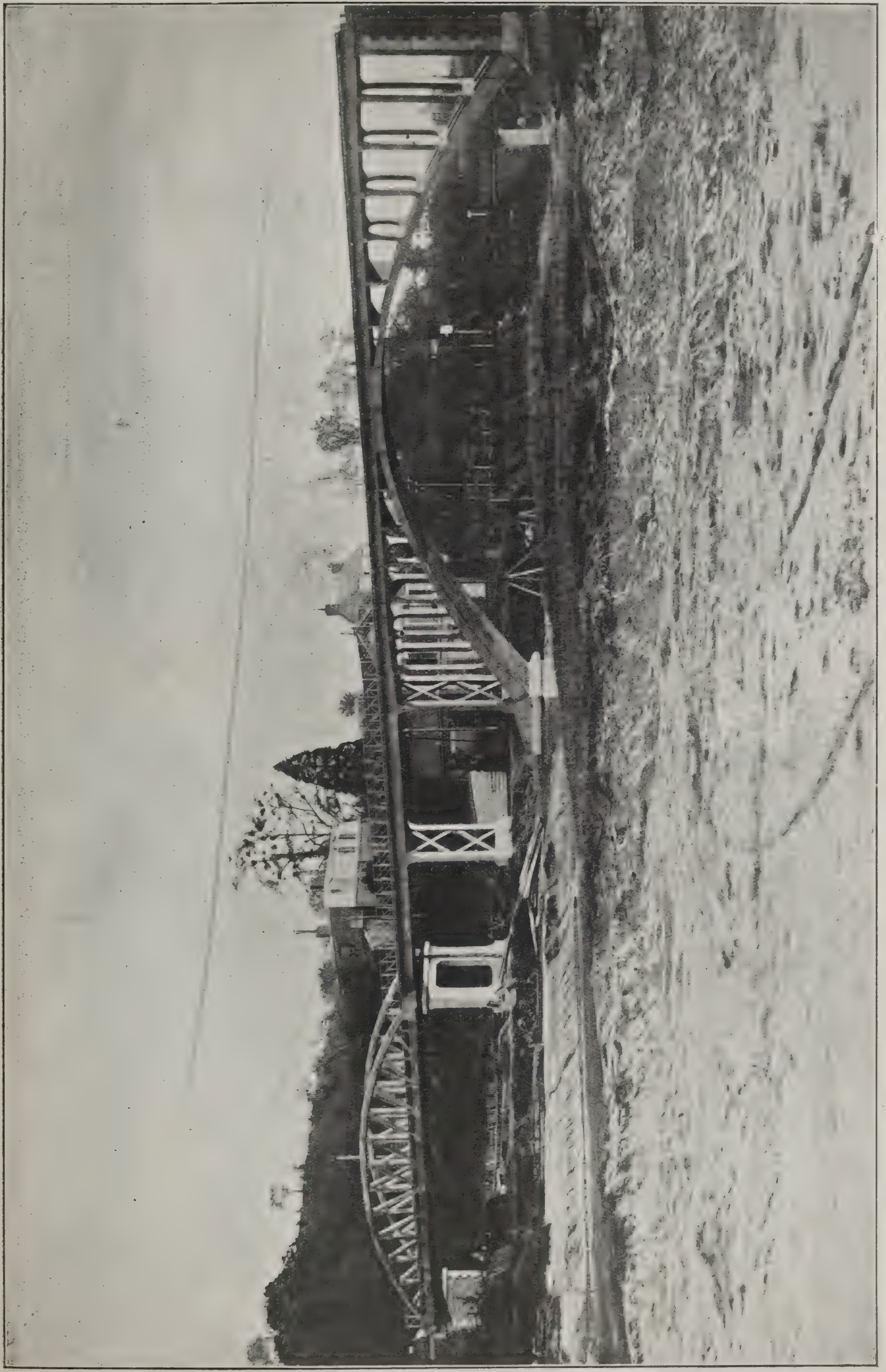


FIG. 4. RAILWAY BRIDGE OVER THE RIVER SEE AT AVRANCHES, FRANCE.
CONSTRUCTED OF REINFORCED CONCRETE ON THE CONSIDERE SYSTEM.

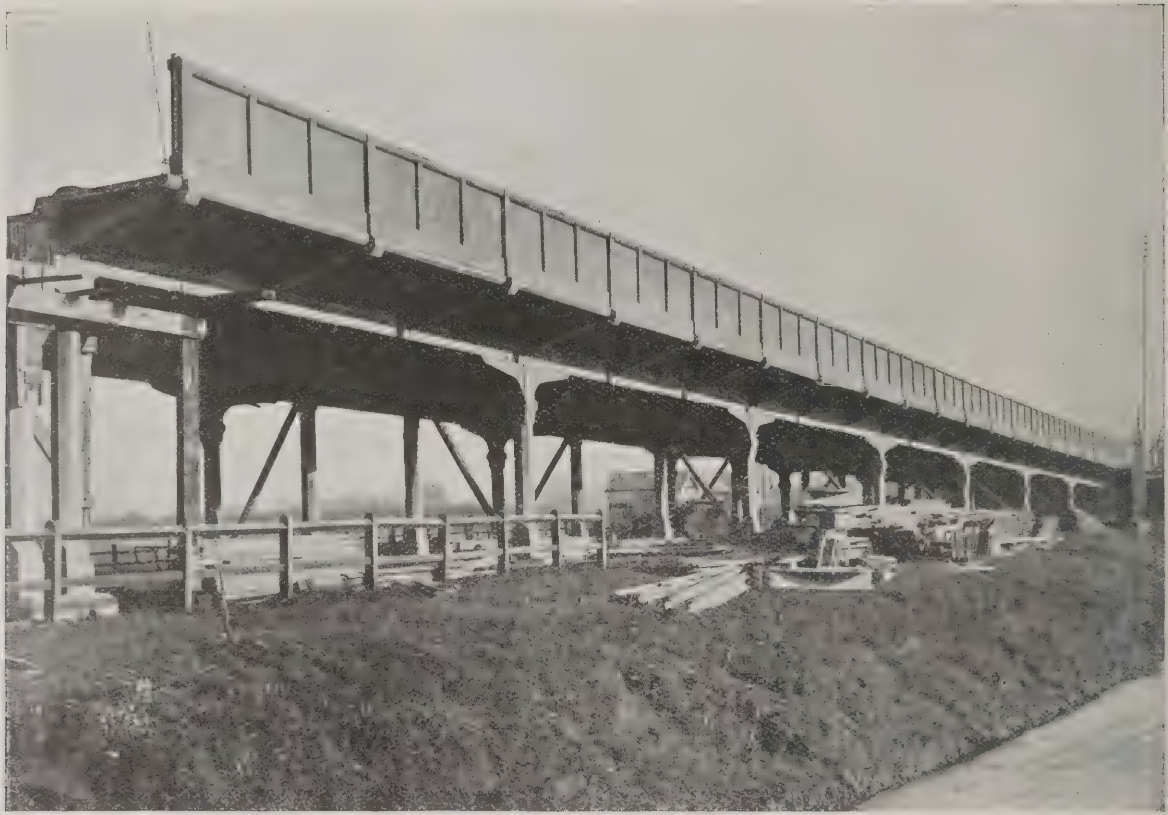
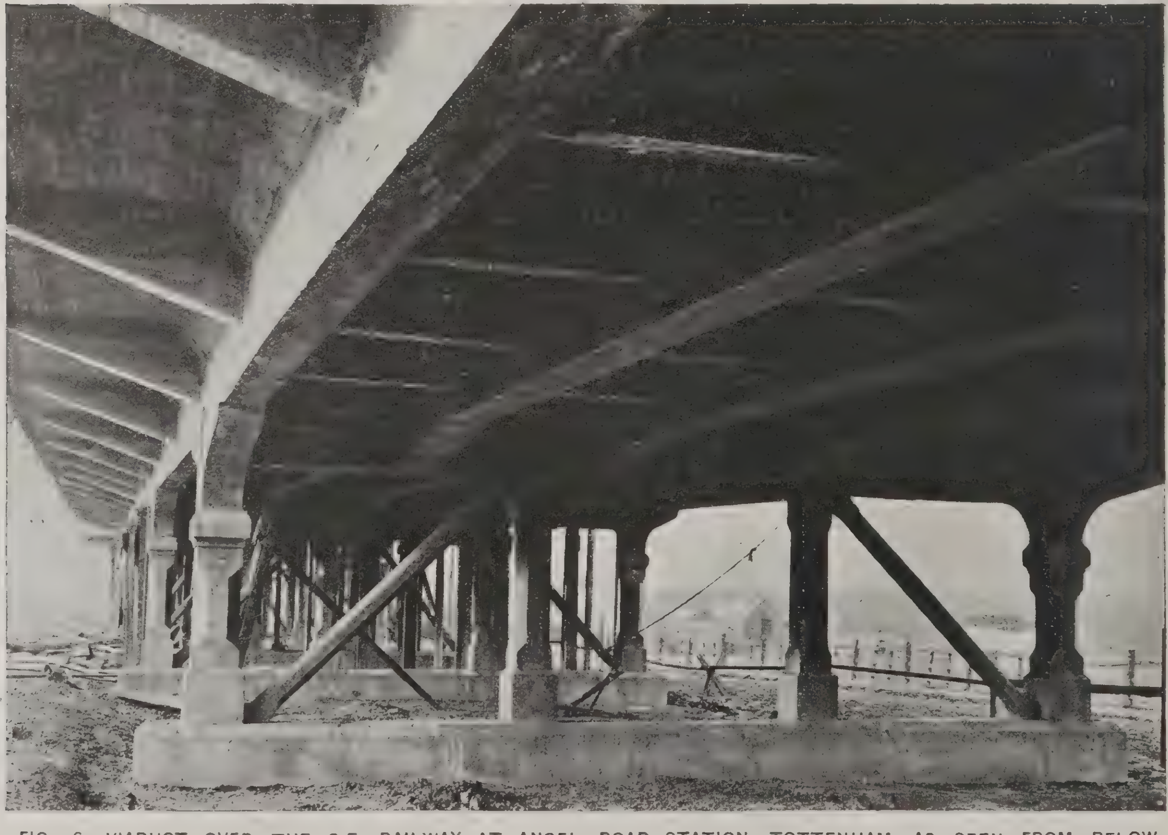


FIG. 5. VIADUCT OVER THE G.E. RAILWAY AT ANGEL ROAD STATION, TOTTENHAM, CONSTRUCTED OF REINFORCED CONCRETE ON THE CONSIDERE SYSTEM.



FIG, 6. VIADUCT OVER THE G.E. RAILWAY AT ANGEL ROAD STATION, TOTTENHAM. AS SEEN FROM BELOW.

the top and sealed down with a paste of neat cement, the object of the sealing being to ascertain whether the imprisonment of any hydrocarbons set free from the coal would have any bursting effect. For comparative purposes a similar bottle was also filled with a paste of neat cement and 3-1 mortar of standard sand. Sixteen cements of various qualities and different origin were tried, some being sound when tested for expansion by the Faija test and the Le Chatelier Boiling Test, and some otherwise; the samples were those which passed through the author's hands for testing in the usual course, and were not specially chosen except for the purpose of obtaining as varied a selection as possible. English, German, Belgian, and Swedish cements were represented.

The whole of the bottles eventually cracked, with the exception of the one filled with standard sand-cement mortar. But while those filled with the Coal Mortar generally cracked within two or three days, and with a very few exceptions continued to expand until the bottles burst away into several pieces, those filled with the neat cement and the sand mortar frequently did not develop any cracks whatever till several months, and it was the exception rather than the rule for them to continue expanding sufficiently to burst the bottle. It was observed in one test that both the neat cement and sand cement mortar bottles remained perfectly sound after eleven months, and then only developed very minute cracks, whereas the coal-mortar bottle was cracked in twelve days, and burst right off in forty-two days. This suggests that the cause of the cracking after such protracted periods might be due to unequal expansion of the glass and the mortars at varying temperatures; according to Ganot's Physics the co-efficient of linear expansion between 1 degree and 100 degrees C of glass is 0.000008613, and wrought iron (which is said to be the same as cement) is 0.000012204 or nearly 50 per cent. higher. Though as before stated the bottle test is only a rough one, it serves to show that coal developes dangerously expansive properties when mixed with cement, but since there is no clearly marked difference between those bottles sealed down with neat cement and those unsealed, it does not favour the theory that the expansion is in any way due to the evolution of gas within the mortar.

The next step was to test samples of so-called "Breeze" of various origin, to ascertain if the coal sometimes present (probably partially burned) was unsafe, and also if there were other constituents present which might prove detrimental. Several samples of good breeze were procured; also some which the author was assured by the breeze merchant would never be sanctioned by a good clerk of works; the constituents of the latter, however, did not differ materially from the ingredients to be found in breeze concrete from many important constructive works.

With all the samples tested the general method was to separate them into their several fractions or constituents, so as to be

APPENDIX II.

Neat and Standard Sand Mortar Bars.

Cement Sample.	Bar.	Le Chatelier Test for Soundness.	PERCENTAGE EXPANSION OR CONTRACTION.							
			Air Bars.				Water Bars.			
			1 day	7 days.	28 days.	3 months	1 day.	7 days.	28 days.	3 months
A	Neat.	Sample expanded 2 mm.	— ·145*	— ·315	— ·412	— ·498	+ ·045*	+ ·090	+ ·133	+ ·171
B	„	Sample expanded 3 mm.	— ·027	— ·090	— ·130	— ·173	+ ·002	+ ·032	+ ·045	+ ·034
A	3–1 Sand	....	— ·022*	— ·042	— ·065	— ·098	+ ·040*	+ ·052	+ ·050	+ ·044
B	„	....	— ·010	— ·025	— ·045	— ·053	— ·010	·000	— ·005	— ·018

+ Indicates Expansion. — Indicates Contraction * = 2-day Measurements.

APPENDIX III.

Breeze Sample No. 1 (Fine Pan Breeze).

Fraction.	Percentage of original sample.	Fineness after Crushing to pass 1/20″ sieve.			Cement Sample used.	PERCENTAGE EXPANSION OR CONTRACTION.							
		Residue per cent. on following sieves.				Air Bars.				Water Bars.			
		1/100″	1/76″	1/50″		1 day.	7 days.	28 days.	3 months	1 day.	7 days.	28 days.	3 months
Average ...	—	—	—	—	A	·000*	— ·045	— ·072	— ·088	+ ·070*	+ ·115	+ ·118	+ ·114
					B	·000	— ·035	— ·060	— ·077	+ ·105	+ ·117	+ ·128	+ ·113
Thro' 1/16″ sieve	31·95	66·5	54	44	A	+ ·007	— ·042	— ·060	— ·078	+ ·047*	+ ·053	+ ·042	+ ·043
					B	+ ·002	— ·044	— ·067	— ·080	+ ·072	+ ·035	+ ·027	+ ·018
Thro' ¼″ sieve	35·60	56·0	49	40	A	+ ·010	— ·029	— ·055	— ·069	+ ·037	+ ·045	+ ·027	+ ·031
					B	+ ·027	— ·037	— ·067	— ·082	+ ·020	+ ·022	+ ·010	+ ·009
Coke ...	10·51	56·0	47·5	37	A	+ ·005	— ·038	— ·067	— ·093	+ ·019	+ ·019	+ ·010	+ ·014
					B	— ·015	— ·053	— ·075	— ·093		Insufficient.		
Clinker ...	21·86	64·0	55·0	47·5	A	+ ·020	— ·027	— ·048	— ·072	+ ·032	+ ·029	+ ·022	+ ·019
					B	+ ·005	— ·029	— ·051	— ·068	+ ·040	+ ·039	+ ·035	+ ·024
Coal	·08	—	—	—			Insufficient.				Insufficient.		

+ Indicates Expansion. — Indicates Contraction * = 2-day Measurements.

APPENDIX IV.

Breeze Sample No. II. (Coarse Pan Breeze).

Fractions.	Percentage of original sample.	Fineness after crushing to pass 1/20″ sieve.			Cement Sample used.	PERCENTAGE EXPANSION OR CONTRACTION.							
		Residue per cent. on following sieves.				Air Bars.				Water Bars.			
		1/100″	1/76″	1/50″		1 day.	7 days.	28 days.	3 months.	1 day.	7 days.	28 days.	3 months.
Average ...	—	—	—	—	A	— ·022*	— ·049	— ·074	— ·097	+ ·013*	+ ·012	+ ·001	— ·006
					B	— ·005	— ·051	— ·074	— ·098	— ·013	— ·004	— ·011	— ·014
Coke ...	64·5	55	47·0	35	A	— ·002	— ·038	— ·071	— ·085	+ ·022	+ ·030	+ ·027	+ ·019
					B	— ·005	— ·056	— ·082	— ·100	— ·002	+ ·001	— ·002	— ·010
Clinker ...	35·5	64	56·5	46	A	— ·013*	— ·040	— ·079	— ·102	+ ·010*	+ ·009	·000	— ·006
					B	— ·008*	— ·042	— ·076	— ·101	+ ·012*	+ ·004	— ·002	— ·006

+ Indicates Expansion, — Indicates Contraction. * = 2-day Measurements.

APPENDIX V. Breeze Sample No. III. (Coke Breeze.)

Fractions.	Percentage of original sample.	Fineness after crushing to pass 1/20" sieve. Residue per cent. on following sieves.			Cement Sample used.	Percentage Expansion or Contraction. Air Bars.				Water Bars.			
		1/100"	1/78"	1/50"		1 day.	7 days.	28 days.	3 months.	1 day.	7 days.	28 days	3 months.
Average ..	—	—	—	—	A	+ ·019	— ·070	— ·100	— ·112	+ ·039	+ ·061	+ ·050	+ ·050
					B	+ ·001	— ·085	— ·122	— ·145	+ ·032	+ ·053	+ ·038	+ ·047
Thro' ¼" sieve	48·12	62	54	45	A	+ ·016	— ·056	— ·111	— ·134	+ ·040	+ ·073	+ ·063	+ ·060
					B	+ ·008	— ·069	— ·121	— ·124	+ ·028	+ ·046	+ ·036	+ ·033
Coal ..	2·64	64	58	48	A		Insufficient.				Insufficient.		
					B	+ ·011	— ·080	— ·131	— ·159		Insufficient.		
Coke ..	40·60	67	60	51	A	+ ·006	— ·046	— ·103	— ·126	+ ·069	+ ·084	+ ·046	+ ·070
					B	— ·003	— ·053	— ·090	— ·109	+ ·052*	+ ·045	+ ·036	+ ·036
Clinkers ..	8·64	69	63	53	A	+ ·036	— ·017	— ·060	— ·094		Insufficient.		
					B	— ·003	— ·069	— ·101	— ·128	+ ·033	+ ·050	+ ·051	+ ·058

+ Indicates Expansion. — Indicates Contraction. * = 2-day Measurements.

APPENDIX VI. Breeze Sample No. IV. (Furnace Ashes.)

Fractions.	Percentage of original sample.	Fineness after crushing to pass 1/20" sieve. Residue per cent. on following sieves.			Cement Sample used.	Percentage Expansion or Contraction. Air Bars.				Water Bars.			
		1/100"	1/78"	1/50"		1 day.	7 days.	28 days.	3 months.	1 day.	7 days.	28 days.	3 months.
Average ..	—	—	—	—	A	+ ·056	+ ·012	— ·028	— ·050	+ ·101	+ ·125	+ ·120	+ ·100
					B	+ ·021	— ·022	— ·053	— ·075	+ ·074	+ ·067	+ ·050	+ ·050
Thro' 1/16" sieve	25·80	70	64	54	A	+ ·021	— ·026	— ·062	— ·091	+ ·090	+ ·128	+ ·136	+ ·118
					B	+ ·022	— ·016	— ·062	— ·084	+ ·047	+ ·064	+ ·056	+ ·048
Thro' ¼" sieve	22·02	60	53	44	A	+ ·019	— ·027	— ·058	— ·075	+ ·129*	+ ·111	+ ·120	+ ·118
					B	+ ·009	— ·037	— ·060	— ·072	+ ·042*	+ ·041	+ ·037	+ ·028
Coke ..	14·93	50	44	36	A	+ ·021	— ·031	— ·082	— ·109	+ ·090	+ ·108	+ ·086	+ ·076
					B	+ ·014	— ·036	— ·079	— ·109	+ ·040	+ ·046	+ ·038	+ ·034
Clinkers ..	35·84	68	62	53	A	+ ·065	— ·009	— ·069	— ·101	+ ·012	+ ·008	— ·004	— ·003
					B	— ·003	— ·026	— ·064	— ·089	+ ·002	— ·029	— ·002	— ·021
Coal ..	1·41	—	—	—	—		Insufficient.				Insufficient.		

+ Indicates Expansion. — Indicates Contraction. * = 2-day Measurements.

APPENDIX VII. Breeze Sample No. V. (Gas Works Clinkers).

Fractions.	Percentage of original sample.	Fineness after crushing to pass 1/20" sieve. Residue per cent. on following sieves.			Cement Sample used.	Percentage Expansion or Contraction. Air Bars.				Water Bars.			
		1/100"	1/78"	1/50"		1 day.	7 days.	28 days.	3 months.	1 day.	7 days.	28 days.	3 months.
Clinkers (only)	100·00	65	58	48	A	— ·014*	— ·051	— ·079	— ·109	+ ·010*	+ ·007	+ ·005	— ·006
					B	— ·019*	— ·061	— ·094	— ·109	+ ·007*	·000	— ·004	— ·013

+ Indicates Expansion. — Indicates Contraction. * = 2-day Measurements.

able to identify, if possible, the cause of the expansion, if any. Each sample was therefore carefully separated out as follows:

(1) The fine material passing through a 1-10in. sieve.

(2) The fine material passing through a ¼in. sieve, but retained on a 1-10in. sieve.

(3) The coarse material retained on a ¼in. sieve; this was picked over by hand and separated out into its various constituents, such as clinkers, coal, coke, etc.

An "average" sample was also prepared, being (1), (2), and (3), mixed together in their proper proportions.

The variety of materials in some of the samples of so-called "breeze" was considerable, and in addition to coal, coke, and clinkers, rubbish of all sorts was present, such as bits of steel saw, nails, brass, and iron turnings, and other metal fragments, broken pottery, etc., etc., in fact, savouring rather of the rubbish usually found in the dust bin, than of coke breeze proper. The percentage of each fraction was carefully recorded, as will be noted in the tables given in the appendices, and as a convenient size for making into mortar for testing purposes, each fraction was broken up to pass a 1-20in. sieve.

Two cements of previously ascertained stability of volume were used for the experiments:—

A, produced from the well-known lias formations near Rugby.

B, produced from the chalk marl deposits and clay in the Midland Counties.

The bottle test, previously described as having been carried out with the coal mortars, was somewhat crude, and also qualitative rather than quantitative; moreover, as previously pointed out, it might conceivably be influenced by the difference between the co-efficient of expansion of the glass and of the mortars at different temperatures. In order, therefore, to render them more accurate and of a quantitative nature, the subsequent experiments with coke breeze mortars were made with prisms or rectangular bars 100 millimetres long and 22mm by 22mm cross section, the expansion and contraction of which were accurately measured in the Bauschinger Micrometer Calliper Apparatus.

Cement and Standard Sand.—Eight bars or prisms were made with each kind of cement, four being made with neat cement, and four with 3—1 standard sand-cement mortar. Two of each series were kept entirely in air and two placed in water after 24 hours, and kept therein during the three months with which this record deals. Each bar was measured after 1 day, 7 days, 28 days, and 3 months, and the measurements recorded, the results of which are given in Appendix II.

Breeze Sample No. I.—Described as "Fine Pan Breeze;" it consisted mainly of clinker and coke with traces only of coal. Separated out as previously described, about 32 per cent. passed through a 1-10in. sieve, and 35 per cent., through a ¼in. sieve. Of the remaining 33 per cent. about 22 per cent. was clinkers, and 11 per cent. coke, with .08 per cent. coal. Each of these fractions, after being broken up to pass a 1-20in. sieve, was made into prisms or bars with the two different kinds of cement, two bars of each being left in air, and two placed in water after 24 hours, and measured after 1 day, 7 days, 28 days, and 3 months. The figures giving details of these experiments will be found in appendix III. It will be observed that the expansion, APPENDIX. VIII.

Breeze Sample No. VI. (Ashes or Furnace Refuse).

Fractions.	Percentage of original sample.	Fineness after crushing to pass $\frac{1}{20}''$ sieve. Residue per cent on following sieves.			Cement Sample used.	Percentage Expansion or Contraction.							
						Air Bars.				Water Bars.			
		$\frac{1}{100}''$	$\frac{1}{76}''$	$\frac{1}{50}''$		1 day.	7 days.	28 days.	3 months.	1 day.	7 days.	28 days.	3 months.
Average	—	—	—	—	A	+ ·003*	— ·039	— ·069	— ·084	+ ·074*	+ ·092	+ ·092	+ ·095
					B	— ·003*	— ·039	— ·058	— ·074	+ ·049*	+ ·044	+ ·047	+ ·040
Thro' $\frac{1}{10}''$ sieve	21·7	67	58	52	A	·000	— ·028	— ·057	— ·080	+ ·071	+ ·085	+ ·087	+ ·081
					B	+ ·003	— ·008	— ·037	— ·065	+ ·081	+ ·087	+ ·092	+ ·086
Thro' $\frac{1}{4}''$ sieve	15·55	72	65	61	A	+ ·002	— ·033	— ·058	— ·071	+ ·049	+ ·057	+ ·048	+ ·054
					B	— ·013	— ·052	— ·051	— ·084	+ ·039	+ ·042	+ ·045	+ ·044
Coke ..	34·38	62	52·5	41	A	— ·035	— ·095	— ·119	— ·127	+ ·070	+ ·070	+ ·059	+ ·061
					B	— ·022	— ·035	— ·091	— ·097	·000	— ·005	— ·005	— ·008
Clinkers ..	27·22	75·0	69	60	A	+ ·002	— ·037	— ·066	— ·087	+ ·025	+ ·029	+ ·023	+ ·021
					B	— ·017	— ·190	— ·236	— ·224	— ·005	— ·006	— ·064	— ·073
Shale ..	1·15	73·6	67·2	62			Insufficient.				Insufficient.		

+ Indicates Expansion. — Indicates Contraction. * = 2-day Measurements.

though measurable, is practically negligible in each case, being about 0.1 per cent.; the air bars as with the standard sand bars, generally show slight contraction.

The two cements give identical results with each fraction or portion of the breeze, and the same remark will be found as a general rule to apply throughout to the whole of the subsequent experiments, whether the expansion be great or small.

Breeze Sample No. II.—Described as "Coarse Pan Breeze." This sample consisted of coke and clinker only, in pieces averaging about 2in. diameter, the proportions being about 35 per cent. of clinker to 65 per cent. of coke. Treated in an exactly similar manner to No. 1, the results are likewise practically negative, as will be seen by reference to appendix IV.

Breeze Sample No. III.—Described as "Coke Breeze," consisted of coke and clinker, with a little coal. The coke varied from 2in. diameter to fine dust. About 48 per cent. passed through a ¼in. sieve; the remaining 52 per cent. sorted over gave 40.6 per cent. coke, 8.6 per cent. clinker, and 2.64 per cent. coal. These results, detailed in appendix V., are also mainly negative. The coal being such a small fraction, it was not possible to make such extended experiments as one would wish, but so far as they go, they show that this particular coal, a species of anthracite, was practically harmless.

Breeze Sample No. IV.—Described as "Furnace Ashes." This sample was very damp when received, and had to be dried before it could be treated. About 26 per cent. passed through a 1-10in. sieve, and 22 per cent. through a ¼in. The remaining 52 per cent. was sorted out into coke about 15 per cent., coal 1.5 per cent., and clinkers 35½ per cent. Each of these five fractions tested with the two cements as before described, again gave practically negative results as per appendix VI.

Breeze Sample No. V.—Described as "Gas Works Clinkers," consisted of clinkers only, ranging in size from 4in. diameter downwards. They were crushed to pass a 1-20in. sieve as before described, and tested in the same way as previous samples, but with negative results, as per appendix VII.

All the foregoing samples having given negative results, attention was next directed to samples of "Breeze" which the contractors supplying them described as "sometimes used for floors, but which they neither used nor recommended;" Nos. VII., IX. and X., moreover, were described as "such that would not be allowed by a clerk of works for fireproof flooring," but the author found them to differ very little indeed from the ingredients found in many samples of breeze concrete taken from important works.

Breeze Sample No. VI.—Described as "Ashes or Furnace Refuse." About 21½ per cent. passed through a 1-10in. sieve and 15½ per cent. through a ¼in. sieve. The remaining 63 per cent. after sorting gave roughly 34 per cent. coke, 27 per cent. clinkers, and 1 per cent. shaley matter.

Treated as before the results were again negative, as will be seen from the appendix VIII.

Breeze Sample No. VII.—Described as "Ashes or Furnace Refuse. About 15 per cent. passed through a 1-10in. sieve and 17 per cent. through a ¼in. sieve, the residue of 68 per cent. on the ¼in. sieve giving 32 per cent. clinkers, 23 per cent. coke, and 13 per cent. coal.

It will be noticed that this sample contains a considerable quantity of coal, whereas No. 6, a material described by the suppliers in exactly the same terms, contains none; as will be seen by reference to appendix IX., this coal does not appear to have exerted any deleterious influence upon the specimens, probably due to its being of an anthracitic rather than of a bituminous nature, but this point will be dealt with more fully later on.

(*To be concluded.*)

R.I.B.A.

At the meeting of the R.I.B.A., held on April 19th, the hon. secretary (Mr. Alexander Graham) regretfully announced the decease of the following associates:—Mr. Charles Thomas Whitley, elected in 1870; Mr. William Candler Reed, 1845; and Mr. Horace Moger, 1903.

APPENDIX IX.

Breeze Sample No. VII. (Ashes or Furnace Refuse).

Fractions.	Percentage of original sample	Fineness after crushing to pass $\frac{1}{20}''$ sieve. Residue per cent. on following sieves.			Cement Sample used.	Percentage Expansion or Contraction.							
						Air Bars.				Water Bars.			
		$\frac{1}{100}''$	$\frac{1}{76}''$	$\frac{1}{50}''$		1 day.	7 days.	28 days.	3 months.	1 day	7 days.	28 days.	3 months.
Average	—	—	—	—	A	+ ·016*	— ·051	— ·081	— ·092	+ ·069*	+ ·067	+ ·067	+ ·066
					B	— ·004*	— ·034	— ·004	— ·012	+ ·014*	+ ·017	+ ·017	+ ·016
Thro' $\frac{1}{10}''$ sieve	14·89	63·0	56	51	A	+ 005*	— ·028	— ·053	— ·062	+ ·070*	+ ·066	+ ·076	+ ·077
					B	— ·005*	— ·078	— ·118	— ·142	+ ·040*	+ ·038	+ ·048	+ ·049
Thro' $\frac{1}{4}''$ sieve	17·37	68·0	62	58	A	+ ·005*	— ·023	— ·048	— ·062	+ ·050*	+ ·058	+ ·053	+ ·051
					B	— ·012*	— ·040	— ·050	— ·064	+ ·010*	— ·011	— ·012	— ·013
Coal ...	12·71	73	67	58	A	+ ·056*	+ 015	— ·012	— ·054	+ ·104*	+ ·130	+ ·122	+ ·122
					B	— ·011*	— ·030	— ·052	— 069	+ ·146*	+ ·116	+ ·126	+ ·121
Coke ...	22·88	61	55	50	A	+ ·011*	— ·020	— ·037	— 074	+ ·041*	+ ·037	— ·034	— ·019
					B	— 004*	— ·035	— ·052	— .079	+ ·051*	+ ·013	— ·003	— ·022
Clinkers ...	32·15	69·0	63	53	A	·000*	— ·027	— ·051	— 093	+ ·086*	+ ·081	omitted	+ ·066
					B	— ·009*	— ·030	— ·042	— 074	+ ·016*	— ·024	— ·032	— ·029

+ Indicates Expansion. — Indicates Contraction. * = 2-day Measurements

THE BUILDING TRADES' EXHIBITION.

SECOND NOTICE.

Visit of the Prince and Princess of Wales.

On Saturday last, April 24th inst., the Prince and Princess of Wales, accompanied by Lady Shaftesbury and the Hon. Derek Keppel, paid the Exhibition a visit extending over an hour and three-quarters. The Royal party arrived punctually at noon, and were received at the entrance by Mr. H. G. Montgomery, M.P., and Mr. Hugh C. Montgomery, the Directors. The Prince and Princess evidently took a keen interest in the exhibits, and entered into animated conversation with the attendants wherever progress was arrested. The Royal party walked down the gangway between Rows D and E, and halts were made at the stands of the following exhibitors:—Hall and Co.; Carter and Co. (where the Prince made a minute examination of the various exhibits); Emdeca Sanitary and Artistic Metal Decoration Co., Ltd; J. A. King and Co.; Newellite Glass Tile Co.; Campbell Smith and Co.; and the Trussed Concrete Steel Co., Ltd., where the first stop of any length was made to inspect the manufacture of models of the Kahn Bar. Passing on, the Royal party visited the following stands:—C. H. Norris, Ltd.; Pinchin, Johnson and Co., Ltd.; Stavers and Stavers; The "Excellence" Wood Block Flooring Co.; Kleine Patent Fire-resisting Flooring Syndicate, Ltd.; and the Associated Portland Cement Co.'s stand, where the Prince witnessed a demonstration of the capabilities of the concrete-crushing machine. Continuing down the same row, the Royal party stopped at the stands of Höfler, Ltd.; The Durato Asbestos Flooring Co.; Wilkinson, Heywood and Clark, Ltd.; The Zeta Wood Flooring Co.; James Gibbons; H. C. Cleaver, Ltd.; and R. Waygood and Co., Ltd., at which the perfect little model of a passenger lift was operated at the request of the Prince. Gross, Sherwood and Heald's Rystolite was next inspected, and then the annexe was entered. Passing between rows Q and R, the stands of Duggan, Neel and McColm; Doulton and Co., Ltd.; Gardel, Ltd.; Wm. Harland; Yates Haywood and Co. Ltd.; and Werner, Pfleiderer, and Perkins, were the objects of a close and interested examination. The remaining stands viewed in the annexe were: The India Rubber, Gutta Percha and Telegraph Works Co.; Sirapite Plaster; Jos. F. Ebner; The Guild of Decorators' Syndicate, Ltd.; The Eureka Sash Balance; Allen and Norris; The Birmingham Guild of Handicrafts, Ltd.; The Binfield Brick and Tile Co.; and The British Uralite Co., at which point the main hall was again entered. Passing between Rows A and B, and, incidentally, displaying great interest in the following stands:—C. A. Peters, Ltd.; Clark and Co. (Xelite); Phillips and Son; The Patent Indented Steel Bar Co. (where the Prince listened attentively to a description of the firm's reinforcement), the Royal party entered the passage between Rows C and D, and inspected the stands of the Crittall Manufacturing Co.; The Newellite Glass Tile Co.; Wm. Oliver and Sons; and The Bath Cabinet Makers Co., Ltd. The stands of McNeill and Co.; The Daneshill Brickworks; The British Stone and Marlbe Co.; The Patent Tip-up Bath Co.; Thos. Mitchell; The Aerograph Co., Ltd.; and Dawson and Co., Ltd.; next received interested attention. The party having now arrived at the entrance, a number of the stands occupying wall spaces were examined, including those of the Manu-Marble Co., Ltd.; The Patent Safety Ladder Co.; and The Non-Explosive Gas Co. Passing down the gangway between Rows G and H, the Royal party paid particular attention to the stands of the following exhibitors:—Ellkay and Co.; John Line and Sons; and Bellman, Ivey and Carter; and returning between Rows F and G, those of Major and Co.; Geo. Farmiloe and Co.; Wm. Thomas and Co.; Candy and Co.; and The Well Fire Foundry Co. At the stand of Ripolin, Ltd., the Princess graciously accepted a beautiful bouquet, which was presented by Miss Heath. The Royal visit concluded with the inspection of four more stands, namely, those of H. J. and C. Major; John Daymond and Son; Mallinson and Son; and Benham and Sons. Passing through the vestibule the Prince and Princess mounted the big Daimler car and drove away.

National Federation of Building Trades' Employers.

On Tuesday, April 20th, representatives of the National Federation of Building Trades Employers' Federation, paid an official visit to the Building Exhibition at Olympia, and, after making a round of inspection, the members were entertained to tea as the guests of Messrs. H. G. and H. C. Montgomery, the promoters of the Exhibition. The tea, which commenced at 6 p.m., took place in the Grill Room.

At the conclusion of the meal, Mr. Ernest J. Brown proposed a hearty vote of thanks to Mr. Montgomery for the courtesy extended to the Federation. His remarks would be brief, as doubtless they were all very anxious further to inspect the very fine Exhibition. It was pleasant to feel that the members of the Federation were not strangers there. He believed that the present exhibition was the finest ever got together, and it spoke eloquently for the splendid powers of organisation of Mr. H. G. Montgomery and

Photo: Topical.

THE PRINCE AND PRINCESS AT THE EXHIBITION. SATURDAY. APRIL 24.

his brother; to them both he extended his hearty congratulations. The Exhibition had been opened absolutely to time; and he thought it was only right to mention how greatly they appreciated the work of the younger Mr. Montgomery. The brothers were inseparable, and they were indebted to both. In conclusion he thanked them for their very kind invitation, and for proving themselves such extremely good hosts. To second the vote of thanks he would like to ask a well-known friend of theirs who had but recently returned from Germany.

Councillor John Dawson, of Dewsbury, heartily seconded the vote of thanks. He had spent some considerable time in examining the exhibits, and he would like to add his testimony to that of Mr. Brown, namely that the Exhibition was in every way excellent, and worthy of prolonged inspection. He was amazed that so much had been done in so short a time. It was true that he had just returned from visiting various important cities in Germany, in the company of the Housing and Town Planning Association. Before this it was more than thirty years since he had been to Germany; and what had always impressed him most was the wonderful structures to be seen there. The Germans had always displayed a spirit of marked cordiality and friendliness. At a banquet to which members of the English party were invited, the band played the English National Anthem as they went in. Several most cordial speeches were made, and whenever the name of an Englishman or a Yorkshireman was mentioned the band simultaneously struck up the National Anthem to an accompaniment of hearty acclamation and applause. He, unfortunately had been called upon to respond, and had done so, the while tinkling glasses with the President, a noble, grey-haired old gentleman. Everywhere kindness, and even affection, were notably manifested, and he was convinced that the more the two races knew of each other, the better would it be both for the individual and the nation. Although the Germans excelled in town planning, and the English might well learn a lesson from them, they could not equal the cottage homes of England.

Mr. H. G. Montgomery, M.P., in reply, observed that he greatly appreciated all the kind things that had been said about the Exhibition. He had listened with great interest to Mr. Dawson's remarks about his visit to Germany, and he could thoroughly endorse everything that had been said. He was pleased to announce that on Thursday (April 22nd), he was going to conduct 30 Germans over the Exhibition, and hoped to have them taken round the provinces in order to familiarise them with what was taking place in the trade. It was the first time that the Exhibition had been honoured by a visit from the Federation in its corporate capacity, and he sincerely hoped it would not be the last. He was quite confident that more prosperous times were in store for the building industry, and that business was decidedly on the mend. He hoped that, when in two years' time the Exhibition was again held, they would be able to come to him and admit the truth of his predictions.

The Bath Stone Firms, Ltd., Bath, London and Portland. Stand 155. Wall Space.

An interesting feature of this stand is a representation of the Monk's Park (Bath) stone quarry, 80ft. below the surface, in the county of Wiltshire. The stone is quarried in long tunnels, 20 to 25ft. deep, and is cut out from the solid rock, and the process of quarrying is here shown.

Examples of Portland stone and Bath stone masonry are shown. The Portland masonry is in stone from the well-known quarries at Combefield, belonging to the Bath Stone Firms, Ltd., from which the stone was taken for the bulk of the Government building in Whitehall, for the Victoria and Albert Museum (South Kensington), and for the Admiralty buildings, etc.

The Bath stone masonry is in Monk's Park stone, which is clean, fine grained, and particularly suitable for the dressings of windows and tracery work.

Samples are also shown of the firm's fluate, which is a material for hardening and preserving building stones, marbles, tiles, terracotta, etc., and is sold in the form of crystals. The following is a short list of places at which this firm's stones have been used. The name of the architect is given in parentheses):—Portland stone: Selfridge Stores, W. (R. F. Atkinson); Kingsway Hall, Kingsway, W.C (Gordon and Gunton); new offices for London, Edinburgh, and Glasgow Assurance Co., Ltd., 180, Euston Road, N. (Beresford Pite); Harcourt House, Cavendish Square, W. (Gilbert and Constanduros); Town Hall, Brixton Hill, S.W. (Warwick and Hall); Royal Exchange Buildings, E.C. (E. George and Yeates); War Office, Whitehall (W. Young); new Government offices, Great George Street, Westminster (J. M. Brydon); Victoria and Albert Museum, South Kensington (Sir Aston Webb); Admiralty Buildings, Spring Gardens and Pall Mall (Leeming and Leeming, Sir Aston Webb); Royal College of Science, South Kensington (Sir Aston Webb); Royal Infirmary, Stanley Grove, Manchester (E. T. Hall and J. Brook); Union of London and Smith's Bank, Hull (Dunn and Watson); new Central Post Office, Hull (H.M. Office of Works); new Town Hall, Stockport (Sir A. Brumwell Thomas); new Cotton Exchange, Liverpool (Matear and Simon). Bath stone: Theatre of Varieties, Tottenham (Wylson and Long); Ladies' Club, Seymour Place, London (Durward Brown); Royal Dental Hospital, Leicester Square (Young and Hall); Salisbury House, Finsbury Square (Davis and Emanuel); Moreton Hall, Warwick (Romaine-Walker and Besant); Congregational Church and School, Hainton Avenue, Grimsby (Bell, Withers, and Meredith); Roman Catholic Church, St. Mary Magdalene, Bexhill (A. Young); Lea Park Mansion, Witley, near Milford (Hants) (Paxton H. Watson); Friar Park Mansion, Henley-on-Thames (Satchwell and Edwards); flats, etc., Parkside, Knightsbridge, London (Hart and Woodhouse); King's Sanatorium, Midhurst (H. P. Adams); school for Christ's Hospital, Stammerham, Horsham (Sir Aston Webb and Ingress Bell).

Robert W. Blackwell and Co., Ltd., Parliament Chambers, 14, Great Smith Street, Westminster, S.W. Stand 259. Row R.

The Genasco ready roofing exhibited by this firm is adapted for use on structures varying in character from a factory to a farm building. The felt which constitutes an important part of Genasco is of the highest quality, and is manufactured especially for Messrs. Blackwell and Co. The saturating compound is obtained from the famous Trinidad Lake, and is possessed of many fine qualities. The firm claim for it superiority over the ordinary slate or shingles, on the ground that it will not easily catch fire, and will not warp or go to pieces through the ravages of time. It can be obtained in four styles—model, stone surface, whitestone (in two weights), and smooth surface (in four weights), each of which is described lucidly and convincingly in an interesting little booklet to be had gratis from this stand. Many styles of coloured paints designed especially for painting rubber roofings are also on show.

Bristowe and Co., 20, Tothill Street, Westminster, S.W. Stand 12. Bay. Gallery.

At this stand special attention is drawn to the rather cleverly named "Tarvia," "the material which supplies the solution of modern roadmaking problems." It can be applied either in the construction or the re-metalling of roads with any material, or as a purely surface treatment. It is supplied in liquid form or as a matrix ready for use; and as a liquid in two grades (a) for use in conjunction with dry stone for constructive purposes; (b) for surface dressing only. No less an authority than Mr. W. J. Dibdin has certified that the washings from Tarvia-treated roads could not possibly interfere with fish life in any stream whose flow is large in proportion to the quantity of road-water entering it. "Tarvia" has been supplied to H.M. India Office, and to more than 160 local authorities, as well as to several railway companies at home and abroad. Tarring machines and other appliances of this kind are also shown, as well as a number of sanitary fittings, including the Parker patent safety pipe joint for making water-tight sewers.

Vincent Brooks, Day and Son, Ltd., 48, Parker Street, Kingsway, W.C. Stand 40. Row B. Gallery.

At this stand are shown various reproductions by various processes from drawings—the process adopted where only a few copies are required being the Dorel True-Scale System, and, for larger supplies, True-Scale Photo-litho. The firm are now able to reproduce "absolutely true to scale" in one piece, subjects that are 22ft. in length. It is claimed that the prints are absolutely permanent, showing black lines on machine drawing paper, Whatman's linen, or tracing cloth, by either process.

Burn Brothers, Rotunda Works, 3, Blackfriars Road, London, S.E. Stands 38 and 39. Row B. Gallery.

Sanitary fittings in great variety, chiefly in ironwork, are shown at these extensive stands. Here are cast-iron drain pipes and soil pipes and fittings, with and without access doors; manhole covers and frames, ordinary and patent; the automatic Certus flushing tanks and flushing syphons; the patent whirl spray sewage jet, patent automatic sewage sprinkler, patent controlled syphons; various kinds of valves; drain-testing smoke machines, drain plugs and various kinds of bag and other stoppers, drain rods, suction pumps, etc.; the whole forming an instructive exhibit for those responsible for the devising, inspection, or execution of what may be distinguished as the fundamental installations of sanitary work.

George M. Callender and Co., Ltd., 25, Victoria Street, Westminster, S.W. Stand 16. Bay.

The fact that Messrs. Callender and Co.'s bituminous solution, which is on exhibition at this stand, is supplied in a form quite ready for use, without involving the addition of any thinners, is sufficient recommendation in cases where extreme expedition is the desideratum. The solution dries quickly, and forms an effective protection for iron and steel. Thus, its appropriate use upon any surface exposed to the elements, and thereby inviting the stealthy and insidious encroachment of corrosion, is

Photo: Topical.

MR. LEWIS HARCOURT, H.M. FIRST COMMISSIONER OF WORKS, VISITS THE EXHIBITION ON THURSDAY LAST.

clearly demonstrated. In view of the fact that an immense amount of iron and steel is now being used in constructional work, it becomes increasingly apparent that more adequate measures must be taken to ensure its complete protection. Thus, any development in the direction of solving a serious and pressing problem should meet with rightful recognition. The solution dries hard, and in addition to being proof against cracking or flaking, is guaranteed to be unaffected by extremes of temperature.

Campbell, Smith and Co., Ltd., 25, Newman Street, Oxford Street, W. Stand 70. Row D.

This firm show a new and improved form of the patent Bexhill casement, which consists of a pair of casements hung together in the centre, with the ends pivoted into blocks which slide in channels in the head and sill. A cam action in the head has been substituted for rack action in the sill. These casements are simple and solid in construction, having steel channels with gunmetal runners. They can be rigidly locked in any position, and cannot rattle. The fittings being of solid metal, there is no possibility of shrinkage. The casements can, by a simple movement, be arranged in several positions, conveniently for cleaning without danger, or ventilation without draught, and when closed they are rain-proof and draught-proof.

Coatostone Decoration Co., 77, Mortimer Street London, W. Stand 17. Bay.

Coatostone, a composition giving the effect of natural stone to plaster, cement, wood, and other surfaces, is shown in its various applications, and in several tints, to imitate various kinds of stone. It is also largely used for the renovation of old stonework, and acts as a preservative. It flows evenly from the brush (to which it does no injury), and is adaptable to either indoor or outdoor work. It is particularly useful for the freshening of old cement stucco or terra-cotta fronts. Coatostone is applied like ordinary plaster, and gives a natural stone appearance. It is trowelled on to brickwork with a backing of Keene's or Portland cement and sand, and is finished from ⅛in. to ¼in. in thickness. As made for external work, it is weather-resisting, and proof against the acids of the atmosphere. Coatostone special roughcast is supplied in white or colours to approval, and is sent out mixed as a thick paste ready for immediate use. Applied with a large brush and stippled with a sponge, it will give a roughcast effect to any texture desired. Other specialities are a colouring for roughcast and brickwork, a stone preservative, and a stone backing solution.

The decoration of this exceedingly artistic pavilion is well supported by some excellent examples of joinery, in particular the nine-panelled door, which is of excellent workmanship. The joinery work was executed by Messrs. P. H. Barker and Son, of Hitchin.

Crittall Manufacturing Co., Ltd., 11 and 12 Finsbury Square, London, E.C. Stand 49. Row C.

Metal casements, patent sashes, metal shop fronts, and wrought-iron gates and fencing are shown at this stand. The "Economic" casement is recommended on the grounds that it will not warp or twist, will always open and close easily, offers the minimum obstruction to light, is watertight and weather-tight, provides against condensation, does not rattle, and allows ample adjustment for ventilation. In the manufacture of these casements, there is no brazing, every joint being welded, the bars of various sections, and of different metals. As an alternative to lead cames, the firm recommend the patent "Fenestra" joint, in either tee or moulded sections, in which a slight swelling in the vertical bar at each cross joint supersedes the straight intersections of the mitred joint. The result is an eminently architectural sash. Official tests, conducted at the Royal Arsenal, Woolwich, of the "Fenestra" joint sashes, show their completely satisfactory behaviour under strong wind-pressure. The firm show, also, various types of steel lockers and cupboards, compact, cleanly, and sanitary, with many specimens of storage bins, racking, and shelving.

Messrs. R. Crittall and Co., 197, Wardour Street, W. Stand 252. Row Q.

In our notice of Messrs. Crittall and Co.'s exhibit last week, we omitted to mention an interesting new development in heating apparatus which may be seen at their stand. It consists of a hot panel and a heated floor. The idea is specially applicable to sanitary blocks in hospitals and bath-rooms, and is carried out in conjunction with the jointless flooring material. In the present instance the Durato flooring has been used both for the panel and the floor. The heating coil is embedded in the panel or floor itself, and consists of solid drawn copper pipes, so that there is no danger of leakage. The valves are outside, and the temperature can therefore be controlled without difficulty. Architects will doubtless be interested in this new development in heating, and will pay a visit to the stand to see the panel and floor for themselves. Where it is necessary to get rid of the usual radiator, this method of heating will doubtless make a strong appeal.

Duggan, Neel and McColm, Ltd., Langbourne Wharf, Milwall, E. Stand 49. Row F.

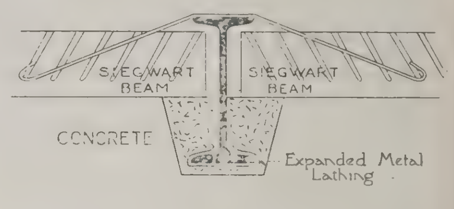
In a tastefully-designed stand are illustrated various methods of using the "Dodo" enamel, which, while applied as easily as paint, is far more durable and gives a much finer finish. It is an air-drying enamel, and gives a surface equalling that of the highest-class coach work. It is suitable for both outside and inside work and, being specially prepared to withstand sea air and salt water, it is particularly suitable for yachts. It may be tinted to any shade for matching. "Dodo" flatting dries with a velvety, non-glossy flat surface, which is secured without special care in the application. It is prepared in eggshell finish and dead flat. "Dodo" undercoating, and a special priming coat, the "Dodo"-filler, are also shown.

England Works, North Street, Leeds. Stand 149. Wall Space.

Objects of special interest to those who are concerned in arranging the fittings of schools and similar buildings are shown here in considerable variety. They include the England patent self-contained cloak-room fittings, patent automatic ball-bearing door pivot, patent steel skylight and casement frames, a patent emergency bolt for double-action doors; and samples of the "England" patent tubular framed wire doors.

Empire Stone Co., Ltd., 231, Strand, W.C. Stand 21. Row B. Gallery.

At this stand there is a fine collection of paving slabs as supplied to the principal Corporations; some handsome red paving slabs; samples of "Empire" stone dressings in various colours; a moulded spandril and square steps; a combined kerb and channel; samples of *in situ* paving, grooved and channelled, as laid for numerous schools, asylums, cattle markets, stables, etc.; mosaic and terrazzo paving steps, dado, etc.; and the "Siegwart" fireproof floor. The "Siegwart" floor is of ferro-concrete construction, which can be quickly placed in position without the use of centring, and is at once completely dry and load-bearing. It is of the hollow-beam type, and the beams are made up to 20ft. spans, supporting girders being employed for greater spans or exceptional requirements as to load. The floor is sound-proof and a bad conductor of temperature, and is, of course, fire-resisting. Many interesting photographs of works in which the firm's specialities have been employed are shown at the stand.

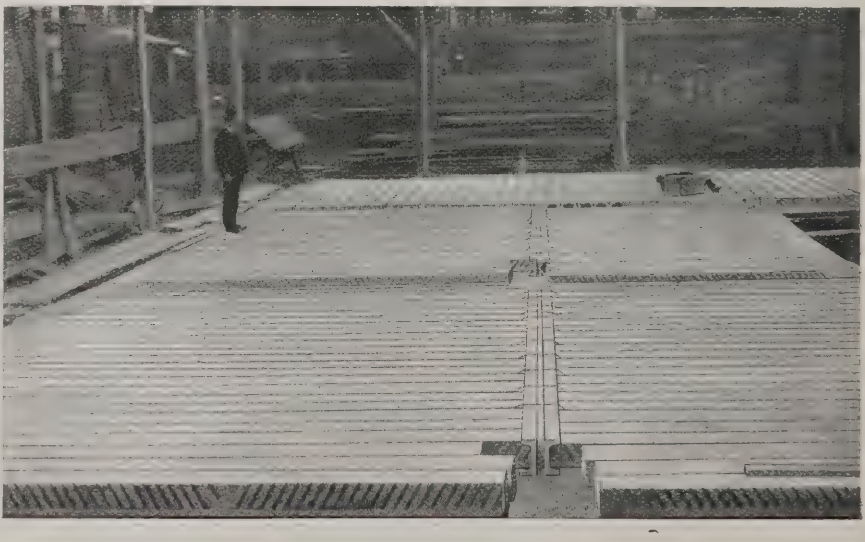


George Farmiloe and Sons, Ltd., 34, St. John Street, E.C. Stand 95. Row F.

Paints, lead, glass, casements, and sanitary fittings make up an exhibit that certainly does not lack variety of interest. Among the paints is Zingessol, a washable water paint, the colours of which, as shown at the stand, lend emphasis to the claim that they are applicable to the highest class of decorative work. The glass, much of which is shown *in situ*, forming parts of the firm's pavilion, is of various kinds, plain and fancy, sheet, rolled, and muffled, bevelled, silvered and embossed. Conspicuous in this class of exhibits is the firm's registered "Oceanic" glass, as adopted at the new War Office. This glass, while showing a distinctly descriptive and artistic pattern, with a seashell for motive, has a smooth and flat cutting surface. It is made in four standard tints—blue, green, claret, and amber—and of a special green for use where the light is particularly strong.

William E. Farrer, Star Works, Cambridge Street, Birmingham; also London, Leeds, and Cardiff. Stand 5. Row B. Gallery.

Shown at this stand is Farrer's 1909 pattern patent Facile rotary sewage distributor.



THE SIEGWART FLOOR, (EMPIRE STONE CO., LTD.)

Its special feature is that no dosing valves or apparatus of any kind are required, a patent gauging tube in the stand post controlling the starting and stopping of the distributor, and causing dosing or continuous distribution according to the requirements of the supply. Farrer's patent sludge valve and ejector combined is also shown. At this stand are shown also samples of the Helliwell patent glazing, which, while requiring neither putty nor paint, is guaranteed absolutely watertight. The system is very extensively employed for roof lights on railway stations, market halls, baths, factories, and horticultural buildings. Also is shown the Helliwell Openshut louvre ventilator, which is made in steel, zinc, or copper, and is worked from the ground level by rods and screw gearing. The ventilator is so arranged that when it is open neither snow nor rain can drive in. It is adapted for public baths, markets, factories, and all roofs where ventilation without leakage is required. The Helliwell patent glazing works are at Brighouse, Yorkshire; London offices, 11, Victoria Street, Westminster, S.W.

The Farringdon Works and H. Pontifex and Sons, Ltd., Shoe Lane, London, E.C. Stand 134. Row H.

The display of baths and sanitary goods at this stand includes, in the former class, porcelain enamelled iron baths of various patterns, among them being a bath specially designed for use in cottages. Among the lavatories are some that have been adopted for L.C.C. schools. The closets and sinks show details that are of special interest.

John Freeman, Sons and Co., Ltd., Penryn, Cornwall, and at 11, Little College Street, Westminster, S.W. Stand 29. Row B. Gallery.

The quarries of Messrs. John Freeman and Co. are capable of an annual production of no less an amount of dressed granite than 500,000 cubic feet. It has been supplied by this firm to a large number of Government works both at home and abroad, and is now being prepared for the new entrance lock, etc., of H.M. Dockyard, Portsmouth. The following is a selection from a somewhat lengthy list of contracts where this company's Cornish granite has been used:—L.C.C. Technical Schools, Southampton Row; new Scotland Yard extension; new Sessions House, Old Bailey; Ashton Memorial, Lancaster; Embankment wall; new London County Council Hall; foundation, Victoria Memorial, Calcutta; new entrance lock, Bombay; new entrance lock, West Hartlepool; Vauxhall Bridge; Kew Bridge; H.M. Dockyards, Keyham, Gibralter, and Portsmouth; new entrance lock, Newport; etc., etc.

B. Finch and Co., Ltd., 82, Belvedere Road, S.E. Stand 237. Row P.

This firm's new patent Weir lavatory has its overflow in the form of a weir, so that any excess of incoming water finds a rapid and easy outlet in the form of a cascade into a cylindrical recess at the back of the lavatory, where it passes through a grating. The largest sized lavatory valves in use cannot cause an overflow, so that disaster to ceilings below is entirely prevented. At each discharge the overflow chamber is flushed automatically, and the recess is sufficiently large to admit the hand with a sponge for cleaning. This principle is also applied to lavatories in table ranges, for use in schools, clubs, and institutions; the table range having as its principal feature a channel midway of and integral with the basins to receive the waste. The weir system is also seen in a very ingeniously devised surgical lavatory, which, as well as the knee-action waste-fitted lavatory, will be examined with special interest by architects concerned in hospital work. Finch's bath shower is worked by one lever, blending the water perfectly, and giving any desired temperature without risk of scalding; and their silent Facile closet, of which the flush is hydraulic, not pneumatic, requires no headroom, the cistern resting on the seat.

Ham, Baker and Co., Ltd., 13, Grosvenor Road, Westminster. Stand 19, Bay.

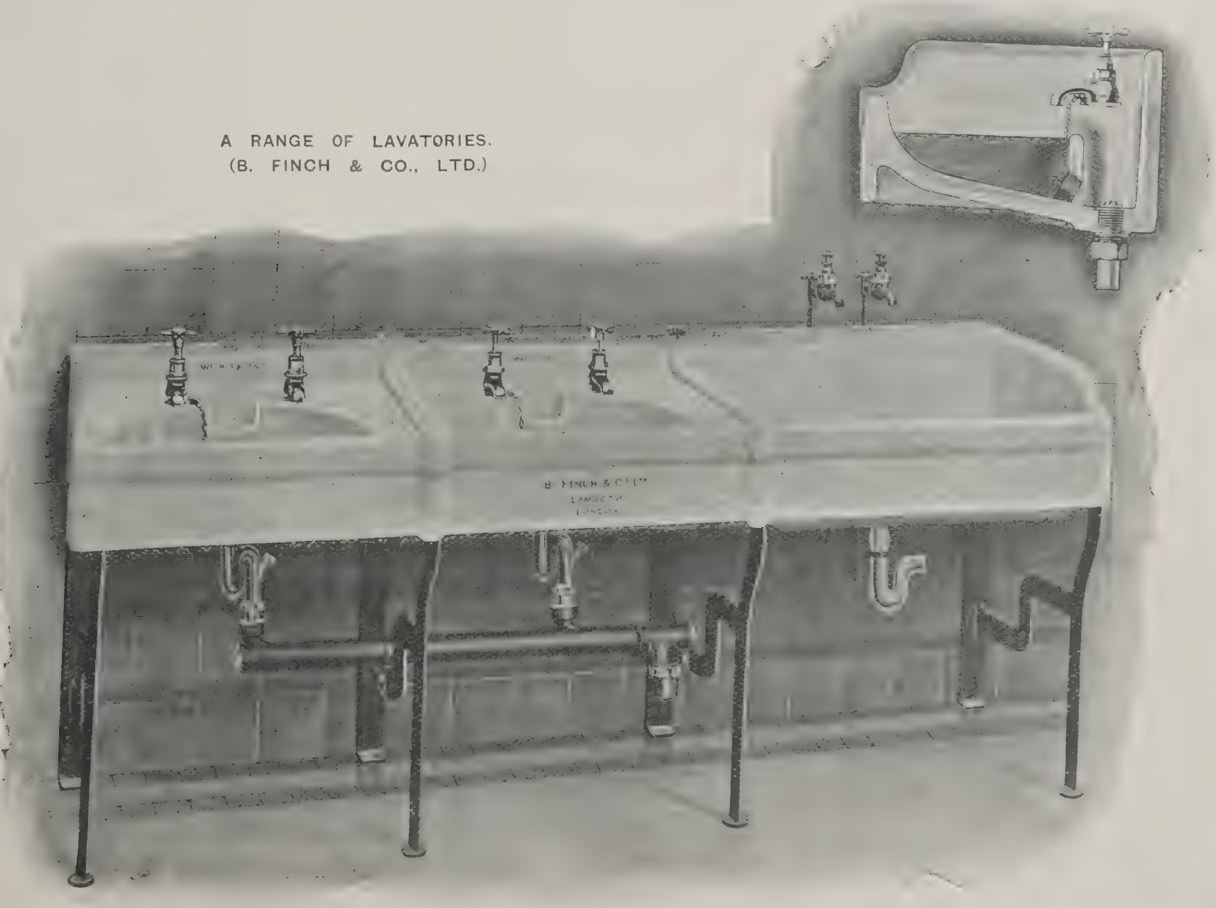
Noticeable among the sewage installation exhibits at this stand are working models of (1) a patent automatic travelling distributor, for rectangular filter beds, and (2) a patent rotary automatic distributor. Some fixed sprays for filter beds are also shown, as several types of pumps for the use of contractors.

S. C. and P. Harding, Ltd., Alliance Works Denmark Hill, S.E.; and Paris. Stand 28. Row B. Gallery.

Many objects of interest to the architectural and engineering draughtsman, and to the surveyor, are shown on this stand. A special line is the "Alliance" refill sectional and field book, which is handy, neat, and economical. The cover is made of pliable Morocco leather, opening perfectly flat, and refills can be obtained in substitution for the sheets that are filled up. The "Alliance" sectional pads are printed directly from a specially engraved block, and consequently a very high degree of accuracy is ensured. These are stocked in rulings of various sections—eighths, tenths, twelfths, twentieths of inches, and in millimetres. The improved drawing-office furniture and fittings shown include the "Perfect" adjustable drawing table, specially constructed to enable the draughtsman to work standing or sitting, the table being easily adjustable to any plane or angle; the "Improved Perfect" drawing cabinet for filing drawings on the vertical system, which, while only 20ins. in depth, is capable of holding 300 to 400 drawings; the adjustable drawing board trestle, which folds into a very small space when not in use; and drawing cabinets made on the sectional division principle. The firm also show samples of their "True to Scale" method of copying plans, etc.

Wm. Harland and Sons, Merton, London, S.W. Stand 257. Row R.

A handsome white pavilion shows to advantage some of this firm's enamels and varnishes. The structural portions are treated with Harland's enamel filling composition and preparation white, and finished with their non-cracking "Snowite" enamel. Inside the panels show a few of the firm's



A RANGE OF LAVATORIES.
(B. FINCH & CO., LTD.)

flat enamels of various colours; and plaster slabs show the applicability of various paint products to plaster walls.

Hempstead Patent Brick Co., Hemel Hempstead, Herts. Stand 79. Row E.

A building constructed of Hempstead hollow porous terra-cotta partition blocks affords a striking illustration of the actual appearance of these blocks *in situ*; and sample blocks of various sizes are exposed for handling and inspection. Among further exhibits are tubes and blocks for fireproof floors, firing bricks and oven tiles, and models of several fireproof doors.

Japanol Enamel Co., Culford Works, London, N. Stand 79. Row E.

Japanol is supplied in thirty-six stock tints for inside and outside work, on wood, metal, stone, cement, brickwork, plaster, etc., and many of these tints and their applications are exhibited at this stand. It is made as an enamel and also as a glossy or flat paint, and is recommended for ship, yacht, house, and general painting. The bath enamel Japanol is supplied at the same price as the other varieties.

George Jennings, Ltd., Lambeth Palace Road, London, S.E. Stand 25a. Row B. Gallery.

This well-known firm of sanitary engineers is showing among many other well-chosen exhibits, a bathroom in the Empire style, fitted in a most elaborate manner with a lavatory and bath complete. This firm's "Closet of the Century" possesses many features of exceptional merit, chief among which are its simplicity, its sanitary efficiency, its effective flush, the disconnection of the closet outlet, and the "ventilation" of the syphon leg by atmospheric circulation, thus preventing any possibility of escape or accumulation of foul air. A representative range of spray baths, shower baths, lavatories, etc., is also shown. The warm fresh air ventilating grate, which is to be had in two sizes, is of pleasing design, and may be obtained with or without tile frames. The various catalogues to be had gratis are well illustrated, and many interesting reproductions of the firm's workshops, showing the actual process of an article's manufacture, are given.

The Kleine Patent Fire-Resisting Flooring Syndicate, Ltd., 133-136, High Holborn, W.C. Stand 64. Row D.

This firm have given notice that on Monday, May 3rd, at 11.30, they will carry out various fall or impact tests on their exhibit, which will be broken up. These fall or impact tests will be given for the purpose of demonstrating the safety of the floor under falling weights and the complete absence of thrust on the steelwork. Architects and engineers who would like to be present should apply for a card of admission to the Kleine Syndicate, at 133, High Holborn, or at the stand.

Leeds Pottery and Middleton Fireclay Works, Leeds. London Office: W. P. Corby, 11 and 12, Finsbury Square, E.C. Stand 23 Bay. Gallery.

This is a very extensive display of various descriptions of earthenware goods, including faience, terra cotta, bricks of various descriptions, and sanitary ware. The exhibit of faience, terra-cotta, and Ceramo ware shows the adaptability of the construction and decoration, and is intended to prove the possibility of obtaining a permanent colour scheme under the most trying atmospheric conditions. There is a fine collection of glazed bricks in white, ivory white, salt glaze, and many other colours, and as these are made by the plastic process they are thoroughly homogeneous, the glaze is permanent, and the colours are fast. They are, therefore, confidently recommended to make sound building construction, as well as producing artistic effect. High quality marks also the red facing bricks, as well as those for engineering construction. The sanitary goods shown at this stand are also a varied and interesting display, which will well repay careful inspection.

Mander Bros., Wolverhampton, and Noel Street, Oxford Street, W. Stand 48. Row C.

Among the specialities on view at this stand are Matsine, Olsina water paint, Suffield green, Florax, Olsina white enamel, wood filler, Woodsolin, and many kinds of varnish, among which latter may be mentioned white Coburg, white oil, pale copal, specially adapted to indoor work; fine copal for use on exposed surfaces, etc., and many other kinds. Matsine is the name given to a series of transparent colours which show richly against the background upon which they are placed. Olsina water paint presents a series of shades at once simple and refined. Suffield green is the result of many years of experiment in the laboratory and retains its colour admirably. Florax is a household sanitary finish, primarily for the purpose of preserving stained or natural wood. Olsina white enamel gives a pure porcelain-like finish; and while the wood filler fills pores of open grained woods without detracting from the beauty of the grain, Woodsolin is an effectual preventive of dry rot and other forms of decay.

The Nautilus Fire Co., Ltd., 215, Tottenham Court Road; also at Yeovil and Worksop. Stand 172. Wall Space.

The neat, compact, and effective improved "Nautilus" grates, interiors and ranges shown at this stand are supplemented by an exhibit of a patented improvement in domestic kitchen range boilers—the "Asbest," which, of wrought-iron, with a central flue, is cased in asbestos, and is exceptionally durable and efficient, the packing reducing liability to damage, and preventing waste of heat. The Bush fire will be examined with interest; and the firm's scheme—shown in operation—for heating three rooms from one fire is attracting much attention.

Norton and Gregory, Ltd., Castle Lane, Buckingham Gate, Westminster; and Glasgow. Stand 1 Bay. Gallery.

Prominent amongst the most varied and most interesting array of exhibits at this stand are samples of the firm's "Perfect" adjustable drawing table, which is so constructed as to enable the worker to vary the slope of his drawing boards at will to any plane between horizontal and vertical—an immense advantage as compared with the old but still too common unmovable bench. The drawing board is detachable, and the T-square or straightedge is kept in position by special means of attachment. The table is furnished with a lock-up drawer and a tray for instruments, and other conveniences render the apparatus a marvel of comfort and efficiency. The firm show, also, some specimens of Velography, their speedy method of plan reproduction on various media, such as linen, parchment, and paper. The firm apparently supply every requisite for the draughtsman's office, and there is a particularly fine show of mathematical, surveying, and drawing instruments. Two useful drawing instruments are the "Simplon" adjusting protractor set square, of which the arms can be fixed at any required angle by means of a thumbscrew; and the "Simplon" adjusting reversible set square, which, mounted on a brass base, can be set at any angle, and reversed like an ordinary set square. The "Simplon" section lines is another ingeniously adjustable instrument.

J. F. Phillips and Son, 21, Old Queen St., Westminster, and at Brighton. Stands 205 and 906. Row N.

In our notice of this firm's exhibit of Barker's patent cable system of vacuum water heating (low pressure), it should have been stated that recent installations on the cable system, actually carried out by Messrs. J. F. Phillips and Son, 21, Old Queen Street, Westminster, S.W., Richmond Buildings, Brighton, and Knight Street, Liverpool, are as follows:—New Elementary Schools, Ramsgate; new Secondary Schools, Chichester; Battle Union, Sussex (complete domestic water supplies to infirmaries, casual wards, dining halls, heating, etc., etc.); Royal Portsmouth Hospital, Portsea; Avenue Lodge, Patcham; Knight and Lee, Ltd. (showrooms, workrooms, offices, etc.); Southsea; Union Church, Brighton, with school and institute; Rusper Church, Sussex; the Tabernacle, Worthing; the Standard Tablet Factory, Hove; the Aquarium, Brighton, etc., etc.

James D. Prior, Empire Works, Holiday Street, Birmingham, Stand 166. Wall Space.

At this stand is given a working demonstration of a method of warming bedrooms and hall with the "waste heat" from the sitting-room fire by means of the Venetian firegrate and heat distributor. The latter is a peculiar form of tubular hot-water boiler, constructed of seamless copper tubes and gun-metal fittings. It collects most of the heat would would ordinarily escape up the chimney, and applies it to the economical heating of other rooms.

Alexander Ritchie and Co., Ltd., Castle Baynard Wharf, 12, Upper Thames St., E.C. Stand No. 153. Wall Space.

The fire has been described as "the heart of the house," and doubtless the same idea underlies the declared determination of the patriot to "fight for hearth and home." Modern taste is providing him with hearths that are worth fighting for, whether they are regarded from the practical, the æsthetic, or the merely sentimental point of view.

The "Castle Baynard" hearth fires exhibited by this firm are admirable for their efficiency, cleanlines, and comeliness. They are suitable either for raised hearths or for hearths upon the floor level. The fire is formed of firebrick in three parts, the back being circular in shape, and overhanging. An oval-bottomed grate fits into a rebate, and is removable to give access to the ash pan In this system, air ducts are discarded, and it is not necessary to sink the grate below the floor level.

This firm show also the "Drawwell" grate.

The firm, who are contractors to H.M. Government, the London County Council, the Corporation of the City of London, the Metropolitan Asylums Board, and many borough councils and other local boards, are manufacturers of all kinds of hardware, and they show a selection of their "Castle Baynard" kitcheners, baths, lavatories, and builders' ironmongery in general. Their catalogue, consisting of 660 pages, lavishly illustrated, must be one of the most comprehensive of its kind, and it includes sanitary appliances and heating apparatus, ornamental signs, railings and gates, balconies and porches, ventilating apparatus, and stable and cowhouse fittings, as well as a complete collection of gardening implements and horticultural buildings and apparatus.

An extensive list of buildings in which this firm's goods have been requisitioned could be given, but the firm prefer not to publish such lists.

Arthur Sanderson and Sons, Ltd., 52-55, Berners Street, W. Stand 67. Row D.

This firm have a very strong line in the now well-known Paripan, which is described as "The British-made lacquer." It is made in white and all colours, and in two varieties, glossy and flat, is applicable to all surfaces, and can be used for exterior work as well as for interior decoration. It is stocked in forty-two standard colours, and any tint can be matched to order. Some very novel and beautiful designs in wall papers are shown, and there are also some most attractive decorative copper panels for friezes or for framing as pictures. It is not an exaggerated claim that their schemes in old-fashioned chintzes and panels are "novel and refreshing." Decorators and dealers in wall papers will be greatly interested in the neat, compact, adjustable wall paper stand, which enables the grouping of wall papers in varying positions and at different heights in windows and show-rooms. It is collapsible, and occupies but little space when out of use. At this stand is also shown a sample of the Gilmour door.

Sharp, Jones and Co., Parkstone, Dorset, and at Southall, Middlesex. Stand 35. Row B.

This firm is showing its ingenious rock-concrete roofing tile, the chief feature of which is the neatly-contrived double ridge which interlocks with a corresponding member on an adjacent tile, thus ensuring perfect watertightness. The material employed in the manufacture of this tile is specially selected, both as regards the aggregate and the cement; and the product results in a very dense and hard concrete, free from porosity. The method of fixing is simple in the extreme, and its effectiveness is unquestionable. This tile is to be obtained in any desired colour, which the firm guarantees to be durable. It is also made in glass, and the introduction of one or two in a roof thus permits the ingress of light, while the rigid form of the whole remains undisturbed. Messrs. Sharp, Jones and Co., have fitted their tiles on many Government buildings in the colony of Nigeria.

The Silicate Paint Co (J. B. Orr and Co., Ltd.), Charlton, London, S.E. Stand 50. Row C.

This firm have acted as pioneers in many paint productions, and their "Duresco" washable water paint had a long start of many similar commodities that now crowd the market. That it is still easily able to hold its own and to maintain and extend its vogue is a strong testimony to its value. Samples are also shown of the firm's enamel glossy varnish paint.

Josiah Smart and Son, 53, Victoria Street, Westminster, S.W. Stand 11. Row B.

At this extensive stand are shown in the asphalte section models representing the method of asphalting various kinds of roofs, of lining reservoirs, and of inserting damp-proof courses; and there are many samples of asphalte in various stages of preparation. In the tar-macadam section, there are models showing the method of laying the materials, of which numerous and various samples are exhibited.

The Stone Preservation Company, Bridge House, 181, Victoria Street, London, E.C. Stand 71. Row D.

This firm's exhibit, which is to be seen at the stand of J. A. King and Co., constitutes stone in a plastic state, with which it is possible not only to restore decayed stonework to its original appearance, but also to endue it with a permanent lease of life. In cases of ancient buildings where disintegration has set in, restoration can be effected while still preserving the venerable tone of the whole. New stonework treated by this process hardens with age, and is guaranteed effectually to resist the attack of all atmospherical acids. Many examples of restored and half-restored stone are on exhibition, and form convincing proof of the satisfactory results to be obtained. The process is economical, and can be applied effectively to ordinary cement stuccoed buildings, if not previously painted. The Royal Geological Society have acquired a specimen of stonework restored in this way to be placed in the museum.

Stothert and Pitt, Ltd., Bath; and 53, Victoria Street, S.W. Stand 3. Row B.

The "Smith" mixer for tar macadam, exhibited at this stand, is a batch mixer. It is fed while revolving, and is discharged by tilting while revolving, thus giving the clean discharge that is essential for a sticky material like tar macadam. The discharge, moreover, is under perfect control, and can be either partial or entire. The machine consists of a drum of double conical form, supported and guided by a frame, which can be tilted at will while the drum is revolving. The materials to be mixed are fed in at one end of the drum, and when mixed are discharged at the other end by tilting the drum while running at full speed. The interior of the drum is provided with rigid blades, arranged in sets, each set of blades forming a "shingled" spiral. The alternate sets are reversed winding, and overlap each other in the middle of the drum. The endwise transfer of materials set up by the spirally-arranged blades is materially assisted by the conical shape of the shell, and the resultant mixture is of the highest quality obtainable.

The Well Fire and Foundry Co., Ltd., 33, Dover Street, Piccadilly, W. Stand 100. Row F.

Besides showing their patent well fires and patent pyramid fires, this firm make an attractive display of iron mantel registers, wood mantelpieces, wrought ironwork, electric fittings, and door furniture. The appearance of the well fire principle is now too familiar to need detailed description; but it may nevertheless be usefully pointed out that the rapidly achieved popularity of the system depends on the following points:—The ashes can be removed while the fire is burning; the size of the fire can be regulated in accordance with the weather; the fire will burn for ten to twenty hours without requiring the slightest attention; it actually consumes smoke, and has cured many smoky chimneys; it will consume coal, wood, or peat. Moreover the well fire is inexpensive to buy as well as economical in the consumption of fuel, giving out nearly three times as much heat for less than half the coal as compared with ordinarily efficient fires. Well fires are fixed in thousands of important buildings in all parts of the world. The pyramid patent grate is of the barless type, and while remarkably cheap is of high efficiency.

VISIT OF THE GERMAN DELEGATES TO THE EXHIBITION.

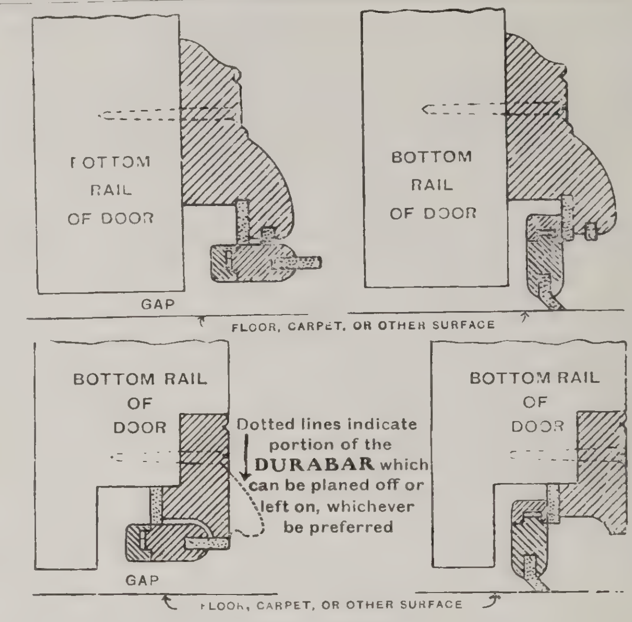
Photo: Topical.

The Zeta Wood Flooring Co., Ltd., Crispin's Wharf, Marshgate Lane, Stratford, E. Stand 85. Row E.

High-class wood-block flooring, on various systems, plain and ornamental, are exemplified at this stand, where also is demonstrated in detail the "Zeta" dowelled system, as supplied by this company to the London County Council.

"Durabar" Draught and Weather Bar. Stand 59. Row D.

At the stand of Mr. James Gibbons, whose exhibits were noticed last week, is shown the "Durabar" combined draught, dust, and noise excluder, and weather bar (Groome's patent), a neat self-acting appliance for stopping the clearance space which must always be allowed beneath doors and casements. The mere act of shutting the door brings the Durabar into action, completely closing the space beneath; while immediately the door is unlatched the Durabar automatically flies up. It is in use in many important buildings, such as the Piccadilly Hotel, London, and has been adopted by the Egyptian Government, and the London and North-Western Railway Co. An illustrated leaflet giving full particulars can be had from The Draught, Dust and Weather Excluder Co., 10, Palace Chambers, Hereford.


BOTTOM RAIL OF DOOR
BOTTOM RAIL OF DOOR
GAP
FLOOR, CARPET, OR OTHER SURFACE
BOTTOM RAIL OF DOOR
Dotted lines indicate portion of the DURABAR which can be planed off or left on, whichever be preferred
BOTTOM RAIL OF DOOR
GAP
FLOOR, CARPET, OR OTHER SURFACE

THE DURABAR DRAUGHT EXCLUDER.

John C. Bonnin and Co., 1, Broad Street Place, Finsbury Circus, E.C. Stand 177. Wall Space.

At this stand is shown the "Silbermann" heating apparatus, for which this firm are the sole agents for the United Kingdom. The "Silbermann" fireplace consists essentially of a closed metallic casing, which is so divided and partitioned as to give the utmost possible radiating surface, while ensuring that the hot air emitted from the apparatus shall be completely sterilised—an invaluable provisions for bedrooms and sick rooms.

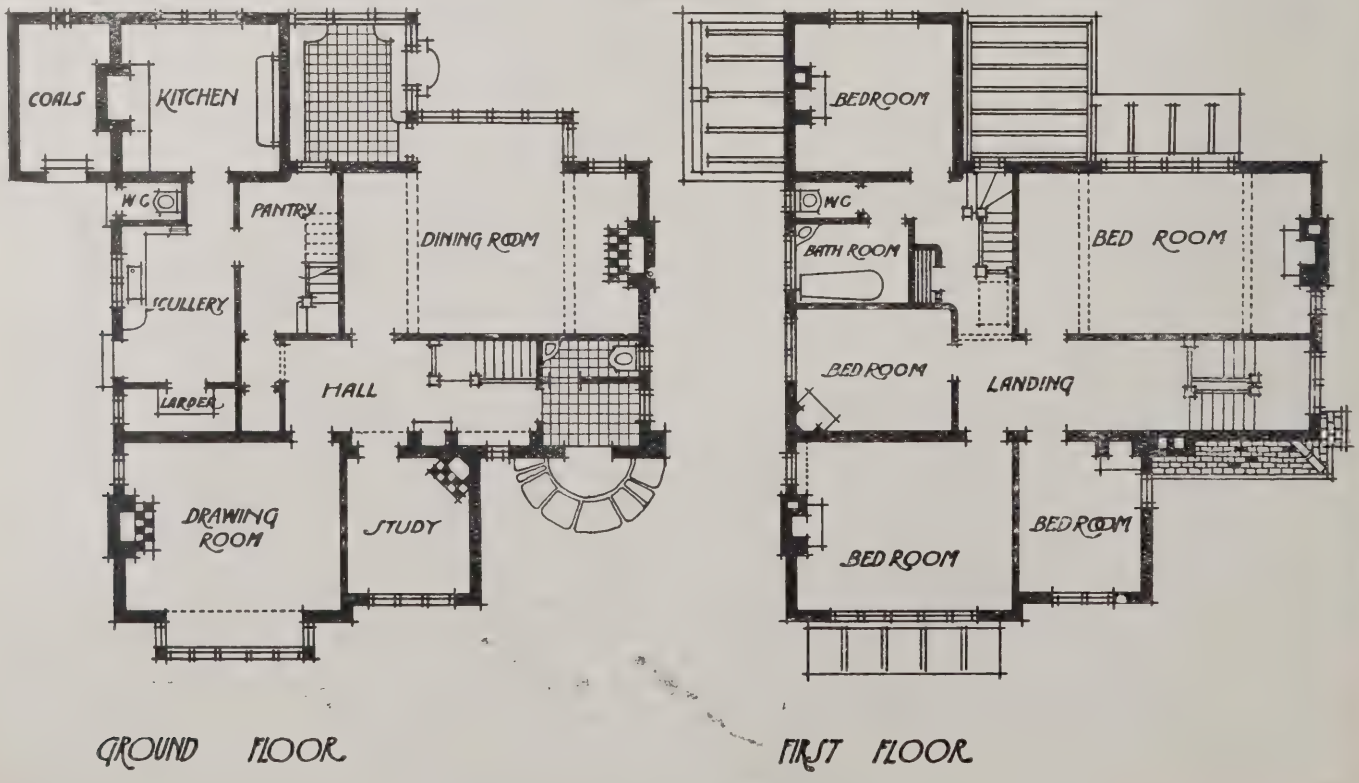
Sam Deards, Victoria Works, Harlow, Essex. London Office: 88, Chancery Lane, E.C. Stand 2. Row B. Gallery.

At this stand is shown "The Superior" patent roof glazing, which is applicable to all kinds of glass roofs, from the smallest daylight to the largest size of roofs of baths, motor garages, railway stations, etc. No screws, putty, paint, or india rubber are used; and the steel bar is entirely covered with pure uniform sheet lead. A special feature is the lead cap, which is separate from the lead covering, and can, therefore, be renewed without damage to the lead-covered bar. Glazing bars cut to length and drilled ready for fixing are supplied to builders, who can thus supply their own glass and labour.

Various boilers are also shown at this stand; where also are to be seen Smale's Patent Cement Block Making Machine, and Smale's Patent Mixing Machine, and the same inventor's patent Cement Block Cutter or Guillotine.

The "Rapid" Block Making Machine has on either side of the table or bench a fall-down press box which forms the mould of the cement block. These are alternately filled with the damp material as it leaves the mixer, and are at once moved to the right or left under the press, when the top plate is brought to bear upon the concrete by the side lever, and upon depressing the foot lever, a most powerful pressure of many tons weight is exerted upon the block, and upon release the box is drawn back, the sides of the mould fall down, the cement block, as pressed, is taken away on its iron plate to the open air to set, when after three days it can be turned and will be ready for use in from 10 to 14 days as required. A lamp keeps the face of the press warm, so that it the more readily leaves the cement and prevents hugging or damage to the face of the blocks; the box being thus done with, the sides and front of same are put together again and recharged. In the meantime, the other box has been filled, and is brought at once under the press as soon as the first one has been removed. Any thickness of block can be made, either for inner walls, partitions, or outside walls, and of any pattern that may be required.

Smale's Patent Mixing Machine mixes the necessary materials to the required degree. The materials are intermixed, first in a dry state, and just before leaving the machine are thoroughly damped and made consistent. The cutting machine consists of two knife edges working in a frame, between which the block is placed. This machine does away with the necessity for using special moulds for corner or angle blocks.



HOUSE AT NEW SOUTHGATE. CASTLE AND WARREN, ARCHITECTS. *(See Centre Plate.)*

Federation Notes.

NORTHERN COUNTIES FEDERATION OF BUILDING TRADE EMPLOYERS.

The quarterly meeting of the Board of Representatives of the Northern Counties Federation was held at the Grand Hotel, Middlesbrough, on Thursday, April 15th, at three o'clock in the afternoon, Mr. J. Davidson (Stockton-on-Tees), president, in the chair.

The president, previous to commencing the ordinary business, congratulated, in the name of the members, the secretary (Mr. W. H. Hope) on the high honour the Poor Law Service had conferred on him by unanimously electing him last month as President of the National Poor Law Officers' Association (Incorporated). Mr. Hope suitably acknowledged the vote of congratulation.

The minutes of the annual general meeting held at Newcastle-on-Tyne, on December 17th, 1908, which had appeared in the "Builders' Journal," were read, and were signed by the president as correct.

The secretary read a letter from the Ivoril Plaster Co., Middlesbrough, inviting the members (after the termination of the business of the Federation) to inspect Messrs. Stewart's new premises, which had been finished throughout with their Ivoril Plaster. The invitation was accepted, and the visit subsequently paid.

The secretary explained that the National form of contract approved by the R.I.B.A., the National Federation, and the London Institute of Builders, had received the careful consideration of this Federation. At the last Executive Council meeting, a special sub-committee was appointed to consider the observations of the local associations upon the use of the form, and any amendments that were desirable, and they recommended that it is undesirable at the present time to seek to disturb the form of agreement now in use. The parties to it had only arrived after very many years' negotiations at the present form, and the proposals for amendment that had been received did not justify their seeking to reopen the question. The agreement, taken generally, was fair, though it still left much to the discretion and determination of the architect that ought to be the subject of review if requested.

The committee further recommended that in any consideration of Clause 30, there should be no extension of the contractor's liability, but that, on the contrary, it should be stated that at the expiry of the maintenance period the building owner should be held to have finally accepted and approved the works, and that the contractor should be absolved from all further responsibility in respect of the works, which is no doubt the intention of Clause 17. Further, that it is undesirable to substitute new words for those of Clause 30, which have already been under judicial review, and have received the interpretation of the Court of Appeal, who were unanimous in stating that the words were quite clear in their meaning (it was the Court below that suggested that there was any doubt in construing the words). The Court of Appeal said, in Robins v. Goddard (1905), C.A., that in view of the arbitration clause the certificate of the architect was not conclusive as to the work and materials and was not to be confined to making good defects, and the fact that it had been issued did not relieve the contractor of any liability. The architect himself is under no legal liability with regard to the issue of his certificate, and the judicial decision does certainly not create one.

That an interpretation is sought to be placed on Clause 27 that, they submit, was never the intention of the parties to the agreement, by taking from the contractor his usual trade profit on goods handled and fixed by him, and for which he is responsible under the terms of the agreement.

That the Administrative Committee be asked to watch the action at law between the South Shields Corporation and Messrs. Niell, with a view to affording all necessary protection to contractors against injury that may be sustained through the arbitrary use of powers conferred by the Clause.

And that the question of prime cost sums be fully considered by the Administrative mittee.

The secretary reported that he had written to the National Secretary in anticipation of the adoption of the report.

After discussion upon the report, on the proposition of Councillor Stephen Easten, seconded by Mr. J. Pelton, it was resolved and carried unanimously—"That the recommendations drawn up and submitted by the sub-committee to this meeting be approved, and that the action of the secretary in communicating the view of this Federation to the National secretary be endorsed, and that the recommendations as they now stand be forwarded to the National Federation for the consideration of the Administrative Committee."

The Executive Council recommended that where representation is claimed by the local associations upon the number of their honorary members, from whom no return is received, "That the same proportion of the local subscription received from the honorary members by the local associations be paid to this Federation in respect of honorary members as in respect of ordinary members." After consideration of the proposition of Councillor Stephen Easten, seconded by Mr. T. Wilkinson, it was resolved:—"That the recommendation of the Executive Council be adopted, and that in future representation shall be upon the total membership, and that payment shall be made to the Federation on both ordinary and honorary members."

The secretary reported that as a result of the applications made to Durham County Council, this authority had drawn up and adopted a form of contract which accepted the principles contended for by this Federation, viz., the reference to arbitration for settlement of all disputes, and that the bills of quantities should be part of the contract; and while the committee were under the impression they had conceded all that the Federation had asked, the draft form had not, in fact, been submitted to them until it was printed and adopted.

Councillor Stephen Easten pointed out that as the contract now stood, it was not all that they desired, but it should be given a fair trial, and the experience of members of its use might be considered after it had been in operation for some time. It was agreed to act on Mr. Easten's suggestion.

As a result of the consideration of a complaint against the conditions of this authority's form, this Federation forwarded a copy of the National form of contract, asking the Council to adopt it for future use.

The Darlington Association had approached this Federation and asked the cost of affiliation with this Federation. This information had been given, and that Association was favourable to joining.

On the proposition of Mr. T. Wilkinson, seconded by Mr. J. Pelton, it was resolved—"That this Federation ask the Darlington Association to ascertain the general feeling of their members by taking a postal vote, and that they be asked to receive a visit at an early meeting from Mr. A. G. White, the National Secretary, if he can make it convenient to attend."

The question of holding a pic-nic during the summer months was raised, and it was decided to refer this to the Executive Council for consideration.

Councillor J. T. Armstrong moved that the Federation hold its next meeting at South Shields, which was agreed to unanimously.

The members, after visiting Messrs. Stewart's premises and being shown over them by Mr. Masters, the president of the Middlesbrough Association, who is the proprietor of the Ivoril Plaster, were subsequently entertained to tea by that Association, to whom a hearty vote of thanks were accorded for their generous hospitality.—W. H. Hope, Secretary.

HULL ASSOCIATION.

Hon. Secretary: A. Peers.

The general monthly meeting of the Hull Association was held at the Builders' Exchange, Posterngate, on Wednesday evening, April 14th, the president, Mr. E. Quibell, being in the chair, and supported by a gratifying attendance of members.

The nomination through the bricklayers' section of Mr. F. Hall for membership was accepted.

The Management Committee's recommendation to pay £15 towards the National reserve fund was carried.

It was decided that an outing in connection with the association be held on Wednesday, June 30th, to Harrogate, Knaresborough, and Pately Bridge, the arrangements to be left in the hands of the Management Committee.

The question of alteration in the rules of the association was introduced, but it was decided that no improvement be taken in the matter at present. A draft was approved of a "workshops notice" to notify the employees officially of the closing of works and shops for the week of August Bank Holiday, it having previously been decided to observe that week as a general holiday throughout the building trades of Hull.

It is expected that this arrangement will meet with approval and appreciation from all concerned.

Other matters arising produced considerable discussion, bringing out many interesting and useful points.

YORKSHIRE FEDERATION.

The monthly meeting of the Executive Council of the Yorkshire Federation was held at the Exchange Hall, Town Hall, Dewsbury on Thursday, April 15th. Mr. A. J. Forsdike (junior vice-president) occupied the chair, and twenty delegates were present from affiliated associations. The minutes of the preceding meeting were read and approved. Apologies for absence having been reported from the president (Mr. W. R. Thompson) and other members, Mr. Forsdike referred to the unfortunate absence of the president through illness, and moved that the sincere sympathy of the Federation be tendered to the president, with an expression of the earnest hope that he will have a speedy and complete recovery. This was seconded by Mr. S. Coop, president of the Dewsbury Association, and carried unanimously. A resolution was also unanimously passed, on the motion of Mr. W. T. Ledgard, seconded by Mr. H. Fallas, conveying the Federation's cordial sympathy to Mr. A. Mastin, of Sheffield, coupled with an expression of their great pleasure in hearing that he is making a favourable recovery.

The treasurer reported receipt of subscription of £30 from the Sheffield Association.

The minutes of the Finance and Emergency Committee were read and considered in detail. The Emergency Committee reported that the documents in the York case had been carefully considered, and that they had generally approved the draft case to be submitted for opinion of counsel. The secretary had been instructed to approach a Leeds solicitor, and arrangements were made for an inspection of the premises with a view to expert evidence being given if necessary. Subsequent developments, however, having been considered, it was resolved, on the motion of Alderman W. H. Jessop, J.P., seconded by Mr. J. Townsley, to inform the National Administrative Committee of the present position, and invite them to state whether they still desire the Federation to take counsel's opinion of the general position of a contractor in relation to the architect, proprietor, and sub-contractor, especially in cases where certain specialities or defined sources for purchases of materials are expressly selected by the architect.

An amended form of sub-contract was submitted by the Finance and Emergency Committee. After discussion and amendment it was resolved, on the motion of Mr. J. T. Levitt, seconded by Mr. W. Robinson, that the form as now amended be approved.

The Finance and Emergency Committee reported that they had carefully considered the reciprocal relations of members under the inter-trading rule, and suggested regulations for the governance of the rule. On the motion of the chairman, seconded by Mr. H. Fallas, it was resolved that the draft regulations be referred to the local associations for their consideration and written observations. It was reported that the Hull Association had made several suggestions for amendment of the approved form of contract. It was resolved, on the motion of Mr. W. T. Ledgard, seconded by Mr. J. T. Levitt, to forward these suggestions to the National Administrative Committee for their consideration in connection with any others submitted to them. It was reported that the Bradford, Dewsbury, Hull, Sheffield, and Wakefield Associations had agreed to purchase a number of copies of the Federation Directory, on preferential terms, for distribution among their members. Members were reminded of the Building Trades Exhibition to be held at Olympia from April 17th to May 1st, and especially of the official visit arranged for Tuesday, April 20th, at 6 p.m. (An account of this visit appears on another page.)

The minutes of the Northern Centre Conciliation Board and the March report of the Lancashire, Cheshire, and North Wales Federations, were read.

It was reported that the York Local Conciliation Board had unanimously voted in favour of the Masters' Notice fixing the radius in which the working and Conciliation rules apply.

Alderman W. H. Jessop, J.P., kindly stated that he would endeavour to see the West Riding Architect at an early date, and ascertain his decision with respect to the use and recognition of the National form of contract.

Members were reminded that the annual meetings of conciliation boards should be arranged as early in May as possible, in order to permit of any appeals which may be made from the decision of a local conciliation board being heard by the Northern Centre Board at their annual meeting.

The arrangements for the next meeting were left in the hands of the president and secretary.

The representatives were entertained to tea by the president and members of the Dewsbury Association, to whom a hearty vote of thanks was accorded for their generous hospitality.—J. Davidson.

SHEFFIELD ASSOCIATION.

Secretary: Thos. Smith.

In the Sheffield Association report on page 331 of the issue of this journal dated April 14th, the word "not" was accidentally omitted from a passage occurring in the last line of the page. The reference was to an understanding with the Sheffield City Council and City Police in regard to the question of builders' hoardings. It should have appeared that the association "had been met very considerately by the Council, who had informed them that it was *not* their intention to require a close-boarded hoarding in suburban positions where there was a minimum of traffic," etc.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

The March monthly meeting of Barnsley Federation of Building Trades Employers was held under the presidency of Councillor G. Haigh, who was supported by twelve members.

The report of the last Yorkshire meeting was submitted by the senior vice-president, Mr. E. Broley. An animated discussion took place on the proposed certificate to be signed by workmen before entering any employment in the building trades. Ultimately it was resolved that the secretary should write to the secretary of the Yorkshire Federation for information as to whether the insurance companies were the originators of the proposal, or whether the scheme was formulated by the National.

Messrs. Bentley and Kaye, stone merchants, Rastick, Yorkshire, were unanimously elected hon. members of the Federation.

A very lengthy and animated discussion again took place, re the proposed adoption of the intertrading rule, upon which the opinions of the different speakers were sharply divided. A slight majority of the members declared that the Barnsley rule bearing on this vexed question was quite good enough, if only the members would interpret the rule in its proper form and loyally abide by it. The stumbling block of the Barnsley rule appears to be the phrase "where possible," which undoubtedly gives a wide and practically unlimited scope as regards the letting of contracts to others than members of the Federation. Nothing definite was settled, and the much discussed intertrading rule will receive the further attention of the members at their next monthly meeting.

WAKEFIELD ASSOCIATION.

Secretary: J. Beaumont.

A meeting of the members of the Wakefield and District Association was held at the Bull Hotel, Wakefield, on Thursday evening, April 1st, Mr. Tom Lee (president) in the chair. Mr. Henry Fallas warmly thanked the members for the vote of sympathy with him in his illness, passed at the last meeting, and expressed his pleasure at being again well enough to attend the meetings of the Association.

The members of the local Conciliation Board of Building Trades representing the employers were elected as follows: Alderman Judge, Mr. George Crook, Mr. Tom Lee, Mr. D. F. Parker, Mr. H. Fallas, and Mr. J. Pashley. A communication from the secretary of the Yorkshire Federation of Building Trades Employers was read, asking for the observations and recommendations of the Association on several questions under the consideration of the Federation, including the National form of contract, certificates of employment, sub-contracts, and intertrading, and the president (Mr. Lee) and Mr. H. Fallas, who had recently attended a meeting of the Federation at Huddersfield, made a report on these matters. Messrs. E. A. Elvey, G. Crook, J. Pashley, C. H. Prince, J. Slack and A. Martin joined in the discussion on the questions raised, and the representatives of the Association were directed to lay the views of the members before the members of the Federation at the next meeting. On the motion of the president, seconded by Mr. Crook, it was decided to apply to the Federation for a sufficient number of copies of the Official Directory to enable each member to be supplied with a copy.

Coming Events.

Wednesday, April 27.

Quantity Surveyors' Association, Caxton House, Westminster.—Meeting in Chinese Salon of the Holborn Restaurant.—Mr. Maurice Kahn on "Reinforced Concrete, Design, Quantities, and Practice." 7 p.m.

Saturday, May 1.

Junior Institution of Engineers.—Twenty-fifth Anniversary Dinner at the Hotel Cecil, 7 for 7.30 p.m., the President, Mr. James Swinburne, F.R.S., in the chair. Mr. R. B. Haldane, P.C., M.P., Secretary of State for War, as guest of the evening.

Thursday, May 13.

Paint and Varnish Society, St. Bride's Institute, London, E.C.—Mr. J. Cruickshank-Smith, B.Sc., on "The Physics of a Pigment." 8 p.m.

Saturday, May 15.

Edinburgh Architectural Association, 117, George Street.—Visit to Borthwick Castle and Church.

Monday, May 17.

Royal Institute of British Architects, 9, Conduit Street, W.—Sir W. B. Richmond on "Smoke Abatement." 8 p.m.

Thursday, May 27.

Society of Architects, Staple Inn Buildings, Holborn, E.C.—Whitsuntide Excursion to Kent.

Insurance.

Free £500 Accident Insurance Coupons have been sent to the following:

J. J. S. (Ulverston), J. M. (Galston), H. W. (Plumstead), W. F. (Derby), H. C. (Halifax), A. A. C. (Clapham Common), J. W. H. (Nantwich), W. E. G. (Aberdeen), F. C. G. (Preston), S. B. (Cardiff), J. A. J. (Llanelly), A. M. (Prestwich), B. C. W. (Nottingham), W. A. S. (Nottingham), E. W. (West Hampstead), V. A. S. (Kilburn), L. K. S. (Egremont), A. W. D. (Bournemouth), J. J. (Blaenau Festiniog), E. S. (Taunton), J. B. K. (Hull), E. S. B. (Chesham), J. C. (Macclesfield), G. N. (Chertsey), W. B. C. (Muswell Hill).

TANK ROOF TO FACTORY 190 ft. by 57 ft.

The Chain Concrete Syndicate.

Constructional Engineers in Reinforced Concrete. . .

The most complete system in existence.
Every Member, Tension or Shear, RIGIDLY FIXED.
No Loose Bars to be misplaced during Concreting.

Fireproof Floors, Flat Roofs, Reservoirs, Culverts, Bridges,

Write for Pamphlet—

1, Basinghall Square, LEEDS, and Carlton Street, CASTLEFORD.

ARE YOU VISITING THE GREAT

Offices : 43, Essex Street, Strand, W.C.

H. GREVILLE MONTGOMERY, M.P. } Promoters.
H. C. MONTGOMERY. }

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are a follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application.

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER, S.W.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Dartmouth.—For the demolition of and rebuilding Stapledon House, for the Trustees of St. Petrox Trust Lands, Dartmouth:—

Wilkins and Sons, Bristol	£1,364	0	0
Bovey an dSon, Torquay	1,297	0	0
Ferris and Heydon	1,144	0	0
R. C. Pillar	1,110	0	0
F. Stanbury, Plymouth	1,097	0	0
S. Roberts, Ltd., Plymouth	1,095	0	0
R. T. Pillar	1,095	0	0
H. Anderson	1,075	0	0
Triggs and Watts	1,072	0	0
J. Back*	984	0	0

*Accepted

Rest of Milford Haven.

Hinckley.—For the erection of public baths, Station Road, Hinckley. Mr. E. H. Crump, A.M.I.C.E., engineer and surveyor:—

Moss and Sons, Loughborough	£2,592	15	0
A. E. Palmer, Leicester	2,589	1	4
A. Faulks, Loughborough	2,569	12	6
Kelly and Sons, Coventry	2,562	4	9
J. Dallow and Sons, Blackheath	2,532	0	0
W. Flavell, Hinckley	2,224	12	6
A. Jewell, Market Harborough	2,413	7	6
W. Sharp, Leicester	2,409	17	7
T. Hickmon, Market Harborough	2,392	17	9
Goodman and Sons, Hinckley	2,388	17	9
S. Chaplin, Stoke Golding	2,377	9	0
T. Rowley, Hinckley	2,365	17	2
G. Greaves,* Hinckley	2,348	11	0
E. Fox, Leicester	2,324	7	10

*Accepted.

Hinckley.—For the engineering work in connection with the public baths, Station Road, Hinckley. Mr. E. H. Crump, A.M.I.C.E., engineer:—

T. Smith and Co., Leicester	£646	0	0
Moorwood and Co., London	602	0	0
Ashwell and Nesbitt, Leicester	513	0	0
The Brightside Foundry Co., Birmingham	499	0	0
Gimson and Co., Leicester	474	0	0
	(incomplete)		
W. E. Freer, Leicester	463	0	0
T. Bradford and Co.,* Salford	460	10	0

*Accepted.

Milford Haven.—For the erection of a shop and additions to stores on the Docks, Milford Haven. Mr. C. Launcelot Blethyn, architect, Milford Haven:—

Cole and Sons	£890	0	0
Henry Adams	885	6	0
S. Scott	826	10	0
F. Lloyd and Co.	794	0	0
A. Heatherley and Co.	760	0	0
Hayward and Wooster,* Bath	697	0	0

*Accepted.

Nuneaton.—For the erection of a public slaughter-house in St. Mary's Road, for the Corporation. Mr. F. C. Cook, Borough Surveyor, Council Offices, Nuneaton:—

T. Higgs	£1,544	0	0
Kelly and Sons	1,430	0	0
A. Bedingham	1,356	0	0
G. E. and W. Wincott	1,354	0	0
A. Jewell	1,342	0	0
T. Hickman,* Market Harborough	1,247	9	3

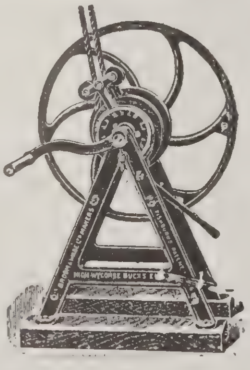
*Accepted.

Pontnewydd.—For the erection of new business premises, hall, bakehouse, and stable, for the Co-operative Society, Ltd. Mr. A. E. Sheppard, architect and surveyor, 39, High Street, Newport. Quantities by architect:—

Powell Bros.	£2,657	12	6
J. Charles	2,300	0	0
P. H. Saunders	2,300	0	0
Phillips and Clarke	2,295	0	0
Greenway and Son	2,200	0	0
G. F. Leadbeter	2,175	0	0
G. Edwards	2,169	0	0
C. H. Read	2,150	0	0
E. F. King and Co.	2,128	0	0
J. H. Williams	2,127	0	0
T. Jerrett	2,120	0	0
H. N. Case	2,118	0	0
T. J. Hill	2,110	0	0
H. Williams and Co.	2,102	8	10
A. S. Morgan	2,099	0	0
J. N. Morgan	2,070	0	0
R. Partridge	2,000	0	0
Poulton and Whiting,* Pontnewydd	1,946	0	0

*Accepted.

(*Tenders continued on page viii.*)



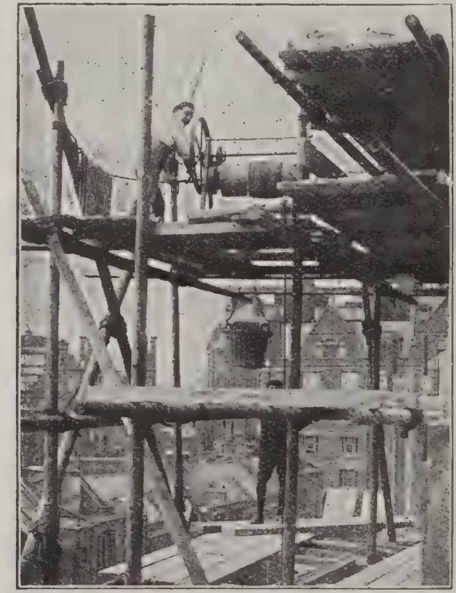
Reduce your Wages by using
BROOM & WADE'S
PATENT HOIST.

This is the most Efficient Hoist on the market for hoisting barrows of bricks, concrete, &c., without Gearing.

BROOM & WADE, LTD.,
Engineers, HIGH WYCOMBE.
SEE OUR STAND No. 209 OLYMPIA.

LIFTS, CRANES, CRABS
REVOLVING SHUTTERS,
COLLAPSIBLE GATES,
SLIDING PARTITIONS.
DENNISON, KETT & Co., Ltd.,
II, Queen Victoria Street, LONDON, E.C.
Iron Staircases, Doors and Sashes.
CATALOGUE FREE ON APPLICATION.
Telegrams: "Hoisters, London." Telephone, Bank 8356. A B C Code.

STACEY'S
PATENT
WINCHES.
TIME AND LABOUR SAVED.
Builders, Contractors, Fireproof Building Constructors, etc., can effect a saving of 50 per cent. in labour by the use of these Winches.



In use and used on
Royal Mail Offices, Kingston, Jamaica.
New Mills, Elland, Yorkshire.
New Works, Entent, Singapore.
Salvation Army Shelter, Blackfriars Road, London, S.E.
Prospect Works, Sheaf Street, Leeds.
New Church, Durham Rd., Cottenham Park, Wimbledon.
New Schools, Llandudno.
Western Valley Sewers, Newport, Mon.
And numerous other buildings in London and the Provinces.

WITH BRAKE. WORKED BY ONE MAN.
Can be worked in any position. A large number in use. Always in Stock.
Send for Illustrated Circular.
G. STACEY & CO.,
66, Lorrimore Rd., WALWORTH, LONDON S.E.

WAYGOOD

LIFTS

MESSRS. R. WAYGOOD & Co., Ltd., have the honour to invite your inspection of their special installation at the Building Exhibition, Stall No. 58, Row D.

AT THE

Building Exhibition,

OLYMPIA.

(Tenders continued from page vii.)

Pontypridd.—For the erection of three shops, with offices over, at Mill Street. Messrs. A. O. Evans, Williams, and Evans, architects, Pontypridd. Quantities by architects:—

Knox and Wells	£2,477
S. Shail	2,398
W. Williams	2,290
W. Griffiths	2,255
A. J. Colbarai	2,143
W. Thomas and Co.	2,099
E. Jones	2,098
L. Davies	2,059
Williams and James	2,050
Neblett and Davies	2,050
R. Jones	2,005
E. R. Evans Bros.,* Cardiff	2,018

*Accepted.

Ryhope.—For the erection of St. Patrick's Presbytery, for Rev. E. McGarrity. Mr. J. Spain, A.R.I.B.A., 12, John Street, Sunderland:—

Morrison Nicholson	£1,090	0	0
H. Hirton	979	3	6
W. White	880	0	0
J. Armitage	875	0	0
W. Allison	867	10	0
R. Brown	864	10	0
A. Wilkinson	860	0	0
J. Clark	857	10	0
J. Huntley	852	13	0
Clercy and Charlton	849	0	0
D. and J. Ranken	849	0	0
R. Stafford	830	0	0
W. B. Cooper	825	0	0
J. Elrick	818	0	0
J. Taylor	810	0	0
H. Pitt	792	0	0
J. and G. Parker,* 146, Hastings Street, Hendon, Sunderland	780	0	0

*Accepted.

Stevenage, Herts.—For the erection of dwelling-house, bakehouse, stables, mealhouse, etc., for Mr. F. Gray. Mr. J. Shilcock, architect, Hitchin, Herts:—

T. A. Reavall	£998	0	0
F. Newton	963	0	0
J. S. Launder	947	0	0
Willmott and Sons	939	0	0
Austin and Sons	929	5	0
E. J. Dearmon	896	15	0
F. J. Bailey and Co., Ltd.	859	0	0
Shrouder and Matthews,* Stevenage	827	0	0

*Accepted.

Truro.—Accepted for alterations and restoration of the Old Miner's Bank, Truro, for Coulter Hancock, Esq., solicitor and official receiver, Truro. Mr. A. Ernest Harris, architect, Truro:—

C. and J. Harris, builders; W. J. Tippett, painter; Val de Travers, asphalt.

Newbold Verdon.—For erecting an elementary school, etc., to accommodate 140 children, for the Leicestershire County Council Education Committee. Mr. E. G. Fowler, architect, County Education Office, Leicester. Quantities by the architect:—

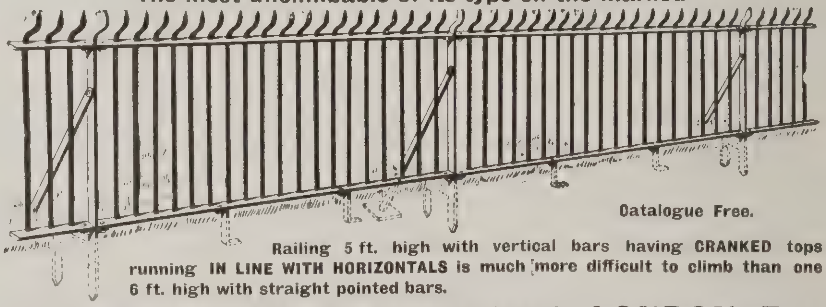
W. F. Harding, Loughborough	£1,810	18	0
G. L. Martin, 10, Goward Street, Market Harborough	1,756	0	0
King and Ridley, Bitteswell Road, Lutterworth	1,748	0	0
A. Faulks, Sparrow Hill, Loughborough	1,748	0	0
A. J. Wileman, Queen's Road, Loughborough	1,738	0	0
A. B. Moss, Coalville	1,732	15	0
H. H. Garlick, Mowsley, Rugby	1,718	0	0
B. Shipman, Main Street, Ratby	1,717	17	0
E. Haycock and Sons, Great Glenn	1,700	0	0
P. Rourke, Market Street, Lutterworth	1,685	0	0
Griffin Bros., Hugglescote	1,675	10	0
J. Chapman, Rutland Avenue, Leicester	1,649	0	0
J. Cole and Sons, Bridge Road Works, Leicester	1,640	1	6
F. Oldershaw, Canal Street, South Wigston	1,638	0	0
W. Potter, Blaby	1,632	9	9
E. W. Garlick, 149, Uppingham Road, Leicester	1,628	10	0
E. Fox, 6, Evington Street, Leicester	1,618	10	0
F. Sleath,* Rothley	1,557	10	0

*Accepted.

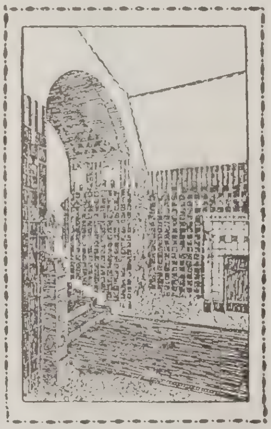
W.C. CISTERNS.
Best Cistern on Earth. Used in the Best Work.
Inexpensive. Sensitive. Frost Proof.
Always Fills. Silent. Quick Filling.
HOLT'S PATENTS, 3, Smithfield St., Liverpool.

LIGHTNING CONDUCTORS
Supplied, Erected and Tested. Chimney Shafts Restored, &c.
J. LEWIS, 5 & 6, Great Winchester Street, LONDON, E.C.
TELEPHONE No. 3053 CENTRAL.

BAYLISS, JONES & BAYLISS LTD.,
THE "CRANKED BAR" RAILING.
The most unclimbable of its type on the market.



Catalogue Free.
Railing 5 ft. high with vertical bars having CRANKED tops running IN LINE WITH HORIZONTALS is much more difficult to climb than one 6 ft. high with straight pointed bars.
WOLVERHAMPTON & CANNON STREET, LONDON, E.C.



"Modernia" Patent Glass Tiles
give an artistic and novel effect.
No glassy surface. Coloured throughout. Substance about ¼ inch. Any colour supplied. Prospectus, Samples, Estimates and Designs for complete decorations, free.
The "Modernia" Patent Glass Tile Co.
Sole Concessionaires: Aug. Brennecke & Co., 68, Finsbury Pavement, London, E.C.
STAND 18B, BUILDING TRADES EXHIBITION, OLYMPIA.

PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART
TELEPHONE No 9492 Central
MEASURES BROS LTD 53B SOUTHWARK ST. LONDON S.E. & PITLAKE, CROYDON.
TELEPHONE No. 171 CROYDON.
10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.
SECTION SHEETS, BOOKS & PRICES ON APPLICATION.
CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.
STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock.

COMPLETE LIST OF CONTRACTS OPEN.

With a few exceptions, items of Contracts Open are not repeated after they have been published once in these columns, so that readers will find particulars in our previous issues of other contracts that still remain open.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

April 30. HORSHAM.—Erection of the school hall at the Grammar School. Applications to be made to the architects to the governors, Frederick Wheeler and Godman, Bank Chambers, Horsham, where drawings, specification, and conditions of contract can be seen by April 30.

May 3. LLANTWIT FARDRE (Wales).—Erection of a porter's lodge at the isolation hospital, near Tonteg, Llantwit Fardre, for the Pontypridd U.D.C. Plans and specification and form of tender at the office of W. E. Lowe, surveyor to the council. Tenders, endorsed "Porter's Lodge," to J. Colenso Jones, clerk, Municipal Buildings, Pontypridd, by May 3.

May 3. PONTEFRACT.—Erection and completion of shop and house, Horse-fair, Pontefract, for the Pontefract Almshouse Charities. Plans, specifications, sections, etc., and all information of James Heseltine, architect and surveyor, Old Castle Drawing Office, Pontefract, to whom tenders are to be sent by May 3.

May 5. ARMLEY.—Bricklayer, and masons, carpenter and joiners, plumber and glaziers, plasterers, painters, slaters, ironfounders, and concreters' work in re-building the Royal Hotel, licensed premises to the new street improvement line, in Town Street, Armley, for the proprietors, J. R. Holmes and Son, The Brewery, Bingley. Names to Thomas Winn and Sons, architects, 84, Albion Street, Leeds, by May 5.

May 5. BROUGHTY FERRY (near DUNDEE).—Reconstruction and enlargement of the lifeboat house and the construction of a new slipway at Broughty Ferry, near Dundee, for the committee of management of the Royal National Lifeboat Institution. Plans and specifications on application to Jas. Hunter, jun., 63, Reform Street, Dundee, or at the office of W. T. Douglas, M.Inst.C.E., 15, Victoria Street, Westminster, London, S.W. Bills of quantities and form of tender on application to the engineer and architect, accompanied by deposit of £1. Copies of certain of the plans at a cost of 3s., non-returnable. Tenders, endorsed "Tender for Broughty Ferry Lifeboat Station," by noon on May 5, to Charles Dibdin, secretary, 22, Charing Cross Road, London, W.C.

May 6. ST. ABBS' STATION (Berwickshire, N.B.—Construction of a lifeboat slipway and store-house at St. Abbs', in the parish of Coldingham, for the committee of management of the Royal National Lifeboat Institution. Plans, etc., on application to the local hon. secretary, Miss Hay, St. Abbs' Haven, Berwickshire, or at the office of the engineer and architect, W. T. Douglass, M.Inst.C.E., 15, Victoria Street, Westminster, London, S.W. Copies of the bills of quantities, etc., on application to the engineer and architect, accompanied by deposit of £1. Copies of certain of the plans will be supplied by the engineer and architect for 3s. (not returnable). Tenders by May 6.

May 6. BIRMINGHAM.—Erection of new cells, etc., at the police station, Ladywood Road, for the Corporation. Drawings and specification, and quantities and forms of tender, of Henry E. Stilgoe, M.Inst.C.E., city engineer and surveyor, the Council House, Birmingham, on deposit of £3 3s. Tenders, endorsed "Tender for New Cells, Ladywood Police Station," addressed to the chairman of the Watch Committee, at the office of the engineer and surveyor, by May 6. Fair wages clause

May 7. CARLISLE.—Taking down the whole of the erections at Devonshire Park Ground, Catholic Lane, and the re-erection of same at Brunton Park Ground, situate off Warwick Road, Carlisle, for the Carlisle United Association Football Club, Ltd. Plans and specifications at 54, Lowther Street, Carlisle. Tenders to be sent by 3 p.m. on May 7, to H. Foxall, architect, Carlisle.

May 8. FALMOUTH.—Additions and alterations at the Falmouth county high school, for the Cornwall education committee, according to plans and specifications which may be seen by appointment at the borough surveyor's office, Municipal Buildings, Falmouth, or at the office of Sampson Hill, architect to the committee, Green Lane, Redruth, from whom all particulars may be obtained. Forms may be obtained at the borough surveyor's office, or from the architect. Tenders to be sent to F. R. Pascoe, secretary, education office, Truro, by May 8.

May 8. CAMBORNE (Cornwall).—Addition to the Basset Road, Camborne, council school, for the Cornwall education committee, according to plans and specification which may be seen by appointment at the office of Sampson Hill, architect to the committee, Green Lane, Redruth, from whom all particulars may be obtained. Forms may be obtained from the architect. Tenders to be sent to F. R. Pascoe, secretary, education office, Truro, by May 8.

May 8. NEWQUAY (CORNWALL).—Erection of a school at Newquay for the education committee. Plans and specifications at the office of B. C. Andrew, architect to the committee, Biddicks Court, St. Austell, from whom all particulars may be obtained. Tenders by May 8, to F. R. Pascoe, secretary, education office, Truro.

May 8. HALIFAX.—Alterations at Raglan Street dyeworks for Fletcher Brothers. Plans, etc., and quantities at the office of Chas. F. L. Horsfall and Son, architects, Lord Street Chambers. Tenders to be sent in by May 8.

May 10. CHELMSFORD.—Demolition of existing buildings on the site of 83, High Street, and construction of a public convenience on part of such site, for the corporation. Specifications, bills of quantities, forms of tender, and full particulars on deposit of £1 1s., and plan inspected at the borough surveyor's office, 16, London Road. Tenders, endorsed "Public Convenience," by 4 p.m. on May 10, to W. Smith, town clerk, Municipal Offices, 16, London Road, Chelmsford.

May 10. BELFAST.—Erection of additional buildings on the Purdysburn Estate for the Corporation. Plans and specifications of the architects, Graeme-Watt and Tulloch, 77a, Victoria Street, Belfast. Bills of quantities and form of tender on application to A. Ferguson, quantity surveyor, Scottish Provident Buildings, on deposit of £4 4s. Tenders, endorsed "Tender for Asylum Buildings," by 2 p.m. on May 10 to R. Meyer, town clerk, pro tem.

May 12. ENFIELD, Middlesex.—Erection of a public library on land adjoining the Hertford Road, Enfield Highway, for the U.D.C. Drawings and specification, bills of quantities (prepared by Young and Brown, 104, High Holborn), and all information on application to Richard Collins, the council's surveyor, on deposit with the clerk of £2 2s. Tenders, endorsed "Tender for Public Library," by noon on May 12, to T. W. Scott, clerk to the council, public offices, Enfield, Middlesex.

May 17. SOUTHAMPTON.—Erection of a block of buildings containing fifty-one office and storerooms, etc., mostly flint-faced with stone dressings. Bill of quantities on deposit of £10 10s. Tenders to be endorsed "New County Offices." 2. Construction of about 2,000 sq. yds. of Hennibique concrete flooring in the new building. Plans, sections, and specification on deposit of £2 2s. All other necessary information on application to the office of W. J. Taylor, county surveyor, the Castle, Winchester, on and after May 1st. Tenders must be endorsed "Concrete Floors." Deposits must be made by cheque, payable to the Hants County Council, and crossed Bank of England. Tenders by 10 a.m. on May 17, to H. Barber, clerk to the C.C., The Castle, Winchester.

May 18. DURHAM.—Erection of Council schools at Haverton Hill and Dunston, and alterations at Washington Biddice Council school, for the C.C. Plans, specifications, and general conditions of contract, and bills of quantities, as follows:—Haverton Hill school (for about 900 children), at the office of W. Rushworth, Shire Hall, Durham. Dunstan (Glebe Estate) council school (for about 800 children), at the office of J. Potts and Sons, architects, 57, John Street, Sunderland. Washington Biddick council school (plans and specification only), at the office of F. E. Coates, Shire Hall, Durham. Tenders, endorsed with name of school, by May 18, to A. J. Dawson, clerk to the education committee, Shire Hall, Durham.

No date. HARROGATE.—Execution of masons, joiners, plasterers, plumbers, slaters, and painters work in extensions to the Royal Baths. Names to be sent to F. Bagshaw, borough engineer, Harrogate. Quantities will be forwarded on deposit of £1.

No date. ABERYSTWYTH.—Execution of paving work at the New Quay school, for the Cardiganshire education committee. Full particulars may be obtained of the head master, or at the office of Geo. Dickens-Lewis, county architect, Aberystwyth.

No date. WITHERNSEA.—Erection of a large skating rink and recreation hall, with other buildings, at Withernsea, for the Pleasure Gardens Company, Ltd. Names and addresses to Freeman, Son, and Gaskell, architects and surveyors, Albert Chambers, 11, Carr Lane, who will forward all particulars.

ENGINEERING.

May 4. MANCHESTER.—Supply and delivery of one 40 to 45 b.h.p. chassis, for use as motor tower waggon, for the tramways committee. Forms of tender and general conditions on application to J. M. M'Elroy, general manager, tramways department, 55, Piccadilly, Manchester. Tenders to the chairman of the tramways committee, 55, Piccadilly, Manchester, endorsed "Tender for Chassis," by 10 a.m. on May 4.

May 6. ROTHERHAM.—Execution of (1) hot-water heating; (2) ventilating; (3) plumbing work, at municipal high school for girls, for the education committee. Plans, etc., at the offices of the architects, Holdgate and Harrison, 9, Gray's Inn Square, London, or the education offices, Imperial Buildings, Rotherham.

May 6. ALDERSHOT.—Fitting up hot-water apparatus, as per plan and specification, on application to the caretaker. Tenders (marked on outside "Tender for Hot Water") to be delivered to caretaker, addressed to secretary, by May 6.

May 8. ECCLES.—Supply and erection complete of (1) one two-crank inverted compound condensing engine (enclosed type), and (2) two 10in. centrifugal pumps, with appurtenant work, required at the sewage disposal works, for the corporation. Drawings and specification and bill of quantities from G. W. Willis, sewage works engineer, sewage works, Peel Green Road, Patricroft, on deposit of £2 2s. Tenders, endorsed "Tender for Engine-Pumps," to be delivered by 10 a.m. on May 8, to Edwin Parkes, town clerk, town hall, Eccles. Fair wages clause.

May 10. TIREE.—Erection of a reinforced concrete steamboat pier (Hennibique system), also for the breakwater and slip to be constructed in Gott Bay, Tiree, for the harbour trustees. Plans, etc., and schedules of quantities on deposit of £2 2s., from the engineer at Oban, or from the engineer to the Secretary for Scotland, W. G. Coles, at 122, George Street, Edinburgh.

May 22. CHWILOG (Carnarvonshire). — Providing and fixing corrugated iron hay sheds at Ynysgoch and Cefnbronmiod Farms, near Chwilog, Carnarvonshire. Copies of specifications at the office of J. Henry Thomas, agent, Dr. Lewis Charity, 14, Market Street, Carnarvon, to whom tenders, endorsed "Tender for Hay Sheds," are to be sent by May 22.

IRON AND STEEL.

May 4. LONDON (for Madras).—Supplying steel rails and fishplates, as per specifications, which may be seen at the offices of the company, for the board of directors of the Madras and Southern Mahratta Railway Company, Ltd. Tenders marked "Tender for Steel Rails and Fishplates," by noon on May 4, to H. Bonham-Carter, secretary, offices, 91, York Street, Westminster, S.W. £1 1s. for specification (not returnable).

May 4. LONDON, S.W.—Supply and delivery of about 4,000 tons of steel-girder tramway-track rails and fastenings, and about 3,000 tons of slot rails and conductor tees, for the L.C.C. Supply and delivery of track rails, etc., and of slot rails and conductor tees, under two separate contracts. Drawings, specifications, bills of quantities, forms of tender, and other particulars on application to the chief engineer of the council, Maurice Fitzmaurice, C.M.G., county hall, Spring Gardens, S.W., upon deposit with the cashier to the council of £2 for each contract. Tenders at the county hall, addressed to the clerk of the L.C.C., Spring Gardens, S.W., and marked "Tender for Track Rails and Fastenings, L.C.C. Tramways," or "Tender for Slot Rails and Conductor Tees, L.C.C. Tramways," by 11 a.m. on May 4. Fair wages clause.

May 6. SWANSEA.—Supply of wrought iron unclimbable fencing for the enclosing of the Promenade Gardens at the Mayhill Estate, for the corporation. Full particulars and form of tender from Marcus Hoskins, F.S.I., borough estate agent, Coleridge House, Swansea. Tenders to J. Thomas, town clerk, Guildhall, Swansea, by May 6, endorsed "Tender for Iron Fencing."

May 11. MANCHESTER.—Supply of about 18,500 tons of cast-iron pipes and special castings, 40 inches diameter, for the corporation. Specification and form of tender on application to G. H. Hill and Sons, civil engineers, Albert Chambers, Albert Square, Manchester, and 3, Victoria Street, Westminster, upon receipt of deposit, £2 2s. (cheque). Tenders, endorsed "Thirlmere Aqueduct, Contract No. 5, Tender for Cast-Iron Pipes," addressed to the chairman of the waterworks committee, must be forwarded to the secretary, waterworks offices, town hall, Manchester, by May 11.

PAINTING.

May 1. YORK.—Painting and limewhiting, at certain schools during the summer holidays, for the York education committee. Specifications from J. H. Mason, secretary, education offices, Clifford Street, York. Separate tenders for each school to be painted, and one tender for the whole of the limewhiting. Tenders must be sent in, endorsed, "Tender for Painting," by May 1, to the secretary.

May 4. RICHMOND, Dublin.—Painting the external woodwork and ironwork of Portrane branch asylum for Joint Committee of the Richmond district lunatic asylum. Specification by the resident engineer, S. J. McClure, which may be inspected at his office, at the Portrane branch asylum, Donabate, Co. Dublin. Tender by May 4.

May 12. DURHAM.—Painting, colouring, etc., at the undermentioned council schools during the midsummer vacation, for the C.C., Browney Colliery, Waterhouses, Esh Winning, Ushaw Moor, Hedley Hill, Kimblesworth, Nettlesworth, Littletown, Sherburn Hill, Bearpark, Brasside, Framwellgate Moor, and North Brancepeth (Cookery Centre). Specifications and form of tender from Edwin Potts, district clerk, 19, The Avenue, Durham, to whom tenders are to be sent by 10 a.m. on May 12.

No date. ABERYSTWYTH.—Execution of painting work at the school at Yspytty Ystwyth, for the Cardiganshire education committee. Full particulars can be obtained from the headmaster or at the office of Geo. Dickens-Lewis, county architect, Aberystwyth.

PLUMBING & SANITARY

May 3. DAWLISH (Devon). — Laying about 2½ miles of stoneware pipe sewers and other incidental work, for the U.D.C. Drawings and specifications prepared by the engineer and surveyor. Drawings and conditions, specifications, and bills of quantities, at the office of the engineer and surveyor, J. F. C. Churchward, Dawlish, on deposit of £3 3s. Tenders to be sent to Francis S. Cole, clerk, by May 3, endorsed on envelope "Tender for Sewers."

May 3. STOCKPORT.—Manual and team labour and materials required in laying (about) 3,300 lineal yards of stoneware pipe sewers, ranging from 6in. to 21in. in diameter, together with the necessary manholes and lampholes, in Broadstone Road and Broadstone Hall Road, for the borough extension committee. Plans, sections, etc., and conditions of contract, specification, and form of tender, of John Atkinson, A.M.I.C.E., borough surveyor, town hall, Stockport. Tenders, addressed "The Borough Surveyor, Stockport," endorsed "Tenders for Sewers in Broadstone Road," etc., to be delivered at his office by noon on May 3. Fair wages clause.

May 4. BUSHEY.—Provision and construction of detritus tank, dosing chamber, precolation beds and sprinklers, sand filters, alterations to septic tanks, for the U.D.C. Plans, etc., on application to the engineer and surveyor, Ernest E. Ryder, council offices, Bushey. Specification etc., on deposit of £3 8s. Tenders by May 4.

May 4. EALING.—Construction of new surface-water sewers and hanholes in various roads, about 2,900 feet of 9-in. stoneware pipe, for the corporation. Drawings and specification and forms of tender, with schedule of quantities and other particulars, from Charles Jones, M.Inst.C.E., borough engineer, town hall, Ealing, W., on deposit of £2 2s. Tenders, endorsed "Tender for New Surface-Water Sewers," by 9.30 a.m. on May 4, to Geo. E. Brydges, town clerk, town clerk's offices, town hall, Ealing, W.

May 10. HASTINGS.—Laying about 450 feet run of nine-inch pipe sewer, at the rear of Ashburnham Road, and other work in connection therewith, for the corporation. Drawing and specification and form of tender at the office of the borough engineer, P. H. Palmer, M.I.C.E., town hall, Hastings. Tenders, endorsed "Tender for Sewer, Ashburnham Road," by noon on May 10, to Ben. F. Meadows, town clerk, town hall, Hastings.

May 12. WELLS, Somerset.—Alterations and additions to the Sewage Disposal Works, in the parish of Saint Cuthbert Without, Somerset, comprising the conversion of four existing contact beds into primary continuous filters, construction of an additional primary filter, secondary filters, and other works, in accordance with plans and specification by the engineer, A. P. I. Cotterell, M.Inst.C.E., 28, Baldwin Street, Bristol, for the C.C. Plans, copies of specification, form of tender, and bill of quantities on deposit of £3 3s., of Edwd. P. Foster, town clerk, town clerk's office, Wells, Somerset, to whom tenders are to be sent by 10 a.m. on May 12.

May 14. SWANSEA.—Erection of works of sewerage at Gorseinon, including all excavations, laying of pipes, constructions of manholes, flushing chambers, etc., and supply of all materials, for the R.D.C. Contract, drawings, and specifications, after May 29, of Morgan W. Davies and Partners, engineers, 3, Gloucester Place, Swansea, where copies of schedules of quantities and forms of tender may be obtained on deposit of £2 2s. Tenders, endorsed "Gorseinon Sewerage," by May 14, to Edward Harris, clerk, D.C. offices, Alexandra Road, Swansea.

May 15. STRETFORD (Manchester). — Works of drainage in the following private roads or streets, for the U.D.C.:—Chatham Road and Wellington Crescent. Drawings and specification and forms of tender, with schedule of quantities and other particulars, on application to Ellis Nuttall, inspector of nuisances, on deposit (cheque) of £2 2s. Tenders, endorsed "Combined Drain," addressed to the chairman of the sanitary committee, to be delivered at the council offices, Old Trafford, by May 15.

ROADS AND CARTAGE.

May 3. ROMFORD. — Spraying 36,000 super yards (more or less) of roads with Clare's tar compo., for the U.D.C. The work must be carried out at such times between May 10 and June 14 as may be ordered by the surveyor. Forms of tender on application to J. Turvey, surveyor to the council. Tenders, endorsed "Tender for Tar Spraying," must be delivered before May 3 to Charles T. King, clerk, council offices, Romford.

May 3. RHYMNEY.—1. Hiring a 10-ton steam roller and scarifier for about three months. Tenderers to supply living van, driver, flagman, notice boards, water cart, coal and all stores. 2. About 2,000 tons of clean limestone, broke into a gauge of 2½ inches, delivered as follows:—Rhymney R.R. and B. and M.R. Stations, about 1,500 tons. Rhymney Bridge L. and N.W. Station, about 500 tons. 3. About 300 tons limestone gravel, delivered as follows:—Rhymney R.R. and B. and M.R. Stations, about 250 tons. Rhymney Bridge L. and N.W. Station, about 50 tons. Samples to be sent to 61, High Street, Rhymney. 4. Haulage of limestone and gravel per ton, including filling from truck and stock on grounds. 5. Horse, cart, and man, daywork. Tenders, by May 3, to Ll. Reynolds, solicitor, Milbourne Chambers, Merthyr Tydfil. Forms of W. Lloyd Marks, surveyor, 61, High Street, Rhymney.

May 4. GLASGOW.—Materials and jobbing work for one year from June 1: (1) whin metal and causewaying; (2) cartage work; (3) coal and dross; and (4) mason work, for the corporation. Specifications and forms of offer on application to James Whitton, superintendent of parks, City Chambers. Offers, marked outside "Offer for —— Parks Department," must be delivered by May 4, to A. W. Myles, town clerk, City Chambers, Glasgow.

May 4. HANDSWORTH (Staffs.).—Making College Road and Stockwell Lane, and improvements in Oxhill Road, Friary Road, Holyhead Road, and Aldridge Road, for the U.D.C. Conditions of contract and drawings and specification, bills of quantities, and form of tender on application to H. Richardson, A.M.Inst.C.E., surveyor to the council. Specification, bills of quantities, etc., on deposit of £3 3s. Tenders, endorsed "Street Improvement Works," to be delivered at the office of the surveyor, council house, Handsworth, Birmingham, before noon on May 4. Fair wages clause.

May 4. THORNHILL.—Making up Walker Street, situate between Lees Hall Road and Ingham Road, Thornhill Lees, for the U.D.C. Drawings, specification and general conditions and forms of tender and bill of quantities of A. Rothera, M.Inst.M.C.E., engineer and surveyor, council offices, Thornhill, on deposit of £1 1s. Tenders, endorsed "Tender for Private Street Improvements," to be delivered by 5 p.m. on May 4. to J. H. Dyson, clerk to the council, council offices, Thornhill, near Dewsbury. Fair wages clause.

May 4. EALING.—Making up Airedale Road, Devonshire Road, Hessel Road (from Marder Road to Midhurst Road), Marder Road, Salisbury Road (from Northcroft Road to Coldershaw Road), Windermere Road (from Northfield Lane to No. 68), for the corporation. Drawing and specifications and form of tender, with schedule of quantities and other particulars, from Charles Jones, M.Inst.C.E., borough engineer, town hall, Ealing, W., on deposit of 10s. 6d. for each road. Tenders, endorsed "Tender for Making up ——," by 9.30 a.m. on May 4, to Geo. E. Brydges, town clerk, town clerk's office, town hall, Ealing, W.

May 5. NEW HUNSTANTON.—Making up Hill Street, New Hunstanton, for the U.D.C. Specification and plan and particulars at the office of the council's surveyor, New Hunstanton. Tenders, endorsed "Tenred for Private Street Works," by noon on May 5, to J. S. B. Glasier, clerk to the council.

May 5. IRLAM.—Supplying, for the year ending March 31, 1910, broken granite, macadam and chippings, limestone macadam and chippings, kerbs, copper flag, cinders, stoneware pipes, pitch, tar, and oil, for the U.D.C. Also for paving, flagging, etc. (labour only), and hire of steam roller. Forms of tenders and any further information from G. H. Kay, A.M.I.C.E., engineer and surveyor, council offices, Irlam. Tenders by noon on May 5, to Joseph Cooke, clerk, council offices, Irlam.

May 5. HESTON.—Dressing about 165,000 sq. yards (more or less) of road surfaces for the Heston and Isleworth U.D.C. Further particulars, etc., from J. G. Carey, engineer and surveyor, council house, Hounslow. Tenders to be sent by May 5.

May 5. LITTLEHAMPTON.—Improvements to Terminus Road and High Street, comprising the scarifying, levelling, and steam rolling of the macadam surfaces, and finishing same with proper tar coating and sanding, about 3,750 square yards in all, for the U.D.C. Specification and form of tender on application to the council's surveyor, H. Howard, F.S.I., town offices, Littlehampton. Tenders, marked "Road Work," to be forwarded to the chairman of the council, town offices, Littlehampton, by May 5.

May 6. LONDON.—Laying tar paving at 59 and 61, Hornsey Rise, N. (for receiving homes) for the guardians of the poor of the parish of St. Mary, Islington. Plan, specification, and conditions of contract of Howard Goodchild, 409, Holloway Road, N., up to May 1. Specification upon deposit of £2. Tenders by 3 p.m. on May 6, to Edwin Davey, clerk, guardians' offices, St. John's Road, Upper Holloway, N.

May 8. HITCHIN.—Supply and delivery of 2,400 tons of 2in., 1½in., and 1¼in. broken granite (more or less), in such quantities as may be ordered by the surveyor, for the U.D.C. Tenders at per ton delivered at the Great Northern and Midland Railway stations respectively, with samples of granite of the sizes specified, to be left at the council offices, town hall, Hitchin, by 1 p.m. on May 8.

May 10. LONDON.—Constructing a new road at Muswell Hill, N. Plans, sections, and details, and a copy of the specification, upon personal application to Vigers and Co., 4, Frederick's Place, Old Jewry, E.C. Tenders to be delivered to C. J. Hayter, 84, Temple Chambers, Temple Avenue, E.C., before noon on May 10. 5s. deposit.

May 10. LEEDS.—Paving and flagging the following private streets:—Raven Road, Stanmore Hill, Mexborough Street, Bentley Grove, back Bentley Grove, Monkbridge Street, cross Monkbridge Street, Monkbridge Place, Monkbridge Terrace, back Monkbridge Road, Estcourt Avenue. Back Estcourt Avenue, Estcourt Terrace, and Canterbury Road, for the corporation. Also for paving the following highways:—Aldbury Road, Albert Street, and Saynor Road. Drawings of the private streets at the city engineer's office, Municipal Buildings. Forms of tender and bills of quantities and copies of the documents on application at the highways office, 155, Kirkstall Road, Leeds. Tenders, endorsed "Tender for Street Work," and addressed to the highways committee, must be delivered at the town clerk's office, town hall, Leeds, by 10 a.m. on May 10.

May 11. FAVERSHAM.—Supply and delivery of 430 tons of best Guernsey granite, broken to a 2-in. gauge and well screened, to be delivered as under:—Alongside Conyer Wharf, Teynham, 220 tons; in trucks at Selling Station, S.E. and C.R., 210 tons, for the R.D.C. Form of tender and further particulars on application to the district surveyor, J. G. Chittenden, Ashford Road, Faversham. Tenders, endorsed "Tender for Granite," to be delivered by May 11, to Allan Tassell, clerk, council offices, Faversham. Samples to be sent to the surveyor by May 8.

MISCELLANEOUS.

May 3. GATESHEAD.—Supplying disinfectants, comprising powder, fluids, and soaps, for the year ending April 30, 1910, for the corporation. Particulars can be obtained on application to the medical officer of health. Tenders to be sent marked "Tender for Disinfectants," by May 3, to W. Swinburne, town clerk.

May 4. LONDON.—Withdrawing about 18 miles of low tension lead covered cables, now laid and jointed in stoneware ducts. and relaying and jointing about 15 miles of low tension lead covered cables, etc., for the L.C.C. Full particulars in the "London County Council Gazette," of April 26. Tenders, upon forms to be obtained from the clerk, upon deposit of £2 with the cashier. Tenders by 11 a.m. on May 4, to G. L. Gomme, clerk of the L.C.C., county hall, Spring Gardens, S.W.

May 3. HENDON.—Tar-painting about 50,000 yards super. of macadamized main roads, etc. Also supply and delivery of from 5,000 to 10,000 gallons of approved distilled tar into tanks or vessels where required, for the U.D.C. Particulars and forms of tender of S. Slater, Grimley, engineer and surveyor, council offices, The Burroughs, Hendon, N.W., on deposit of £10 with the clerk to the council. Tenders, endorsed "Tender for ————," as the case may be, to be addressed to the chairman of the council, and sent by 5 p.m. on May 3, to Henry Humphris, clerk to the council, council offices, Hendon, N.W.

May 4. LONDON.—Cleaning boilers and other plant at the various establishments, for a period of three years, for the Lambeth board of guardians. Forms of tender on application to James L. Goldspink, clerk, guardians' boardroom and offices, Brook Street, Kennington Road, S.E. Tenders to be sent by May 4.

May 5. NEWPORT, ISLE OF WIGHT.—Laying-out a burial ground at Ashey, including building a tool house and the erection of a wall, gates, and fence, for the R.D.C. Plans and specification of J. I. Barton, 1, St. Thomas Street, Ryde. Tenders, marked "Tender for Ashey Burial Ground," by May 5, to H. Eldridge Stratton, clerk to the council, R.D.C. offices, 30, Pyle Street, Newport, Isle of Wight.

May 12. LONDON.—Supply, delivery, and, where necessary, fixing of carpets, rugs, tables, desks, bookcases, chairs, glasses, fenders, electric light fittings, etc., for rooms in the town hall. extension, for the corporation of Chelsea. Drawings, conditions, specication, schedule, and form of tender by the borough surveyor, and printed copies of which (except the drawings), with information, may be obtained from him at the town hall. Tenders by 5.15 p.m. on May 12, to T. Holland, town clerk, town hall, King's Road, S.W.

THE
Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE architect prepares designs, perspectives, working drawings, etc., on moderate terms.—W., 6, King's Road, Kingston-on-Thames. 4918

ABLE ASSISTANCE rendered, drawings, tracings, photo-prints prepared, plans from rough sketches, specifications, etc.—Yorkshire Drawing Office, 21, Scale Lane, Hull. 4940

ACADEMY (Royal) exhibitor prepares perspectives on moderate terms; specimens sent; also designs, plans from rough sketches, drawings, tracings, competition work, etc.—Box 4983, BUILDERS' JOURNAL Office.

ADVERTISER (28), seeks position of trust in a business; 10 years with large London builders; good references; security would be given, if required.—Address, E.G., 6, The Avenue, Brondesbury, N.W. 5012

ARCHITECT'S Assistant (24), disengaged; Inter. R.I.B.A.; 6½ years' varied experience; working drawings, details, and perspectives, levelling; assist with quantities; shorthand and typewriting; excellent references. — S. Riches, 35, Culverden Road, Balham, S.W. 4963

ADVERTISER (20), three years with Quantity Surveyors, wishes to enter Builders' Office (preferably estimating department): excellent testimonial; very low commencing salary, with good prospects. —E., 2, St. Mary's Road, London, S.E. 4960

APPOINTMENT as Improver (19), just completed three years' articles with architect; good draughtsman, tracer, etc.; excellent testimonials; moderate salary.—J.S.C., 10, Almeric Road, Clapham Common. 4993

ARCHITECT and Surveyor's Assistant (25). 9 years' experience; excellent draughtsman, working drawings. details, specifications, perspectives, surveying, French, typewriting; moderate salary.—Arthur Bailey, 26, North Street, Hailsham, Sussex. 4819

ARCHITECT'S Assistant desires engagement, finalist, R.I.B.A.; design, details, specifications; first-class honours, quantity surveying, honours (Part I.), building construction, artistic and practical; moderate salary.—Address, Architect, 24, Brunswick Street, C.-on-M., Manchester. 4984

ARCHITECT'S Assistant (22), six years' experience; student R.I.B.A., good draughtsman, contract drawings, details, surveying, etc.; assist with quantities; salary moderate.—J. J. S., 1, Silver Street, Stockton-on-Tees. 4888

ARCHITECT'S Assistant (27), excellent draughtsman and colourist; contract drawings, specifications, details, design, perspective, surveys, etc.; travelling studentship winner; highest refs.—Box 4902, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant (26), desires engagement at moderate salary; good draughtsman.—Address, Young, Narellan, Old Colwyn. 4950

ARCHITECT'S Assistant (24), disengaged; Inter. R.I.B.A., 6½ years' varied experience, town and country; working drawings, details, and perspectives; levelling, reinforced concrete details; assist with quantities.—Riches, 35, Culverden Road, Balham, S.W. 5013

ARCHITECT'S Assistant (23), 6½ years' experience; excellent draughtsman, working drawings, details, specifications, surveying; assist with quantities; first-class references.—H.B., 23, Springfield Road, Bury St. Edmunds. 5001

ARCHITECT'S Assistant seeks engagement; plans details, quantities, surveying, levelling dilapidations, etc.; excellent references; 14 years' experience.—C.G., Brooklyn, Leas Road, Guildford. 5010

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill, S.W. 4992

ARCHITECT'S Assistant (23), excellent draughtsman, desires re-engagement; six years' first-class experience; contract, detail and competition drawings, specifications, perspectives (exhibitor at Royal Academy); prizeman for architectural design; highest references; moderate terms.—F.E.T., 10, Cobham Road, Kingston-on-Thames. 5015

ARCHITECT, 32, qualified, seeks any position where his services would be available; energetic; disengaged; mod. salary.—Box 4006, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant (25), R.I.B.A. exam.; 9 years' London experience; design, working drawings, details, specifications, estimating, quantities, levelling, perspectives, dilapidations, etc.; salary moderate.—W., 7, Poulton Road, N.E. 5014

ARCHITECT'S Junior Assistant disengaged, 4½ years' articles, wishes to meet with architect in Lancashire office; specimen drawings, certificates for construction; sitting for Inter. R.I.B.A., June.—Apply, J. S. H., Wittington Lane, New Springs, Wigan. 4815

ASSISTANT, provincial experience, good planner and designer, domestic, Renaissance, working drawings, details, surveying, competitions; excellent draughtsman, A.R.I.B.A. at one sitting; age 27.—Box No. 4928, BUILDERS' JOURNAL Office.

BUILDER'S or Architect's Assistant (25), Inter. R.I.B.A.; neat draughtsman, levelling and surveying; assist quantities, specifications, accounts, and general routine; excellent references; moderate salary for experience. — H. O'R., 80, Lavender Sweep, Clapham Common, S.W. 4973

BUILDERS' and Contractors' Assistant desires situation, knowledge of plans, specifications, quantities, wages and general office routine; age 21; 4½ years' experience; salary moderate; good timekeeper.—Box 4994, BUILDERS' JOURNAL Office.

BUILDER and contractor's estimating and managing clerk seeks berth, exceptionally good all-round qualifications, acquired by sound London and provincial experience, and a reliable and successful estimator, including sewerage and kindred works; good references.—T. C., 3, Hampton Terrace, Brighton. 4933

BUILDER (38), life experience, seeks engagement as Building or Estate Clerk of Works or Builders' General Foreman; thorough knowledge of plans, details, quantities, and accounts; accurate setting out; good manager all trades.—Box 4958, BUILDERS' JOURNAL Office.

BUILDERS' general foreman, 10 years' varied experience; first-class work and references.—W.J.F., 2, Broseley Cottages, Great Bookham, Surrey. 5002

BUILDING Trades' Exhibition, 1909.—Gentleman, with wide architectural experience, offers services to provincial or other exhibitors as representative at their stand; for terms apply Box 4931, BUILDERS' JOURNAL Office.

BUILDING Exhibition.—Young architect is prepared to assist exhibitors at the above; can reach same daily; terms low.—Box 4925, BUILDERS' JOURNAL Office.

CARPENTER, and French polisher wants situation, young, capable workman, good refs.; moderate wage.—C.P., 21, Redstone Road, Redhill, Surrey. 4989

CLERK of Works, shortly disengaged, first-class, well up in all trades; abstainer; best London references.—R.E., 3, Oakfield Road, Stroud Green, London, N. 4986

CLERK of Works, disengaged; experienced in building and engineering works; home or abroad; fluent French, translations.—Address, Tett, 78, Durban Road, Beckenham, Kent. 4988

CLERK of Works, shortly disengaged; first class; well up in all trades; best London references; abstainer.—R. E., 2, William Road, Guildford, Surrey. 4972

CLERK of Works, first-class, well up in all trades; disengaged shortly; best London references; abstainer.—R.E., 3, Oakfield Road, Stroud Green, N. 5009

CLERK of Works, desires re-engagement, possessing first-class testimonials for ferro-concrete construction, also from Metropolitan Borough Councils, eminent architects and engineers; age 45.—Box 4922, BUILDERS' JOURNAL Office.

DRAUGHTSMAN (26), home or abroad, neat, quick tracer and colourist, working drawings from rough sketches, bookkeeping and general office routine; foreign experience.—H.W., 64, Crofton Road, Camberwell, S.E. 5003

ENGINEER, 29, disengaged; exp. in designs, detail, drawings, calculations, quantities, structural steelwork, fireproofing, reinforced concrete, bridges, buildings.—Box No. 4991, BUILDERS' JOURNAL Office.

ENGINEER, mechanic, desiring change, requires permanent situation on staff, official or private; thorough all-round general experience; married.—J.G., 86, Bathurst Gardens, Willesden, N.W. 5011

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W. 4951

MASONRY, manager or foreman, machinery and all details, all classes of masonry work; London and country experience; terms moderate.—G.B., 38, Napier Road, Tottenham, London. 4975

OUTDOOR representative, surveyor's assistant (25), disengaged, requires appointment; had experience interviewing, canvassing, knows London well; well educated, and of good address; first-class references.—Box 4952, BUILDERS' JOURNAL Office.

REINFORCED CONCRETE.—Details, drawings, calculations, and assistance generally, rendered to architects, builders, etc., by a specialist of large experience; terms moderate.—Box 4887, BUILDERS' JOURNAL Office.

SHOP-FITTING, or high-class joinery, advertiser (38), seeks situation as foreman in shop-fitting or high-class joinery works; can take full control; 9 years' references; abstainer.—Box No. 5007, BUILDERS' JOURNAL Office.

SURVEYOR'S Assistant seeks re-engagement; 9½ years with municipal engineer; exceptionally good testimonials; well up in surveying, levelling, etc., and all work appertaining to a surveyor's or contractor's office. — Box 4971, BUILDERS' JOURNAL Office.

TO Builders.—Experienced, practical Builder Surveyor undertakes preparation of estimates and settlement of accounts on reasonable terms.—Box 4957, BUILDERS' JOURNAL Office.

TO Manufacturers.—Gentleman, with valuable connection among engineers, railway companies, and contractors, is prepared to undertake London agency for one or two good firms; offices in Westminster; highest references given. — Box 4967, BUILDERS' JOURNAL Office.

WORKING shop foreman seeks re-engagement, thoroughly practical and reliable carpenter and joiner; abstainer; 7 years' ref.; age 38; wages moderate.—C. M., 16, Margett's Road, Kempston, Bedford. 4932

Appointments Vacant.

CLERK to Builder, double entry; state experience, wages, references; all branches.—Box No. 5004, BUILDERS' JOURNAL Office.

NORTHAMPTONSHIRE COUNTY COUNCIL EDUCATION COMMITTEE.

An Assistant will shortly be appointed in the Education Surveyor's Department. He must be a good draughtsman, and accustomed to inspect and report on work in progress. Experience in an architect's or a Surveyor's office is essential.

The salary offered is £120, rising by £5 increments to £150 per annum.

Forms of application may be obtained from the undersigned, and must be returned not later than Saturday, May 8, 1909.

J. L. HOLLAND,
Secretary of Education.
County Education Offices,
Northampton. 4998

WANTED at once, by an estate and house agent, a general architectural assistant, competent in design, construction, specifications and shorthand; if quantities preferred; to reside with the principal; state full particulars, experience, references and salary.—M., 13, Holmesdale Road, Sevenoaks. 4990

ARTICLED Pupil—Reinforced Concrete. Required a young gentleman as articled pupil in reinforced concrete specialist's office, one with a knowledge of elementary applied mechanics, and mathematics and a taste for theory of construction and design preferred; an excellent opportunity for one willing to learn and understudy chief engineer.—Write, R. C., c/o Hastings Bros., Ltd., King's Chambers, Portugal Street, Kingsway, W.C. 4907

A START in Life,—Vacancy for youth as pupil; moderate premium required, in a county architect's office.—Pryer, Clarence Street, Gloucester. 4947

OFFICE Boy wanted, by a builder, at West End; apply, in own handwriting, stating age, salary, and experience, to Box 4974, BUILDERS' JOURNAL Office.
Box 4897.—This vacancy is now filled up, and advertisers tender thanks to all applicants for letters sent. 4970

THE GUILD OF ARCHITECTS' ASSISTANTS.

A Guild of the profession formed to promote and maintain the interests of Assistants.

The Committee desire to receive the names of all interested in the proposals of the Guild, and any expressions of opinion thereon. All information required will be given by the Secretary, 60, Idmiston Road, Stratford, E. 4985

May 5, 1909. **Volume 29. No. 743.**

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders:—The Wellington Monument; "Let Glasgow Flourish," De Gustibus, 427; The Trades Boards Bill, Architect's Charges in the United States - - 428
The Society of Architects: Annual Dinner - 428
Architects of the Day, I.—Messrs. Mewès and Davis (concluded) - - - - - - 430
Architecture at the Royal Academy - - 432
Views and Reviews - - - - - - 432
Notes on Competitions - - - - - 434
Enquiries Answered - - - - - - - 434

CONTRACTOR'S SECTION.

Dry-rot and Legal Liability - - - - 437
Scaffolding and Appliances at the Building Exhibition. By A. G. H. Thatcher - - 438
Matters of Opinion, II.—The Taxation of Land Values and its Effect upon Building; with an article on the Taxation of Land Values in Town, by Victor D. Horsburgh, A.R.I.B.A. - - - - - - - 439
A Portable Scaffold—Belgian Style. - - 442
Employers' Insurance - - - - - - 442
Builders' Notes - - - - - - - 442
Proposed New Buildings - - - - - 443
Buildings in Progress and Completed - - 444
Memoranda - - - - - - - - 444
Trade and Craft - - - - - - - 444
The National Federation of Building Trades Employers of Great Britain and Ireland: Official Reports - - - - - - 445
Tenders - - - - - - - - vi., viii.
Complete List of Contracts Open, xxv., xxvi., xxvii.

ILLUSTRATIONS.

The Edgar Allen Library, Sheffield University, E. M. Gibbs, F.R.I.B.A., architect - - 429
Architects of the Day, I.—Messrs. Mèwes and Davis. Chateau de Rochfort-en-Yvelines (Seine et Oise), The Colonnade, 430; Plan, 433, and Centreplate; decorations of s.s. "Kaiserin Auguste-Victoria," Hamburg-America Line - - - - - 431, 432
Enquiries Answered: Diagrams - - 435, 436
Scaffolding and Appliances at the Building Exhibition, Figs. 1—10 - - - 438, 439
A Belgian Portable Scaffold - - - - 442

The Wellington Monument. It cannot be said that Mr. Ernest George's letter to "The Times" anent the proposed completion of the Wellington Monument has met with a very satisfying reply from the Completion Committee. Mr. George, on behalf of his Council, was "wanting to know, you know," and his letter was a recapitulation of the points raised by Mr. John Belcher which have already appeared in our pages. We presume that the Council of the R.I.B.A. are anxious to ascertain what steps the committee propose to take to remedy the signs of stress which have appeared in the monument, and to learn what provision will be made for the extra weight upon the structure which the erection of the equestrian figure will entail. It is the misfortune of the Council that, as in many other things, it moves rather late in the day. The rough plaster model, cast from Stevens's original model, was placed in position so far back as 1903, and a second model, revised by Mr. John Tweed, was erected in place during 1907. It cannot therefore be said that the Completion Committee are acting with undue precipitancy; and the possible danger of adding a superincumbent weight to the monument was at least of as much moment in 1903, when the committee's intentions first began to take shape, as at the present day. Mr. Harold Hodge employed the opportunity for sarcasm which the Institute methods provided for him. "It was no duty of the committee," he says, "to meet expressly to answer a roving request for information as to a design which had been exhibited in public for many weeks in the year before last," and retorts that the intelligence of the Dean and Chapter may be sufficiently trusted to warrant a belief that they consulted expert opinion before agreeing to the committee's proposal. The R.I.B.A. is in the anomalous and unfortunate position of a prophet without honour in his own country; and its well-meant and disinterested efforts to act in all things for the honour and welfare of architecture as a great art are only regarded by outsiders as the impertinent intrusions of a body of professional men working entirely in their own interests The remedy is to hand; but the R.I.B.A. as at present constituted, is not likely to utilise it. It is very certain that until the Institute occupies an official and recognised position in the public mind its declarations and decrees will fail to elicit the sympathy and respect which such a society should command. Some enquiries subsequently made of members of the Chapter of St. Paul's by a representative of "The Times" go to prove that that body is fully informed with expert opinion on the subject. The weakness and cracks had first been detected by the Foreman of Works to the Cathedral authorities, and had been remedied. The Dean and Chapter welcomed suggestions from those competent to offer them; but it was not apprehended that there would be any difficulty in strengthening the monument, so that, while not altering its appearance in any way, it would carry the statue.

"Let Glasgow Flourish." The Town Planning Bill is likely to suffer acutely at the hands of its friends. In Glasgow there is a disposition to damn it with faint praise. The Town Clerk of that city, in a report prepared for submission to the Corporation, while admitting that "in principle the Bill marks a distinct advance in endeavouring to substitute a systematic and comprehensive scheme for the haphazard and limited methods at present available," nevertheless opines that "from the Scottish standpoint it is not worth having with its serious defects and flaws," and he suggests that unless these are amended, this part of the Bill should not apply to Scotland. The Bill, he points out, ignores the city's existing powers, makes no provision by which local authorities can be recouped for expenditure incurred in the execution of a scheme, and does not show sufficient cognisance of local circumstances. This almost inevitable consequence of extreme centralisation was pointed out in these columns when the Bill was first printed, more than a year ago, and we are therefore the less disposed to minimise the difficulties that the astute Glaswegians have now raised. Nevertheless, we trust that they will not persevere in the effort to render an essential part of the Bill inoperative as regards their important city. Their example might prove contagious, to the possible destruction of the vital principle of a Bill which, looked at "by and large," has won the approval of those who set the general good above and beyond local or sectional interests, some of which must necessarily suffer from the operations of so sweeping a scheme. In the meanwhile, as if in further vindication of the independence of the North, there comes an announcement that plans for rebuilding the central area of Port Glasgow, at a cost of £100,000, have been submitted by the trustees appointed by the late Mr. Lithgow, the millionaire shipbuilder. . Narrow and congested alleys are to be swept away, and streets of an average width of 50 ft. to 60 ft. are to be substituted, with substantial and sanitary working-class dwellings for 1,750 people. The trustees are "to see the work pressed to a finish;" but will not the imminence of the Town Planning Bill give them pause? In these times of depression, we are very reluctant to see work postponed; and that is one strong reason for wishing that the Bill may be allowed to come into operation with the least possible delay. The sooner it gets through, or, alternately, the sooner it is smashed—an improbable contingency, perhaps—the sooner will begin the building boom for which we are all so anxiously waiting.

De Gustibus. The Museum for National Industries at Stuttgardt having been enriched by "a permanent exhibition of objects which are flagrant examples of bad taste in modern furniture, etc.," the "Observer"—the oldest and the most art-loving of Sunday newspapers—has industriously "collected the opinions of a number of persons of acknowledged authority and influence in the world of art" as to whether the establishment of a similar Chamber of Horrors in London is desirable. Strangely enough, the question has elicited serious replies from men whose opinions on art are worthy of attention. They all discountenance the idea of exhibiting shocking examples. Mr. Walter Crane thinks that people are apt to acquire a liking for what they see. "The public are easily educated to like the ugly. The eye gets accustomed to and welcomes what is usual, and resents an innovation, no matter how great an improvement." Mr. Crane, like all the rest of the gentlemen whose opinion in this delicate matter of shocking examples was sought, talked about architecture! He remarked that "the modern steel-frame building was not honest, because it did not explain itself, but was faced with terra-cotta, which had nothing to do with construction." He added that the enormous shop-fronts of plate-glass annoy him more than anything else in London street architecture. Mr.

M. H. Spielmann thought that any really representative Museum of Monstrosities should certainly include the old-fashioned street lamp-posts, and that most chimney-pots are shocking. Waterloo Bridge is a great consolation to him; he thinks it the most dignified and beautiful bridge in the world; and he acknowledges that, owing largely to the influence of the R.I.B.A., there has been, during recent years, a remarkable improvement in English domestic architecture. Wall-papers, he thinks, are growing too gaudy, perhaps as a revulsion from the other extreme. "What people want is not good taste, but novelty." Mr. Aymer Vallance also regrets the revulsion to Early Victorian wall-papers. "People are not guided by principle, and whatever happens to be the rage for the time being they accept." Asked what he considered to be the ugliest building in London, he replied, "St. Paul's Cathedral!" He is in love with late Gothic, which has become "perfectly English," and deems that Italian and Moorish styles are exotic to this country. The other gentlemen whose opinions are cited are "a high official of the British Museum" and Mr. Bernard Partridge, the "Punch" artist. The former thinks that the "pepperpot" cupolas on the National Gallery are among the worst architectural blemishes of London; the latter, that no Museum of Monstrosities would be complete without at least one of the statues in Trafalgar Square.

The Trade Boards Bill. The debate on the Trade Boards Bill in the House of Commons on Thursday last was sustained for about five hours, but brought forth no very striking addition to the pros and cons with which readers of this journal are already well acquainted. Mr. H. Marks moved an amendment in these terms: "That, in the opinion of this House, no legislation can be effective to secure fair wages for workers in this country which does not prevent foreigners who work at lower wages from sending the product of their cheaper labour here in competition with them." This amendment, which was seconded by Sir W. Bull, was withdrawn, in deference, no doubt, to the recommendation of Mr. Balfour, and the Bill was read a second time. It had the effect, however, of diverting the debate from those aspects of the Bill with which the building trades are more intimately concerned, and of bringing into prominence the encouragement it affords to foreign competition. Sir F. Banbury, however, predicted that, within a few years of the passing of the Bill, the idea that trade unions could look after themselves would disappear, and Parliament would be asked to extend the measure to all industries, whether they were protected by trade unions or not—a view that has been stated with greater amplitude in these columns.

Architects' Charges in the United States. The question of the remuneration of the architect has been agitating the minds of our trans-Atlantic brethren for many years past, and the advisability of instituting an increase in the hitherto accepted percentage has formed a favourite topic for discussion at numerous conventions. We are now glad to learn that, at the recent convention of the American Institute of Architects held in Washington, an important change was adopted in the rate of charges for professional services, a proposal to increase it from five to six per cent. being unanimously adopted. The charges as thus amended now form part of the revised schedule sanctioned by the American Institute. During the course of the discussion it was pointed out that whilst the architect's remuneration had been stationary in the past forty years, the cost of production, brought about by an increase of office expenses and draughtsmen's salaries, had nearly doubled. It was also rightly urged by some of the speakers that proper professional equipment required a longer preparation and a more thorough education, and that the responsibility of the architect had been enormously increased by the requirements of the modern structure with its engineering, mechanical, and electrical fittings. One well-known American architect considered that professional services, under modern conditions and requirements, could only be adequately remunerated by a charge of seven and a-half per cent. upon the total cost of the work, but ultimately, as we have said, the six per cent. basis was adopted. We hope to give in a future issue, the full revised schedule of the "Proper Minimum Charges sanctioned by the American Institute of Architects," and we advise those of our readers who are interested in the question of architects' fees to compare this document, clause by clause, with that issued under the auspices of the Royal Institute of British Architects. For instance, there is no ambiguity (as in our own unfortunately-worded schedule) with regard to the question of the ownership of the architect's drawings and specifications, which, as "instruments of service," remain (under Clause 12 of the American document) the property of the architect, whilst its first Clause is sufficiently definite in its statement that the minimum charge of six per cent. is based upon the total cost of the completed works. Again Clause 4 is to the effect that for building works conducted under separate contracts (rather than under a general contract) a *special* fee may be charged in addition to the ordinary scale of charges. Clause 6 touches upon a question which English architects would be well advised to settle once for all upon the same lines. It has reference to the employment of the professional specialist, and is as follows, viz.:—"Where heating, ventilating, mechanical, structural, electrical, and sanitary problems are of such a nature as to require the services of a specialist, the owner is to pay for such services. Chemical and mechanical tests and surveys when required are to be paid for by the owner."

Payment in respect of extra labour thrown upon the architect by reason of changes made by the client after a definite scheme has been approved, or through the delinquency or insolvency of a contractor, is provided for under Clause 8, whilst Clause 10 defines the basis of the settlement to be followed with regard to the architect's remuneration in the case of the abandonment or suspension of the work. After very careful consideration, we are compelled to admit that American architects manage their affairs far more successfully than their *confrères* in this country, where the official scale of charges for professional services has been so badly and vaguely worded that it is a constant source of irritation and a fruitful subject of litigation both to architect and client. But we have so often drawn attention to the many blunders made in drafting the R.I.B.A. scale of charges that it is quite superfluous to particularise them again.

SOCIETY OF ARCHITECTS.

There was a gathering of nearly 200 at the twenty-fifth annual dinner of the Society of Architects held at the Trocadero Restaurant, on Friday, April 23rd, when the chair was occupied by the President, Mr. Geo. E. Bond, J.P., and amongst those present or invited were:—Mr. Ernest H. Lamb, C.M.G., M.P.; his Honour Judge Rentoul; Messrs. A. A. Hudson (President of the Tribunal of Appeal); Edward White (Vice-Chairman London County Council); W. E. Riley, F.R.I.B.A. (Architect London County Council); G. L. Gomme, F.S.A. (Clerk London County Council); E. B. Barnard, M.P. (Chairman of the Metropolitan Water Board); Walter Cave (President of the Architectural Association); Howard Martin, F.S.I. (President of the Surveyors' Institution); E. Purnell Hooley, M.Inst.C.E. (President of the Association of Municipal and County Engineers); W. S. Wallis (President of the Institute of Builders); F. G. Rice (President of the Master Builders' Association); C. McArthur Butler, F.C.I.S. (secretary); etc., etc.

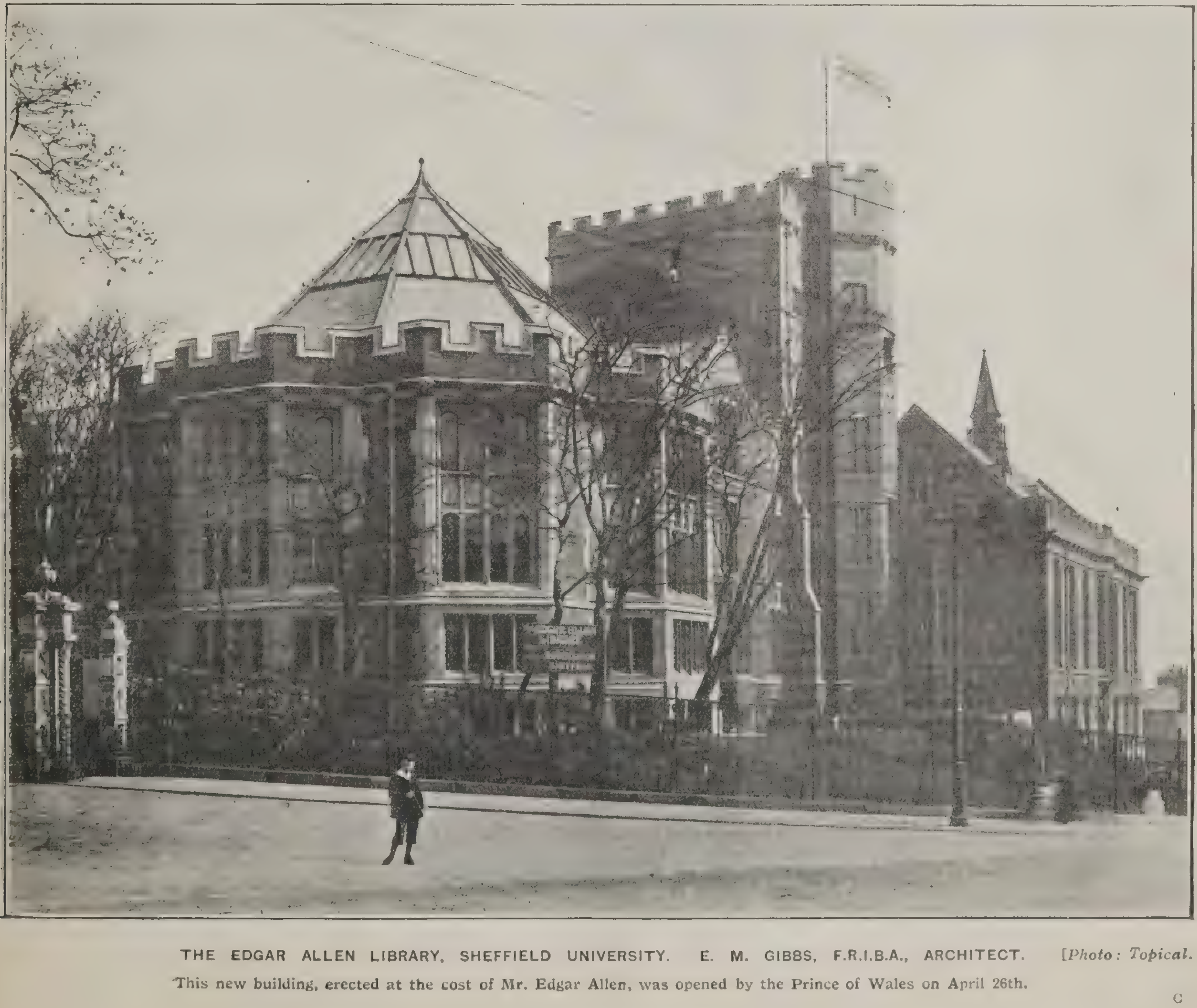
After the dinner, the usual loyal toasts were submitted from the chair and loyally honoured.

Judge Rentoul proposed the toast of "The Houses of Parliament" in a witty and entertaining speech, in which he eulogised the Houses of Lords and Commons in a humorous vein.

Mr. Ernest Lamb, M.P., whose name was coupled with the toast, responded, and said he wanted to say a word with reference to the Bill for the registration of architects. He would like to sound this note of warning—that while they in the House of Commons were sincerely anxious to do their best with the Bills that come before them, it behoved those who were more especially interested in any specific Bill to come, as far as possible, to a unanimous decision on their own behalf first of all. He thought the time had come when the profession should decide whether or not architecture was a profession or whether it was an art, because if a profession he agreed that it had a right to ask for protection in the form of registration, but if it was an art he thought it would be well to leave it to its own free development. If an Act of Parliament was asked for, it went without saying that before a Bill could be carried, a very exhaustive enquiry would have to take place, and he threw out the suggestion as to whether it would not be in the interests of the profession for such an enquiry to take place at the present stage, because at such an enquiry it would be bound to come out that there was not a unanimous demand on behalf of the profession itself for registration. He emphasised the need of closer union under their own central body before they came to the House of Commons and expected an Act for registration. He believed that if the profession could come to something like a unanimous decision on the matter, they would not find the House of Commons backward in giving them the support they needed.

Mr. E. B. Barnard, M.P., in submitting the toast of the evening, "The Society of Architects," said it was best to rely for advice upon the men who had concentrated their attention upon a particular subject. He was glad to propose the toast of the Society, which was asking for registration, not solely for itself, but mainly in the interests of the public.

The toast was enthusiastically honoured, and the President of the Society, in reply, delivered an eloquent speech, mainly concerned with the question of registration. Having briefly touched upon the history of the Society's efforts in this direction, he said that in promoting the Bill the members of the profession were not actuated entirely by selfish motives, because they maintained that it would prove of equal advantage to the building public. They desired to improve the status of the architect by securing for him legal recognition, permitting only the duly qualified to assume the title, and at the same time they wished to raise the general standard of professional practice by instituting a more thorough system of education and training, thus better preparing the architect for the onerous duties involved in his daily work. Secondly, they desired to protect the public from the evil results of the incompetence of persons who, without a single qualification, now styled themselves architects and practised as such. With regard to the first proposition, all sections of the profession were agreed that architecture demanded the whole-souled devotion of its *bona-fide* followers, and as a consequence its practice ought to be strictly confined to persons educated to perform those duties in an artistic and practical manner and to recognise and appreciate the delicacy of their great responsibilities. As the dominant principle of their Bill was the establishment of a scheme of compulsory qualifying examinations to be passed by every person before he commenced to practise, it was first necessary to prevent any augmentation of that undesirable, unqualified, nondescript class which was now practising architecture for profit only during intervals which its members occasionally secured from the pursuit of their more legitimate trades and callings. These qualifying examinations would prove a valuable stimulus to real and useful study among their students, for, given the necessary artistic qualifications, they would still be compelled to take advantage of all their educational opportunities, and to devote some appreciable portion of their spare time to the task of acquiring by study some knowledge of the practical, scientific, and business sides of professional practice. At present many architectural pupils neglected all their opportunities. The presence of this class in their ranks was an injustice to the *bona-fide* practitioner and the building public, and clearly demonstrated the necessity for some form of qualifying test. With regard to the second proposition, viz., the benefit of the public, he suggested that the health, comfort, and convenience of the community, its great financial interest in building operations, and all the pleasures it might derive from the contemplation of beautiful surroundings, were dependent to a large extent, not so much upon the qualifications or otherwise of the stars of the first magnitude in the architectural firmament, but more especially upon the artistic sense, practical ability, and commercial rectitude of the general body of practising architects throughout the country. At the present moment it was equally possible for a chimney sweep as for one of the young unqualified men he had referred to, to put out a brass plate and style himself "architect," and except by having a personal knowledge of the individual practitioners the public had no present means of differentiating between the qualified and the unqualified. He was not of the opinion that these examinations would prove an effective remedy for all professional and public evils, but he did maintain that the previous education, study, and special preparation of which these examinations would be the test would prove to be of infinite value to their future students, and ultimately to the advantage of future clients. The main opposition to their Bill might be fairly described as paradoxical, for it emanated from a select few who contended that artistic qualifications could not be tested. What that contention was really worth might be judged by the fact that at present the majority of these persons belonged to a body which had now for many years applied the very test they said was impossible, and, further, by making that test compulsory, they had practically admitted the initial principle of registration. Yet they said that the success of the Bill would result in a serious clipping of the wings of genius and tend to reduce their art to a dead level of stereotyped mediocrity! That was both illogical and absurd; but even considered from their point of view, he would suggest to them that they ought not to confuse the high artistic ideals of the few with the existing general practice throughout the country, and he would ask them if at the present moment they were perfectly satisfied in their own minds that the existing general conditions of practice throughout the country and the existing educational facilities were conducive to the best and highest interests of architecture as an art. They must all recognise that architecture was a constructional art, and, in its very highest form, sprang inevitably from the workings of true genius with sound practical knowledge in the best materials at its command. Therefore, he had no hesitation in saying that the upward flight of true architectural genius would be materially assisted by future artistic aspirants being constrained to acquire such an amount of practical knowledge of the scientific principles of construction and of the inherent properties of the very varied list of materials used in modern buildings as would enable them to pass successfully the suggested qualifying examinations. A duly qualified architect, competent to do justice to his clients, must not only be an artist, but also a scientist and a practical man of business. But for years now a cloud of false sentiment had been hanging over the



THE EDGAR ALLEN LIBRARY, SHEFFIELD UNIVERSITY. E. M. GIBBS, F.R.I.B.A., ARCHITECT. [*Photo: Topical.*

This new building, erected at the cost of Mr. Edgar Allen, was opened by the Prince of Wales on April 26th.

profession. Although this Society was rapidly growing, still they wished it to be distinctly understood that in pursuing their present path they did not aim at competition or rivalry with any other organisation, for apart from the public benefit, their only aim was to promote and advance the art and practice of architecture, and to maintain the honour and best interests of the profession as a whole. They claimed that the vast majority of practising architects throughout the country were in agreement with them, both as to the nature of the evils complained of, and as to the remedy for those evils, the remedy being the Bill which had now been before the country and the profession for 21 years without inducing the submission of any reasonable or adequate alternative. The time was now ripe for a mutual cessation of suspicions and petty jealousies, and for all sections of the profession to send fully accredited representatives to discuss this question in a reasonable and friendly spirit, and to agree, if possible, upon the main principles of the Bill to be submitted to Parliament, backed by the unanimous voice of the profession. The difficulties suggested by their opponents as standing in the way of success would appear to them to be far less formidable upon a closer view, and might be entirely removed by friendly discussion among gentlemen predisposed to efface self rather than further to jeopardise the honour and best interests of a grand and noble profession.

"The Local Authorities" was proposed by Mr. Walter Cave (President of the Architectural Association), and responded to by Mr. Edward White (Vice-chairman L.C.C.), and the Mayors of Marylebone and Rochester; and the last toast of the evening was that of "The Visitors," submitted from the chair and acknowledged by Mr. G. H. Leavey.

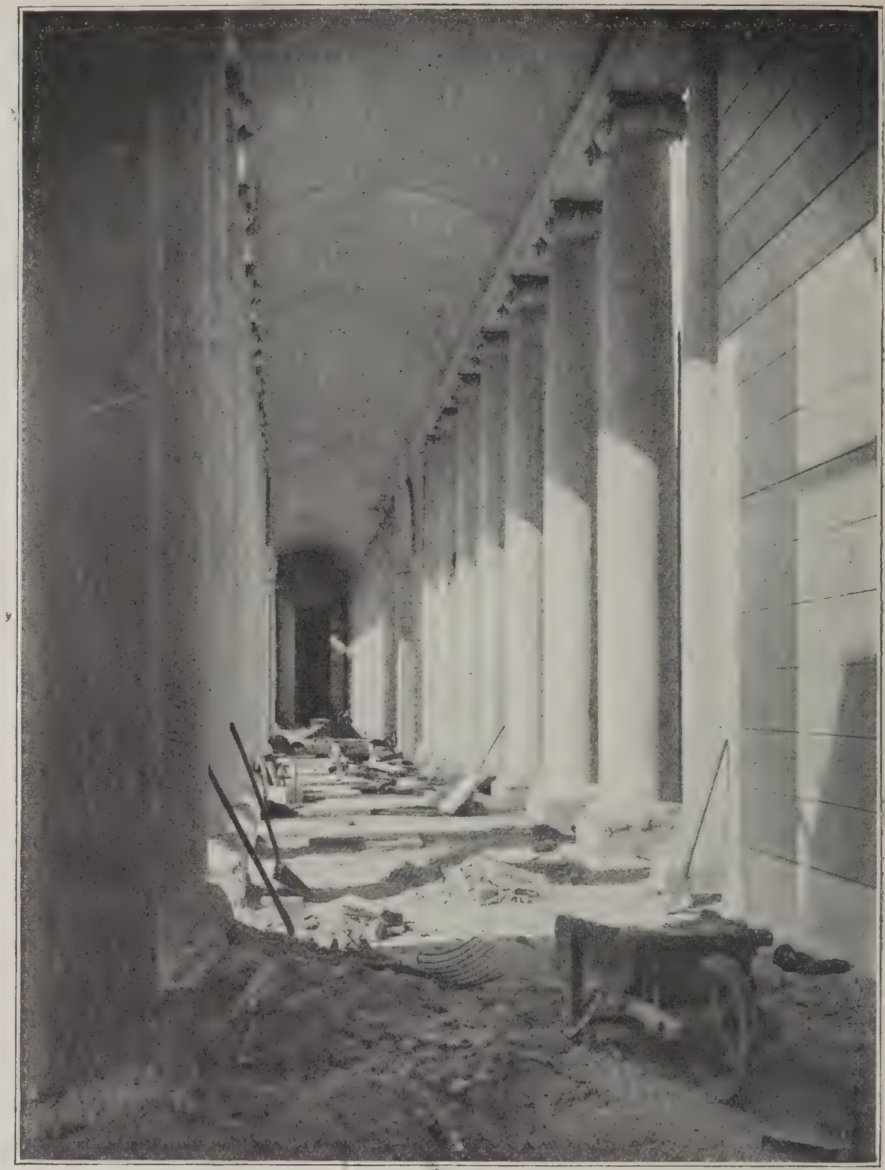
Architects of the Day.

1.—Messrs. Mewès and Davis.

(Concluded.)

As an artist possessed of great decorative instinct, Mr. Mewès has been recognised since his early student days, and examples of his matured powers in this direction are to be found in all of his numerous works—in the masterly treatment of such rooms as the dining-room of the Ritz Hotel in London, in the charming character of the little shop of the artist-goldsmith, Lalique, in Paris, in the clever handling of the staircase hall of the bank in Zurich, and again in the magnificent interiors of the steamships of the Hamburg-America line: *Kaiserin Auguste-Victoria*, *König Wilhelm II.*, *Cleveland*, *Cincinnati*, and *Amerika*, the latter in collaboration with Mr. Davis. In perhaps no other way can the taste of an architect be so quickly and accurately gauged as by a study of his designs for interiors, and especially of those interiors where ample funds are at his command, and he has practically a free hand to make the room as rich and elaborate as he sees fit. It is much more difficult to treat a rich room with restraint and dignity than one where much of what appears to be refinement is in fact due to insufficient funds to pay for any elaboration.

The costly work entrusted to Mr. Mewès and the way in which he has treated it in every instance, especially the interiors, and notable among these interiors those of the great steamships, displays a taste at once rare, refined, and robust. What, for instance, could be more charming than the ladies' room of the SS. *Kaiserin Auguste-Victoria?* Yet, what large handling, and how very simple in its scheme! We have only to think of ships out of number where the idea of using trellis as the form of decoration for some room has been adopted; but in how many instances is it either refined or knowing? In most instances it has been carried out by a decorating firm which has "adapted" a design for an iron grille or painted decorative panel to *treillage*; and the wood has been sawn, twisted, bent, and carved to "adapt" it to the lines of a ductile material or form suitable to be executed only in paint or plaster.



COLONNADE, CHATEAU DE ROCHFORT-EN-YVELINES (SEINE ET OISE).

CHARLES F. MEWÈS, ARCHITECT.

There is something about a ship that conjures up to the imaginative mind all sorts of childhood dreams—pirates, great figure-heads, and lanterns, treasure, great supplies of fruit from tropical climes, sea monsters, dolphins, red and yellow sails, coils of rope, strange forms and all that is picturesque, indefinite and extraordinary. It is probably due to this fact that we owe much of the weird ornamentation that does so much to make one feel that the ocean liner is the modern monster of the sea. To find a designer throwing all this aside and regarding his problem in design as that of a temporary residence, sanely recognising that most steamship passengers do not wish to be reminded of the fact that they are on the ocean, is extremely rare. Yet this is exactly what Mr. Mewès has done. His designs vary from those for a house on land only so far as the different lines of construction make necessary. There is no attempt at wild originality, no pose of "genius"; throughout the whole is thoughtful, masterly design studied after the styles of the most scholarly epochs of the Renaissance in France—the periods of Louis XIV. and XVI., and the best of the First Empire.

For purity of character in design we have an admirable example in the great Chateau of Rochfort-en-Yvelines which, as with all Mr. Mewès' other works, reveals high scholarship. Nowhere is there a break, a bungling of a corner, or a part of the plan which does not work out perfectly; nowhere the suggestion of ignorance that so often accompanies the "original" composition. This is not a composition for which much originality can be claimed, for it is frankly a restudy of the Hôtel de Salm, now used as the Palais de la Légion d'Honneur in Paris. There is nothing about it that has the least suspicion of the experimental, unless it be the dome over the circular salon overlooking the terrace, which is the least successful thing about the design. One must regard it rather as a French work of art than as an idea developed solely by a given artist. In planning and in homelike character it has advanced beyond and above its model, corrected its venerable shortcomings, eliminated its principal faults.

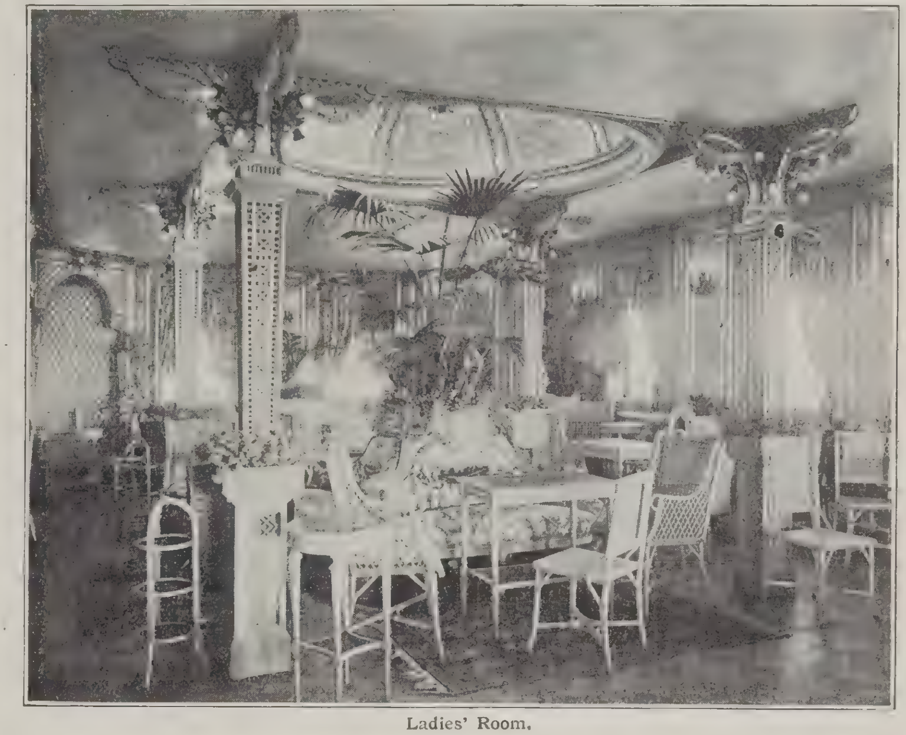
Little, if anything, except mediocrity, is even wholly original with one person; most *efforts* at originality are mere debasements of an original which is the result of the advancement of a standard of excellence through decades, or even centuries, by earnest men working along similar lines, inspired by a like conceived ideal.

Most great originals result from the attempt to do what many others have attempted to do, and in succeeding in doing it better than it has previously been done. The Chateau de Rochfort-en-Yvelines is an original work in the sense that it carries the study of beauty of proportions and fitness to its purpose a step farther than its prototype, and in plan a mighty step still farther. This is an unusual thing to take place in modern, at least very recent, work in any country, though many of the best buildings in the Teutonic and Anglo-Saxon countries are the result of such studies. Taking one of these as an example, one may ask, for instance, of the Travellers' Club—perhaps the finest architectural design in Pall Mall—whether it is equal to the Pandolfini Palace, and a copy of it, or only an inferior imitation of Raphael's fine design; or, on the contrary, an improvement by an architect of *not* greater power and skill than the famous Italian painter, but with the advantages of modern training and more advanced thought having to deal with the same problem and solving it in substantially the same way, but in more exact and refined terms. One may ask the same question of such buildings as the Boston Public Library, the Madison Square Garden Tower and the "Herald" building in New York—to mention only three of the best works of the last quarter-century on the other side of the Atlantic. These all belong to the great school of pure design, as well as being designs of a pure, chaste character. It is unfortunate that the terms purity, innocence and ignorance as applied to design are commonly confounded. Purity in design is not ignorance, neither is it innocence, but as in morals only taste in the choice of one's adventures and experiences. It is just this taste in the selection of a subject from which to work onward, that we observe in the design built at Rochfort. It may be objected that an architect of the ability of Mr. Mewès ought to be able to compose—and that he *is*, undoubtedly, able to compose a design of a more individual character; that the probability is that the client selected the model by demanding a house like the Hôtel de Salm; that he—the architect—did the only thing possible for him to do—make as near a faithful copy as possible under somewhat modified conditions. Such objections would probably be sustained. It is when the new conditions are taken into account, when we note the number of opportunities to depart from the example and lose or improve upon it, and find that these opportunities have been invariably taken advantage of to materially improve the design, we recognize this to be the work of no mere copyist, but of a very analytical and synthethic mind, trained and observant. Thus, the slight heaviness of the orders in the Court of Honour is eliminated, and also the weakness due to the colonnade forming a porch at either side of the central block behind the entrance portico. In the old building this weakness is accentuated by the unfortunate manner of turning the internal angle, in the new it is avoided by bringing forward the wall line to that of the return of the colonnade, which becomes an engaged order. In the old, the scale of the colonnade is lost by the use of a very high balustrade, and a needless attic over the entrance portico gives a heavy and public character to this feature; in the new, these are both substituted by a blocking course which serves the ordinary purpose of a balustrade, and the important scale and more domestic character result. In the old structure the round *salon* is towards the Quai d'Orsay, on an approximate level with the street; the principal horizontal shadow—that under the architrave—cuts the building in halves (for the dome counts with the entablature of the order), and the engaged columns are too widely spaced to be quite happy in effect: the result of the whole is too low to be quite pleasant. These defects do not appear in the building at Rochfort. Over the projecting *salon* the dome is made lower, and the colour so affected by the covering that the white tone of the stonework extends from the terrace to the roof; the surrounding colonnade is made up of two additional bays, the window openings are longer and more graceful. This study and improvement extend to the *motifs* and details throughout, and the whole is enhanced by being set upon a high terrace. The wall of the terrace with its low colour-tones gives a pleasant transition between the regular lines of the building and the rugged effect of the ground upon which it stands. From the Court of Honour terraces and gardens the dark line of roof above serves only to emphasize the beauty of the walls below; but from a distance the skylights, chimneys and dormers produce an effect that is the one jarring note in an otherwise remarkably fine monumental modern country house.

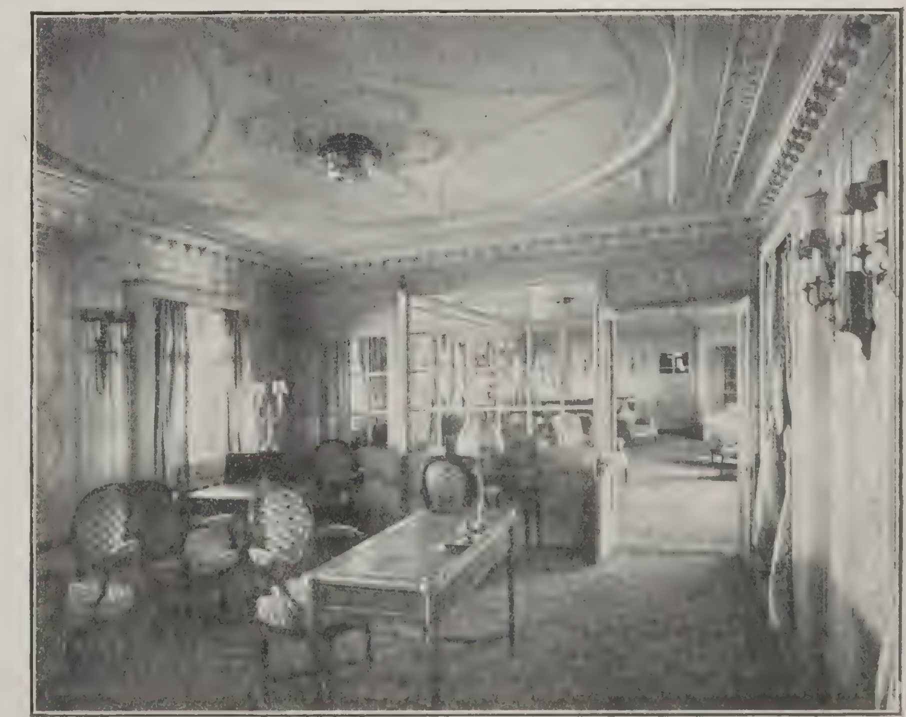
The Chateau de Rochfort-en-Yvelines is, as will be seen from the illustrations, a very large building; and very large buildings, especially when they are country residences, present great opportunities for the man of talent, and we may expect a great deal that is interesting; little things are often more difficult and their defects are more immediately noticeable; but if we turn to the little town house of M. Guitry, in Paris, we find the same thoughtful treatment, the same direct, simple management of the parts, and a kind of personal charm which is always so pleasant in a building small enough for the observer to take in the whole design at a glance.

In the bank at Zurich, which is a straightforward strong-looking commercial house, there is the same primary element of magnificent simplicity; a clean firm elimination of the superfluous.

Besides his partnership with Mr. Davis in London, and his own practice in France, Mr. Mewès has another partnership, with Monsieur Alphonse Bischoff, who makes Cologne his home and business centre and attends to the works by the firm in Germany of which the more important include the large town houses of Baron von Oppenheim at Cologne, Mr. Warburg at Hamburg, and the Hotel Esplanade, also at Hamburg.



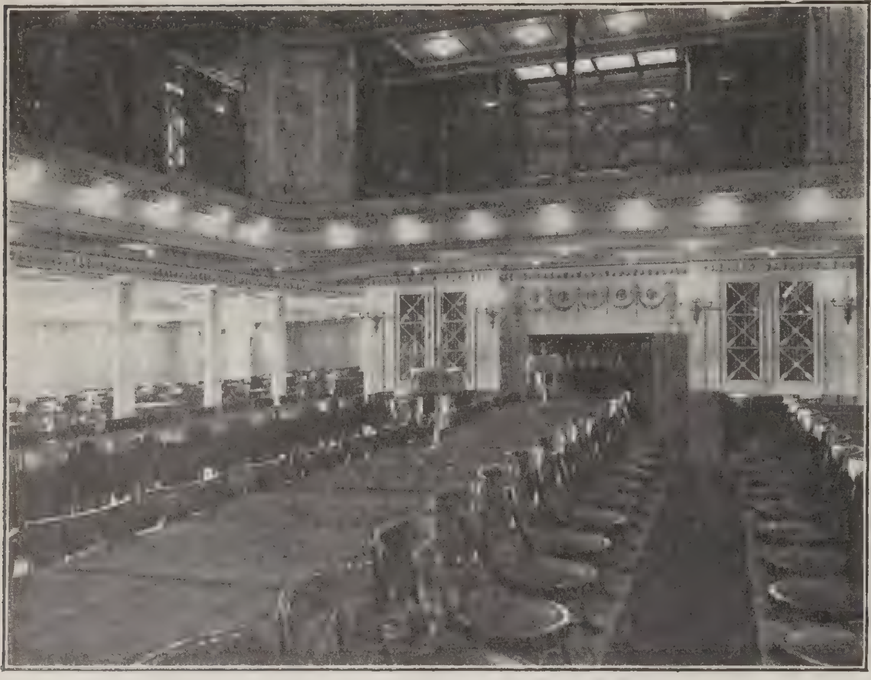
Ladies' Room.



Writing Room.

DECORATIONS, S.S. "KAISERIN AUGUSTE-VICTORIA," HAMBURG-AMERICA LINE.

CHARLES F. MEWÈS, ARCHITECT.



Saloon.
S.S. "KAISERIN AUGUSTE-VICTORIA," HAMBURG-AMERICA LINE,
CHARLES F. MEWES, ARCHITECT.

ARCHITECTURE AT THE ROYAL ACADEMY.

Generally speaking, the one hundred and forty-first exhibition of the Royal Academy of Arts and Sciences is decidedly dull; and it cannot be said that the Architectural Section of it rises above the general level. There are few things of merit, and not very many of interest; still, as of yore, the walls are adequately covered. The most interesting and forceful exhibit, "Israel and the Law," Mr. J. S. Sargent's big decorative lunette painting, is not in the architectural room, but in Gallery VIII., and intended for the Boston Library, U.S.A. In the architectural room Mr. Lutyens' works will inevitably attract attention, No. 1410, "New West Wing, Temple Dinsley, Herts," is a severely simple but pleasing facade in brick, quite characteristic of its author. No. 1411, "Garden view of a house at Ilkley," shows Mr. Lutyens in a new vein, and is an attempt, apparently, at a French chateau treatment. The introduction of classic detail does not come quite happily, however; the chimney stacks are rather coarse, and the general effect is somewhat restless. More successful than either of these is the facade in Kingsway (No. 1487). There are details in the composition at which one might cavil, but on the whole the design is dignified and meritorious. Mr. Belcher sends two water-colours of houses, Nos. 1436, a stone "House at Bampton, Oxon," and No. 1440, "Tatmore Place, Herts." The last-mentioned, in brick, appears almost commonplace; the manner of presenting both buildings in distant bird's-eye views precludes, however, a just appreciation of their architectural merits. In a fine drawing by Mr. Gascoyne, Mr. Dawber shows an interesting scheme for a Surrey house (No. 1429), and the same architect has a large pen-and-ink drawing of the rebuilding of Nether Swell Manor (No. 1467). Mr. Ernest Newton has a water-colour (No. 1435) and a pen-and-ink sketch (No. 1459) of Ardenrun Place, Surrey, a rather ambitious yet successful work. Mr. Voysey's incursion into Gothic detail in the little stone house at Coombe Down, Bath (No. 1450), will interest many. The small windows seem rather in the nature of a *volte-face* for this architect, and the oriels are too small in proportion. A finely drawn piece of detail for Bank premises, Okehampton, by Messrs. Horace Field and Simmons (No. 1451), raises hopes that are only partially fulfilled by the general view of the same building (No. 1546). "The Knoll, Leicester," is a quiet piece of Elizabethan design by Mr. W. H. Bidlake, shown in two views (Nos. 1424, 1447). We might here say that the separation of different views of the same building is a mistake in hanging. It occurs several times this year. Messrs. Buckland and Farmer show an interesting house (No. 1419), a village in the Elan Valley (No. 1369), and a Hostel for Women Students at the Birmingham University (No. 1365). The architects very rarely disappoint one, and this year their work is distinctly enjoyable. Messrs. Baker and Masey's Rhodes Memorial, Cape Colony (No. 1490), a well-ordered classic composition, is disappointing. It hardly appears cyclopean enough for the situation or for Watts's "Physical Energy"; and less of the orders and more of the Titanic treatment shown us in various Bismarck memorials by German architects would have been in better keeping. Mr. Lucas's design (No. 1521) for a club facade in ferro-concrete, doubtless a reminiscence of a recent competition, does not strike us as being very happily suited to the material. It would be most difficult and expensive to construct the shuttering for the construction of such a front. Mr. Flockhart's premises, No. 180, New Bond Street (No. 1533), is a clever piece of design shown by a good sketch; the projecting centre bay seems likely, however, to over-balance the frame of the building. Messrs. Lanchester and Rickards's design for the Reformation Memorial at Geneva (No. 1553 and 1595) is rather unfairly skied. It is a capable piece of town planning portrayed by Mr. Rickards's vigorous pencil, and deserves a better place. Mr. Walter Tapper's monumental chapel for the Community of the Resurrection, Mirfield (Nos. 1567 and 1578), shown by two very fine drawings by Mr. Charles Gascoyne, will add to his already high reputation for ecclesiastical work. Mr. Eustace C. Frere shows two small works at Leyton, Nos. 1402 and 1584, so slight that their merit lies mainly in the author's exceedingly clever water-colour method. Mr. R. Weir Schultz's Cathedral Church of All Saints, Khartoum (Nos. 1607 and 1610) will elicit general interest. It is a plain cruciform building in rough ashlar, with a pantiled roof, and has no reminiscence of any particular style. The exterior depends upon simplicity and scale for its effect; the rather florid design for a Garrison Church at Khartoum, near by, suffers in consequence. Two designs in the room we fail to realise the particular purpose of. They are apparently sketched out in ordinary writing ink, and then worked over with unpleasant washes of dirty yellow, which has the effect of blurring all the lines and the additional effect of making them painful to look at. In fact, this method of presentation is so irritating that it precludes any examination of the intrinsic merits of the designs. An ambitious scheme for the rebuilding of Clifton College Chapel by Sir C. A. Nicholson, Bart. (No. 1625) completes our survey of the noticeable exhibits, but we must not omit, in passing, a mention of Mr. A. Gilbert Scott's design for the Glamorgan County Hall (No. 1525). It is not classic architecture, and has no resemblance to County Hall; but is, nevertheless, an interesting and fascinating study. The ability to use steel joists hardly excuses, however, such extraordinary intercolumniation.

Views and Reviews.

Maid of Orleans Commemoration.

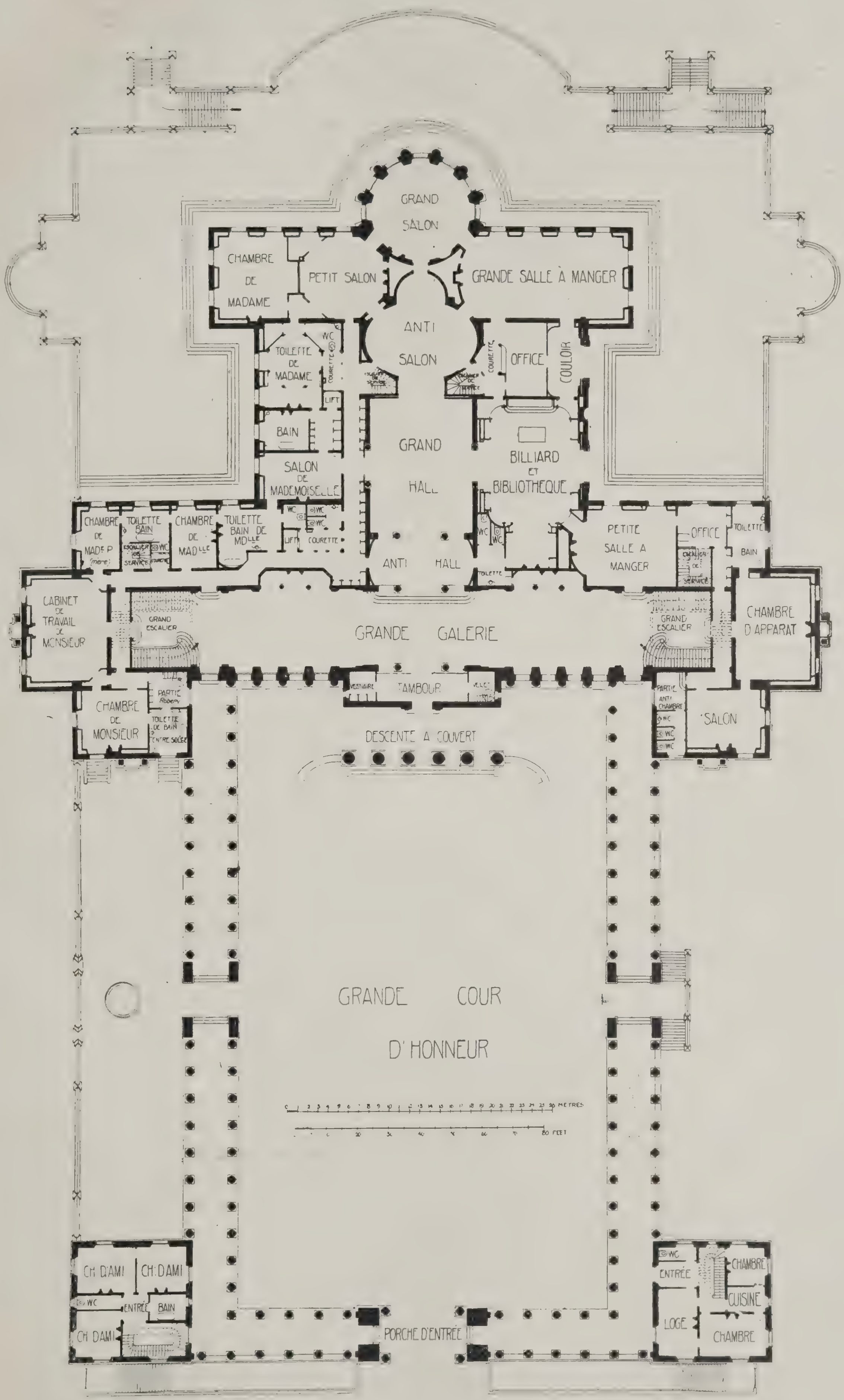
The Blessed Jeanne d'Arc, Maid of Orleans. Written and illustrated by work of the Artists of the Bromsgrove Guild, Worcestershire, England. Printers and Publishers, Allday, Ltd., the Shakespeare Press, Birmingham. Price 1s.

This is a sixteen-page quarto booklet, produced with appropriate chastity of taste, and embodying a brief but withal somewhat rhapsodical account of the meteoric career of the "glorious maid." It has been published at the wish and with the consent of the Archbishop of Westminster in connection with the important religious ceremonies and solemnities for in Rome the beatification of the Maid. The booklet is adorned with excellent pictorial reproductions of commemorative statuettes, medallions, and badges, that have been designed and made by the Bromsgrove Guild. The most important of these is the statuette showing Jeanne holding across her breast in her open palms the sword of Fierbois. The others respectively show her riding into Rheims, and kneeling ecstatic among her sheep in the fields at Domremy. On the reverse of both these medals is a representation of Westminster Cathedral.

Building Construction.

"Practical Building Construction," by T. P. Allen. 5th edition, revised and enlarged. Price 7s. 6d. net. London: Crosby Lockwood and Co., Stationers, Hall Court, E.C.

We are pleased to see that the appearance of the latest edition of this work shows that an appreciation exists of what is, on the whole, a sound treatise on building construction. The author, on the title page, states that the handbook is designed for those preparing for the Surveyors' Institution and similar examinations, and there is no doubt that a complete mastery of the subjects dealt with would enable any student to face such an ordeal with confidence. Particularly is this so in regard to the chapters on carpentry and joinery, which are especially complete both in the letterpress and illustrations. A chapter on fireproof floors is well up-to-date, many of the latest methods of construction being explained, and the necessary details shown by well executed diagrams. The chapter on sanitation is perhaps the least satisfactory, and the author has here made one or two curious slips. For instance, it is stated that baths, lavatories, and w.c.'s should, besides having traps immediately under the fitting, discharge into the open air directly over a gully. This is certainly the practice for baths, lavatories, and even sinks, but the idea that w.c.'s should also be treated this way has long since been exploded. If now seen, it will only be a relic of a system that was out of date at least fifteen years ago and which never attained much vogue. Other similar points might be noted, which are somewhat misleading, but they detract but little from what is generally an excellent work, both for the student and for the purpose of reference.



CHATEAU DE ROCHFORT-EN-YVELINES (SENE ET OISE): PLAN. CHARLES F. MEWES, ARCHITECT.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
June 1	MOLESEY ISOLATION HOSPITAL. The East and West Molesey U.D. Council invite competitive plans, with specifications for the above. Full particulars can be seen at the Council Offices, Dundee Villa, East Molesey.
June 4	COTTAGE HOSPITAL, BODMIN. Architects are invited to submit competitive designs for the above, to be erected at an approximate cost of £2,000. Premiums, £12 12s., £8 8s., and £5 5s., for the three sets of plans *which the Committee may select.* Premiums of selected Architects to merge in Commission. Site can be seen on application to Henry D. Foster, Hon. Secretary to the East Cornwall Hospital, Bodmin, from whom particulars are to be obtained.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading. Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second, and third respectively. Assessor: Mervyn E. Macartney, F.R.I.B.A., F.S.A.
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	WALLASEY U.D. COUNCIL. CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

National Welsh Library, Aberystwith.

Professor Reginald Blomfield, A.R.A., has accepted the assessorship in the above competition on the nomination of the President of the Royal Institute of British Architects.

Willoughby v. Technical Journals (1902) Limited.

At the Assize Courts, Manchester, on Wednesday, April 21st, before Mr. Justice Walton, the case of Willoughby v. Technical Journals (1902) Limited, was mentioned.

Counsel for the Plaintiff: Mr. L. Langdon, K.C., and Mr. Gordon Hewart, instructed by Messrs. Boote, Edgar and Co., Manchester.

Counsel for the Defendants: Mr. Tobin, K.C., and Mr. Hugh Fraser, instructed by Messrs. Bull and Bull, of London.

Mr. Langdon: My Lord, in this case I appear with my learned friend, Mr. Hewart, for the Plaintiff, and my learned friends Mr. Tobin and Mr. Fraser appear for the Defendants. I am happy to say that neither your Lordship nor the Jury will be troubled to hear this case, because seeing the course the Defendants have taken a trial is, I am happy to say, rendered unnecessary. This was an action for libel appearing in a most important publication called "The Builders' Journal and Architectural Engineer," a journal that circulates broadcast amongst architects and builders, and has not only a wide circulation but a deservedly important influence. In that journal, under circumstances which, I daresay, Mr. Tobin will explain to your Lordship, there appeared, on January 13th last, a letter from a correspondent, and an anonymous correspondent. Unfortunately that letter contained grave aspersions on the professional capacity and the integrity of my client, Mr. Willoughby. Mr. Willoughby is a gentleman who has practised as an architect here in Manchester for some 26 years. He is a Fellow of the Royal Institute of British Architects, and is also a Fellow of the Manchester Society of Architects, and in that capacity he has discharged important work as an architect, and has also been called upon to adjudicate on many important matters as an assessor between architects. Naturally, when this letter appeared, attacking him in the way it did, it wounded his feelings greatly and was calculated to do him the greatest of harm amongst his professional brethren and the trades which are connected with them, and these proceedings became a necessity, and they have been taken. I am happy to say on behalf of the Defendants that they have recognised the gravity of the position in which they have placed Mr. Willoughby, and they are willing, through Mr. Tobin, to express their regret and apologise to Mr. Willoughby for what they have allowed to appear in their paper. More than that they consent through Mr. Tobin that, as a substantial mark of the wrong they have done the Plaintiff, and in an endeavour to repair that wrong as far as they can, there shall be judgment for the Plaintiff for 500 guineas and costs.

Mr. Tobin: I appear for the Defendants (with Mr. Fraser) who are the proprietors of "The Builders' Journal," and as Mr. Langdon has stated, it is a paper of very high standing and reputation amongst members of the profession amongst which it circulates. It is read by a great many builders, architects and engineers throughout the length and breadth of the country, and anyone looking at its issues, any of them, will see that its articles are regularly most serious and earnest articles, and anything like a libel is absolutely and wholly alien to its character. In this case the letter complained of was communicated to the paper by a correspondent. It was received in hot haste of going to press, and it was inserted by absolute inadvertence. The directors, when they saw the letter, when it was complained of, at once recognised, as gentlemen, that there was only one honourable course for them to pursue, and that they do pursue in this case. They say, through me, that the statements are wholly unfounded. They have never sought to justify those statements from the very first, and in the frankest and fullest way they express their regrets, and tender to the Plaintiff their sincere apology, and the proprietors of the paper further desire to say this, as showing they are anxious to do what they can to put the matter right, that they propose to report in two successive issues of their journal what I am now saying on their behalf, so that everyone who read the original letter complained of may have a reasonable opportunity of reading this withdrawal in Court to-day. I only wish to add that there has never been on the part of any of the proprietors of this paper, or in the minds of any of their staff, the smallest personal feeling against the Plaintiff. On the contrary, there have in previous issues of this journal been articles laudatory of the Plaintiff's work. The Directors feel, and authorise me to say, what I have now said on their behalf, and they have taken a proper course and a dignified course in this matter.

Mr. Justice Walton: I quite understand. The statement you have made expressed properly what they have done. They seem to have made an unfortunate mistake, but there is no suggestion that they did it maliciously. It was a mistake calculated to be injurious to the Plaintiff, and I think they have taken a proper course.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Base for Cast-iron Stanchion.

TRING.—A CONSTANT READER writes:—"A cross-shaped C.I. stanchion, 9ins. x 9ins. x 15ft. high, carries a load of 50 tons. Calculate a proper base plate if the ground is good gravel. Would a concrete base be sufficient, and what should be the dimension of concrete to resist this load?"

If the ground is good gravel, a safe pressure of 5 tons per square ft. may be allowed. This makes the necessary area of concrete block $= \frac{50}{5} = 10$ sq. ft., say 3ft. 3ins. square. Assuming that the concrete is best Portland cement concrete 1 to 4, a safe stress of 15 tons per sq. ft. can be allowed, thus making the necessary area of the base plate $\frac{50}{15} =$ 3.33 sq. ft., say 22ins. square. The usual thickness of this plate would be about 1¾ins. This plate must be sufficiently stiffened by ribs; or, as an alternative, the stanchion might be provided with a plain base and be bolted on to a ribbed cast-iron stool about 8ins. high, and tapering to 22ins. square at the base. The thickness of the concrete block should be about 18ins., this being about twice the amount of overhang of the block over the base-plate. If the base-plate is designed as indicated above, the concrete base would be sufficient. A.

Capacity of Cylinder.

HEREFORD.—H. C. writes:—"How many gallons are contained in a cylinder, 5ft. 6ins. in circumference, 4ft. 6ins. high, which has an overflow pipe 3ins. below the top? Also, how would you find the number of gallons if it was a square or oblong tank, instead of a cylinder?"

A cubic foot of water contains 6.23 gallons of water. A gallon of water occupies 276 cubic inches, or nearly 0.15 cubic foot. A gallon of water weighs 10 pounds, at 62 degs. F. A pound weight of water occupies 26⅔ cubic inches. To find the area of a circle, multiply its diameter by itself, and that product by 0.7854; or, multiply the radius by itself, and that product by 3.1416 (πr^2). A circle 5ft. 6ins. in circumference has a diameter of 1ft. 9ins., and a radius of 10½ins. Having found the area of the cistern, in either square feet or square inches, multiply the area by the net height of the cistern, 4ft. 3ins., and either divide this product by the number, 276, of cubic inches to the gallon, or, if you have calculated in feet, multiply it by the number, 6.23, of gallons in a cubic foot of space. Had the cistern been square or oblong, the process is the same, i.e., find the cubic contents, and then the gallons contained by these. Your cistern contains 10.2 cubic feet, 635 pounds of water, and 63.5 gallons. You will find full information about water in "Specification" INGENIOR.

West Walton Church.

PRESTON.—J. M. C. writes:—"Could you give me a short description of West Walton Church, Norfolk, or inform me where I could get the same?"

A full description of West Walton Church appeared in "The Builders' Journal," Vol. 92, page 711, and further illustrations on page 752 of same volume. Measured drawings were published in the A.A. Sketch Book of 1887, a sketch of the tower has appeared in "John o' Gaunt's Sketch Book," and sundry details of carving and ornament in Colling's "Gothic Details." G.

Books on French Cathedrals.

LONDON, S.W.—"CLOVIS" writes: "What guides and books, architectural and otherwise, are published (preferably in French), on the Cathedral Church of Rheims or Reims in the North of France? I have already Miltoun's 'Cathedrals of Northern France,' and also Bumpus' book on the same subject. Is there a book by the late Mr. Le Duc on this subject?"

Probably the "Histoire et Description de Notre Dame de Reims," in two volumes, by Ch. Cerf, published at Reims in 1861, will suit your requirements. Flodoard's "Histoire de l'Eglise de Reims," may also be useful, and references occur in Viollet le Duc's Dictionary of Architecture. G.

Reinforced Concrete.

LONDON, S.W.—"FER." writes: "Do the terms 'ferro-concrete' and 'reinforced concrete' refer to two different systems of construction? I have maintained that the two titles are different names for the same system of constructing in concrete and steel, but am told that there is an actual difference; one term signifying one system, and the other another."

The term "reinforced concrete" is the larger term, including "ferro-concrete." The latter is the term adopted by the proprietors of the "Hennebique" system, and, this being one of the earliest introduced into this country, the term "ferro-concrete" has been since rather loosely and indiscriminately applied to reinforced concrete in general.

Sea Sand for Concrete.

T. E. writes: "Referring to my query published in your issue of March 17th, and the answer thereto, I desire to say the question was asked in all seriousness, and therefore not 'writ sarkastic.' Knowing that the sand on our sea coasts varies to some extent in its sharpness (if you will allow me, for the moment, to ignore your interpretation of that term), it would have been very interesting to me, for other reasons than mere curiosity, to know where the material of sufficient sharpness as to allow of the term being applied, is to be found. As you seem to imagine you are giving me a 'poser' when you say you would like to know if I can find commercial sand which conforms to my interpretation of the word 'sharp' (which interpretation, by the way, you seem to be well acquainted with, although it was not given), I would point out that crushed rock sand is extensively used for concrete. This sand conforms to my interpretation of the word 'sharp.' Also, pit sand is generally 'sharp,' and termed as such, in comparison to sea sand. Your definition of the expression 'sharp and clean' is to me, I must confess, somewhat vague, and the term is, I venture to think, more often seen worded thus: to be composed of 'clean,' 'sharp' sand. I am aware that sand containing loam, etc., cannot be considered 'sharp,' as the existence of foreign matters tends to destroy the advantage obtained by that quality. At the same time, however 'clean' sand may be, it cannot be considered 'sharp' if the particles are not angular and gritty."

We do not know of sufficient variation in the sharpness of sea-sand to affect the quality of concrete made with same. Our correspondent is apparently trying to split hairs on this point. As regards "sharp" sand, we do not admit that crushed rock sand is extensively used for concrete, and we do not regard it as a commercial commodity. Pit sand, as we said before, has almost all been water-worn, and therefore is not "sharp" in the sense given the word by our correspondent. We can only add that we stand by our previous reply in every particular, and if architects and engineers were to insist upon "clean" sand being really angular, they would greatly increase the cost of any concrete work they had in hand.—Ed. "B.J."

Cast v. Milled Lead.

GREAT YARMOUTH.—A. S. H. writes: "What are the advantages of using old lead recast instead of milled in church restoration? Milled, I have understood, is more reliable than cast. What is the relative cost, taking new lead at 18s. per cwt., between milled and recast lead?"

You are quite mistaken in believing milled lead to be more reliable than cast—the latter, properly used, is more lasting and on all counts much to be preferred, particularly if old material can be re-used in this form. Old lead has a considerable quantity of silver and arsenic in it, which is the cause of the beautiful white oxide which forms on it. Modern lead blackens owing to its desilverisation. Cast lead is more easily dressed than milled, and is therefore preferred for bossing up. Its lasting properties are probably due to the preservation of the natural hardened skin lost in milling. Old lead is often as thick as 12lbs. to the foot, and owing to its liability to sand flaws and inequalities of thickness in casting, should not be used less than 6lbs., but as milled lead of less weight than this is not likely to be used in church work, this is no disadvantage. The relative cost of milled and recast lead, weight for weight, should present little difference if a good plumber is employed to do the work. It would, of course, be recast on the site on a wood table with a sand bed and projecting curb, on which a cross-piece or "strike" is slid up and down to gauge and level the molten metal. G.

Depreciation.—Compensation.

NO ADDRESS.—NO NAME writes: "(1) What is a fair depreciation per annum to allow on a house, just built at a cost of £230? (2) Being employed by a limited company, and having private work to do for the directors at their private residences, what would be a workman's position (should an accident occur to him whilst so engaged) under the Compensation Act?"

(1). If the house is well built and is of freehold tenure, there should be no depreciation; provided, of course, that it is always kept in repair. If it is a leasehold, depreciation must be reckoned in accordance with the length of the term for which it is held; no immediate allowance for depreciation need be made unless the unexpired term of the lease is less than for sixty years. (2). The position of the workman entirely depends on his "employer" at the time the accident occurs—if the Limited Company pay his wages, then they alone are responsible. but if the director himself pays the workman's wages (he only having temporary leave of absence from the Company), then the workman would have to look to the director personally for compensation. F.S.I.

Royal Academy Schools.

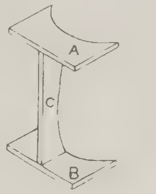
CROYDON.—S.W.S. writes: "Can you give me any information on the standard of the examination for entrance of architectural students to the schools of the Royal Academy. Are the questions (and answers) published? I have full particulars of what is required for admission as probationer, but want a more definite knowledge of what is required for admission as student in the two subjects of examination: perspective and architectural history."

Full particulars of the subjects required in the examination for entrance to the Royal Academy Schools may be obtained on application at Burlington House, W. (Apply to the secretary, Royal Academy School of Architecture.) As the number of vacancies is limited, and the number of candidates variable, the standard is necessarily also somewhat variable and competitive; but we may state, as being of some guidance to the standard, that a candidate who has passed the intermediate examination of the R.I.B.A. and prepared the usual drawings required as testimonies of study for the final, would probably have no difficulty. The examination is held in January annually; questions are not published; the subjects of design and perspective drawing are similar to those set in the various qualifying architectural examinations. B.B.

Entasis in Plastering.

CHESTER.—CESTRIA writes: "We have a large number of iron columns to case in breeze concrete, and finish in Parian cement. Could you oblige us by saying which you think is the quickest way of applying the finishing coat? The base is octagon, with a mould run round the top of base, from this mould to capmould the circular shaft has a slight entasis. Which is the quickest way to form and finish the entasis? Can you suggest a better way than by hand?"

This is more a question for a practical plasterer, but apparently the best way to deal with the swelled portion would be to form the circular mouldings above and below it in the usual way, and then to make a template as in the illustration, and work up the entasis by hand. The parts A and B can be passed round the circular moulding while the part C gives the form for the entasis.



HENRY ADAMS.

Tenant's Fixtures.

DUBLIN.—H. G. L. writes: "I should be glad if you could inform me if a wooden framed building erected by a tenant on concrete foundations is in law the property of the tenant or of the landlord, in case of the lapse of a lease or of the landlord taking over the property for any reason."

The removability of a building, or part of a building, which has been erected by a tenant depends entirely upon the degree to which it has been affixed. If it has been so built, or secured, as to have become, practically, a part of the freehold, it has become the property of the landlord, and cannot, therefore, be removed by the outgoing tenant. In the case you mention, I am of opinion that the tenant is legally entitled to remove the wooden superstructure but not the concrete foundations. F.S.I.

Steel Roofs.

LAVENDER HILL, S.W.—BOLT writes: "What governs the number of holding-down bolts to be provided to the feet of the rafters in a steel roof? The horizontal component of the reaction usually works out to one bolt, or less, but often four are used."

As far as calculation goes, the horizontal component of the reaction is the only factor that determines the number of holding-down bolts used. One bolt cannot, however, be used unless it can be placed behind the vertical plane as the roof, and this is not a good practical arrangement; for this reason two are usually used, one on each side of the rafter. Although four bolts are often used where two would do, there does not appear to be any important reason for this arrangement. A.

Assistant to Municipal Body.

WESTCLIFF-ON-SEA.—ENQUIRER writes. "Would there be much chance for an architectural assistant (age 31) of securing employment with an urban district council or district council as assistant or assistant surveyor, if he passed the necessary examination, but did not serve his articles in such an office? I would also like to know what are the qualifications required, and if there are likely to be many openings if one did qualify. Would the associateship of the R.I.B.A. be any use in making application for a post of this kind, and what are the most useful examinations to pass? Where can the necessary coaching be obtained?"

These appointments, especially for the more highly paid officials, although often advertised, are generally given to men whose training has been in similar surroundings. Apart from this preliminary training, we should say the Surveyors' Institute examination or the Statutory examination to qualify as district surveyor in London or building surveyor under local authorities (next examination October, 1909), would carry more weight than the R.I.B.A. associate examination in this particular sphere; shorthand is also often a most valuable recommendation. Information as to coaching for the above examinations is best obtained from the various educational agencies whose addresses appear herein in the educational columns.

B.B.

Loss of Light.

NEWCASTLE-ON-TYNE.—E. G. writes: "The enclosed sketch plan (not reproduced) shows three adjoining houses (back parts only), and I am the owner of the middle one, numbered 41 and B. Above the scullery shown I intend erecting a bath-room. The existing party wall dividing A and B, and forming the wall of my scullery, is the point in dispute. Owner A says I cannot raise this wall any higher to form my bath-room, on account of the light to his kitchen window. Now owner C has a bath-room exactly in the same position as I am intending to place mine, and my contention is that I have good light in my kitchen, despite this bath-room wall of C's, and consequently I hold that owner A will have as much light in his kitchen as I have in mine. No work for remuneration is carried on in his kitchen, consequently all the light he can claim is a reasonable amount. (1) Must I obtain the consent of owner A before I can carry the party wall any higher? (2) Also if he refuses consent can I legally carry up my own 4½ feet and add another 4½ feet to it, so as to give me a 9 feet wall on my own ground? I may say the City Council have already sanctioned the plans as sent in. The wall in question will be about 8 feet higher than the existing party wall."

You are quite right in supposing that no damages for loss of light can be recovered by law unless the loss is real and actual, and not of merely a theoretical or fancied character, and you are equally right in thinking that the loss of light to a kitchen would not legally be regarded as being so serious as would be the case if the room were used for manufacturing purposes. From your sketch plan I should say that the loss of light in this case will be inconsiderable. The answers to your questions are:—

(1) Yes; neither party may raise the wall so as to increase the burden upon it, or interfere with his co-tenant's uses, without permission.

(2) Yes, if the party wall stands equally upon your land and upon that of your neighbour. You own one-half the wall, and so does he, and each has a right of support to his own half from his neighbour's half.

F. S. I.

Partnership.

YORKSHIRE.—PARTNER writes: "On what basis is a partnership between two young architects and surveyors usually arranged? 'A' has been in practice about four years and has a fair connection, and 'B' wishes to join him. 'A' is a good designer, but not by any means practical, whilst 'B' is very practical and a good land and quantity surveyor, which knowledge 'A' lacks. 'B' has had exceptional opportunities of superintending works in progress, both public and private. How would the amount of money to be put into the business by 'B' be arrived at, and how should the work of the office be divided to render the partnership fair to both parties?"

A somewhat similar question was answered on page 95, Vol. 26, of "The Builders' Journal." In this instance, however, the circumstances rather alter the case. Presumably an equal partnership is contemplated—in that event the sum of money to be put in by the new partner should be half that requisite to purchase the practice—say, two years' purchase, calculated on the nett profits. No hard and fast division of the office work will be possible; naturally each partner will undertake the work most suited to his capabilities. A proper deed of partnership should be drawn up by a qualified solicitor, and provision made therein for the eventuality of a future dissolution.

G.

Sign on Drawings.

LONDON.—PARCHMENT writes: "What is the meaning of the mark, similar to a letter S, drawn on the boundary lines of plots in drawings? I have noticed it on plans of sites attached to agreements and other legal documents."

The sign S to which you refer, when found upon a plan is merely a bracket, and means that the properties on both sides of the line (across which it is marked) are communicating, or are both included in the one area.

F. S. I.

Public Works Department.

DEVONPORT.—A. K. writes: "Where can I find information relating to the Public Works Department other than that of India and the qualifications necessary for entering it?"

We are not sure whether our correspondent refers to the Public Works Department of Ireland and the outlying parts of the Empire, *e.g.*, for the Anglo-Egyptian Government of Egypt, etc. There is a regular syllabus for the former department, consisting of composition, architectural drawing and details, quantities, estimating and specifications, building materials, sanitary science and survey and levelling. The whole staff, however, numbers only about a dozen men. Applications to sit for examination must be made to the Civil Service Commissioners. Indeed, it would be best to apply to the Commissioners at Burlington Gardens, W., for detailed information, which varies from time to time as circumstances arise. They will also supply information as to the English Office of Works, for which examinations, covering much the same syllabus, are frequently held, although the vacancies are extremely limited. Past examination papers can be obtained from the Civil Service Press, 27, Chancery Lane, W.C., post free, ½d.

B.B.

Floors for Dancing.

TRICHINOPOLY.—E. B. writes: "Could you give me instructions how to construct a dancing floor set on springs, or let me know of any books containing this information?"

I have seen several designs for dancing floors on springs, but not one that was based upon reasonable principles. The majority of this class are arranged so that the bearers which carry the floor joists rest upon volute springs. The motive force, however, to cause the springs to work is not the weight upon the floor, but the change of weight, and this is infinitesimal when the floor as a whole has to be taken into account. To be effective, the boards themselves should be upon springs, so that about one spring to each couple dancing would come into action individually. I know of no practical method of doing this, and recommend an ordinary floor with shallower joists than usual to reduce their stiffness, and placed further apart to allow the flooring to spring, the strength being secured by the thickness of the joists and the jointing of the floor boards. Such a floor for a room 80ft. by 40ft. would be given by the arrangement shown herewith in plan Fig. 1 and section Fig. 2.

HENRY ADAMS.

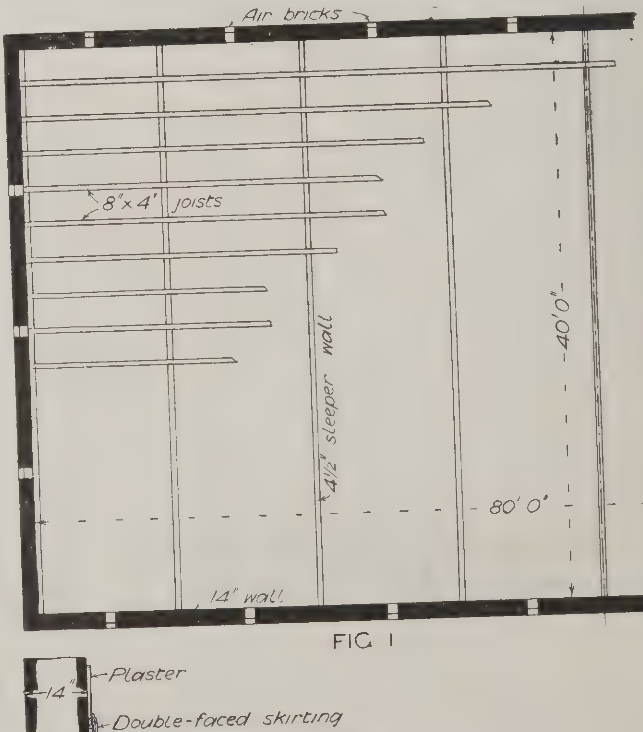


FIG 1

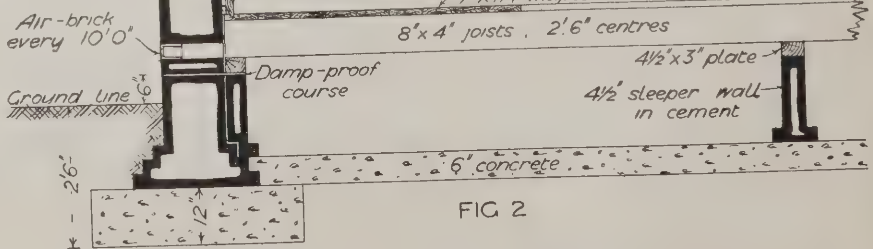


FIG 2

ILLUSTRATING REPLY TO TRICHINOPOLY.—"E.B."

CONTRACTORS' SECTION.

(MONTHLY.)

DRY-ROT AND LEGAL LIABILITY.

By a Barrister.

Cases have recently come before the Courts which serve to show that the question as to who is liable for the dry-rot which sometimes breaks out in the woodwork of a building is not by any means easy to determine. Incidentally it necessitates the solution of the problem:—For how long does a builder or an architect remain liable for defects which appear after completion? This is a question to which it is by no means easy to give a short and satisfactory answer. One may look through all the clauses of a most carefully drawn contract without finding anything which places a time limit upon the liability of the builder. True, a maintenance clause frequently provides that he shall be liable for a definite period to maintain and repair; but the contract is generally silent as to the relative rights and liabilities of the builder and building owner after that period has elapsed.

The question under discussion most frequently arises in connection with what are known as *latent* defects.

But a latent defect may not become patent for years. Some error in building may cause the foundations to give way; some departure from the specification may have led to the use of improper materials. Finally, dry-rot may break out under the floors to such an extent that the entire woodwork has to be renewed. How far, then, can the builder or architect be held responsible?

It will be convenient to discuss this question on the present occasion with sole reference to the occurrence of dry-rot. This is a latent defect, which may only become manifest after the elapse of a considerable period of time. If it can be shown that the occurrence of dry-rot is due to some breach of contract on the part of the builder, it is manifest that he must be held liable.

Building contracts may, for the present purpose, be divided into two classes: (1) contracts in elaborate form, in connection with which there is an architect employed and which are drawn in some such form as that recommended by the Royal Institute of British Architects. (2) Contracts in which the work is done without the intervention of an architect, but in accordance with specification.

The discussion may best be opened by considering some common data which may be conveniently generalised in the form of the following assumed case.

A builder was employed to add a new wing to a house. The contract and specification provided that a layer of cement concrete 6ins. thick should be put under the floor of the hall and passages, and that a patent damp-proof course should be laid beneath all woodwork both in the outer walls and in the sleeper walls. Work and materials were to be approved by the architect of the building owner, who was named in the contract. The house was so situated that the ground floor was below the level of the soil of the upper part of the garden. The builder did the work; but before it was completed and before the final certificate was given, there were symptoms of dry-rot in the woodwork under the ground floor. An attempt was made to put this right before the final certificate was given, and a deduction was made on account of it. Eventually the architect granted his final certificate, and the builder left the work. A year or two later the floor began to give way, and on its being removed it was found to be extensively infected with dry-rot. Upon investigation it was found that the ventilators were blocked up with chips and shavings; that there was no damp course on some of the sleeper walls, and that a portion of the concrete under the hall had been omitted. It was also found that the soil beneath the wood floors for which no covering layer of concrete had been specified was damp. The local building by-laws provided that a layer of cement concrete should be placed underneath all wood floors, but the local authority did not enforce this by-law very strictly.

In such conditions, who is to bear the loss occasioned by the dry-rot?

First, as to the position of the building owner. It is clear that unless the appearance of dry-rot is an evil which may occur in any building however well designed and constructed, the building owner may be entitled to lay the burden on the builder or the architect. This is because a building owner is entitled to rely on the professional skill and judgment of those who undertake to do work for him. The architect must exercise reasonable care and skill; and if there is an omission from the specification of some elementary precaution which would account for the growth of the mycelium of dry-rot, it is conceived that this would be sufficient to fix both the builder and the architect with liability.

It appears, however, to be accepted doctrine at the present time that it is not every building that is liable to be affected by dry-rot. The disease only occurs when there is bad ventilation or when, owing to some defect of construction, damp is able to reach the woodwork. In the circumstances of the case above stated, with whom does the responsibility rest? If the dry-rot broke out owing to the absence of concrete beneath the floor, that was not the fault of the builder, for concrete was not specified beneath the rooms but only in the hall and passages. If, on the other hand, the dry-rot began and spread owing to the absence of a suitable damp course, that was the fault of the builder, because he should have complied with his specification. In the circumstances, the incidence of liability could only be ascertained by bringing an action against the builder and architect jointly.

The plaintiff in such an action would be beset with certain grave difficulties. The builder might certainly shelter himself behind the final certificate of the architect. The work was to be done to the approval of the architect, and how can that approval be better expressed than by the final certificate which practically authorises the builder to demand the balance of the contract price from the building owner? So far as the absence of the concrete is concerned, that is a matter for which the builder is not responsible. Moreover, on the particular data of the case assumed, the builder could plead by way of defence that the dry-rot was discovered and in fact eradicated before the final certificate was given at all.

Next let us consider the position of the architect. Assume that the dry-rot was due partly to the absence of concrete beneath the floors and partly to the absence of a proper damp course. Could the architect be blamed on either or both of these grounds?

It is manifest, in the first place, that the two things are entirely distinct. The absence of concrete under the floors was a matter which depended upon the design of the building. The absence of a proper damp course was primarily due to the negligence of the builder, although it might incidentally have been due to the negligence of the architect in not supervising the builder and seeing that he carried out his contract.

First as to the liability of an architect for a negligent design. It is extremely difficult for a charge of negligence to be brought home against a professional man for what may really be an error in judgment.

The doctor does not guarantee a cure; the lawyer does not undertake that he will win a case; the architect does not guarantee that he will bring the very highest degree of skill to bear upon the work for which he has been employed. The building owner could only hope to succeed on this head of negligence as against the architect by showing that, in the opinion of members of his profession, he omitted to specify what was a reasonable precaution. This of course is not an easy task to perform, having regard to the natural reluctance of one professional man to testify against another.

It is nevertheless clearly one of the duties of an architect to supervise the work during construction, and to see that the builder complies with the specification. If bad work is done and concealed from the architect, it is no justification for him to say that the builder did it without his knowledge. The clerk of the works generally supervises the details of a contract, but where there is no clerk of the works employed, the architect's duty as supervisor becomes all the more onerous.

There is authority for saying that if an architect omits to see that the builder complies with the specification, or covers up bad work, he may be held liable for negligence.

Thus the fact that an architect may be held liable for negligence in passing bad work is illustrated by a case where the plaintiff employed a builder to build a house for him in accordance with certain plans. The builder was to be paid on the certificates of the defendant, who was the plaintiff's architect. The defendant certified, and the plaintiff accordingly paid the builder. This action was then brought by the plaintiff, who alleged that in consequence of the defendant's negligence in superintendence, the house was not built in accordance with the contract. The jury found a verdict for the plaintiff.

The fact that an architect may be held liable for dry-rot has been clearly established in the Scotch case that is recorded in "Emden's Building Contracts," 4th ed., p. 78. There a builder was employed to build a house to the specification of the defendant, an architect. No clerk of the works was employed. Many months after the completion of the work the whole ground floor became infected with dry-rot. The building owner made a claim upon the builder, who denied all liability. He then brought an action against the architect claiming damages for negligence. The Court of Session in Edinburgh held that the architect was liable.

In the course of the judgment in that case, it was stated that:—"To some extent an architect is an artist—that is, as regards the design and plan. But for the rest, his work is just ordinary tradesman's work—drawing specifications and supervising the work. He is not supposed to do all the supervision personally. His substitute can do much of it as well as he can himself, but if he undertakes to do it he is bound either to do it himself, or to have it done by some person whom he employs in whom he has confidence. I think the meaning of the contract is that he shall see that the work is done well before he certifies it."

So much for the liability of the architect. In a case where there is no architect employed, the problem assumes a somewhat simpler aspect. The builder then acts as skilled adviser, as designer, and as superintendent of the work; and if an outbreak of dry-rot can be shown to be due to any default on his part, he can be held liable in damages. There is one recent authority on the point. In the case of *Grove v. Judge*, "Law Times Journal," Feb. 13, 1909, p. 333, an action was brought in the Watford County Court to recover damages from a builder. It appeared that in 1905 the defendant built a house for the plaintiff. No architect was employed. The house was completed in July, 1905, when the plaintiff entered it, and continued to live there until September, 1908. In that month the floor gave way owing to dry-rot. The outbreak of this was alleged to be due (1) to improper damp-course; (2) the laying of damp course below the level of the soil; (3) covering up of ventilators; (4) laying of damp-course below the level of the woodwork. The County Court judge came to the conclusion that the damp course was not, in fact, laid at the proper level, and that the ventilation was defective. He also held, upon the evidence, that the outbreak of dry-rot was due to these causes, and declined to accept the suggestion that the use of linoleum on the floors when laid was the cause of the mischief. In the event, he entered judgment for the plaintiff.

Finally, there is recorded at least one case in which both architect and builder were held jointly liable for an outbreak of dry-rot.

In view of these decisions, which appear at first sight to be at variance, it is difficult to lay down any general principle, or to solve the problems presented to us by the facts of the case mentioned in the early part of this article. An architect has been held liable; a builder has been held liable; and both together have been held liable. How, then, shall a building owner decide who is to be sued? This is an important question, because an abortive action means heavy costs. It is one which can only be answered after all the facts of the case have been ascertained and carefully considered.

SCAFFOLDING AND APPLIANCES AT THE BUILDING EXHIBITION.

By A. G. H. Thatcher.

Recollections of several past building exhibitions prompt one to turn to the various devices in scaffolding and the patented appliances connected therewith. The result always forces one conclusion, that impermanent as such structures are the ideas put forward for their improvement are still less lasting. Ladders, cradles, boats, lashings, cripples, and safety appliances have all been shown in the past, but whether due to faults in their construction, or to the well-known conservatism of the trade, their life on the whole appears to be limited in duration. The exhibition that has just closed has had this branch of the trade fairly well represented, and although little that is novel has been shown, much of interest has been placed before possible users and hoped-for purchasers.

Perhaps the most striking and most novel exhibit was the power winch shown by Broom and Wade, Ltd., of High Wycombe. It consists of an ordinary barrel hoist, as shown in Fig. 1, with a small petrol motor fitted to one of the A sides near the base. Its utility is undoubted, and for small jobs where fairly heavy loads have to be carried or where speed is a desideratum its use would be an advantage.

The same firm also supply a winch fitted with drums of different diameters for rapid and combined hoisting and lowering. It was originally known as Fishburn's, and its continuance over several exhibitions proves it to be one of the few exceptions that have caught on with the trade.

Several cripples are shown, but only two possess any idea particularly striking. The first of these, Fig. 2, was shown by Mr. Edward Leigh, of 85, Tamworth Road, Croydon.

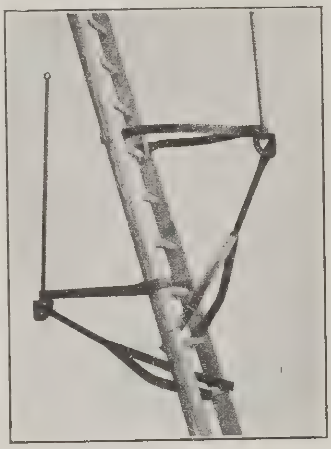


FIG. 2.

In this arrangement the weight when fixed is partly carried by the ladder sides, but it has the added advantage of being supplied with a guard rail. Cripples though useful are somewhat dangerous to work from, and the platform they carry is narrow, 18ins. at the most. Any method, as this, of increasing their safety, especially in these days of compensation, is to be sought for.

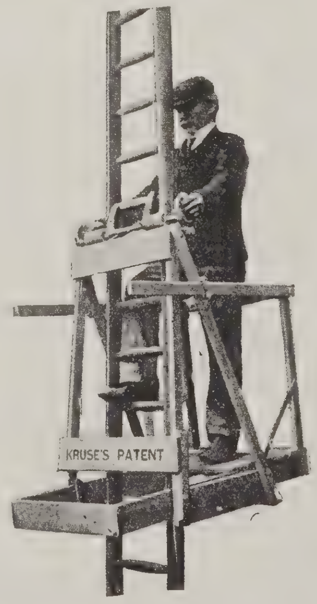


FIG. 3.

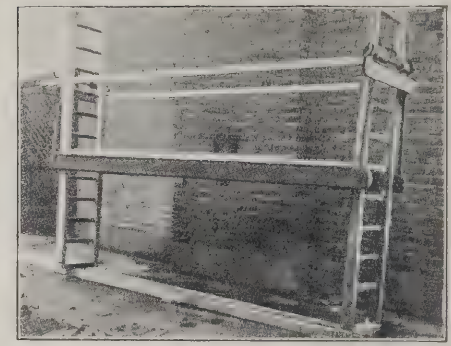


FIG. 4.

Kruse's patent has a similar purpose, but is constructed of timber. For working in, the element of safety is again considered and made plain. Unlike others it forms a platform in itself, and by any workman conversant with its use is readily raised or lowered. It is certainly a step in the right direction.

The clip to the ladder rungs is also used by the patentee to build a scaffold as shown in Fig. 4. It is raised and lowered in a similar manner to the cripple itself, two men of course being necessary in this case.

A cripple fixed to the top of an ordinary step ladder is also shown. This certainly increases the platform room, but the tops of steps are not so safe to work from, the centre of gravity being high in proportion to the stability of the structure.

Of appliances to take the place of the hempen or wire rope as a scaffold connection, there seems to be no end. Many such have been introduced into this country from abroad, and it always appears to be a tempting theme for practical ingenuity. One of the latest and certainly one of the best is that supplied by the Patent Rapid Scaffold Tie Co., of 124, Victoria Street, Westminster. Its use is illustrated by Figs. 5, 6, and 7.

Its good qualities are rapidity of fixing and rigidity afterwards. No wedges are needed, and any tightening is easily effected by an ordinary spanner. The loose nut is bossed on so that it cannot be lost. The chief disadvantage is its weight, a ledger connection weighing with the chains about 6½lbs. This compares unfavourably with the hempen or wire cord, mostly where cartage is concerned. The immense strength it gives may easily be taken to be of more value than this, especially for heavy work.

FIG 8

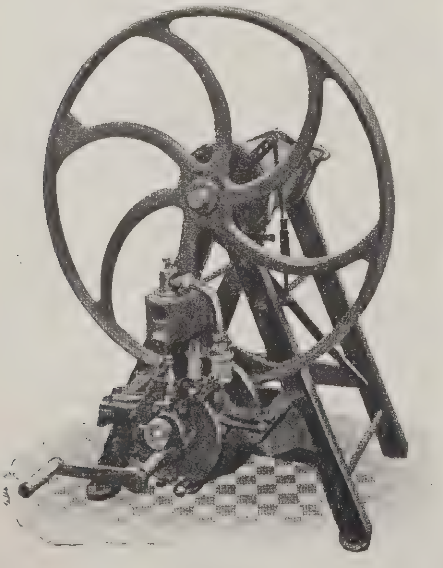
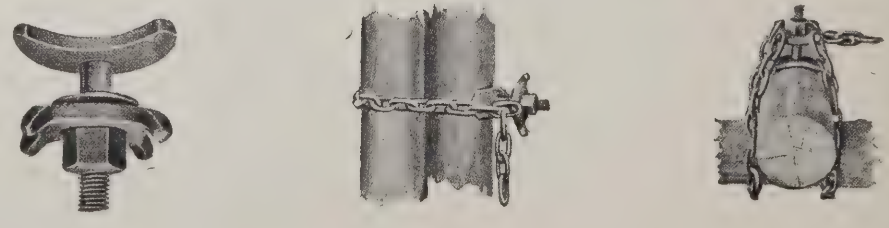


FIG. 1.


FIGS. 5, 6, 7.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

CHATEAU DE ROCHFORT-EN-VOELINS.

(SEINE ET OISE). CHAS. F. MEWÈS,

ARCHITECT.

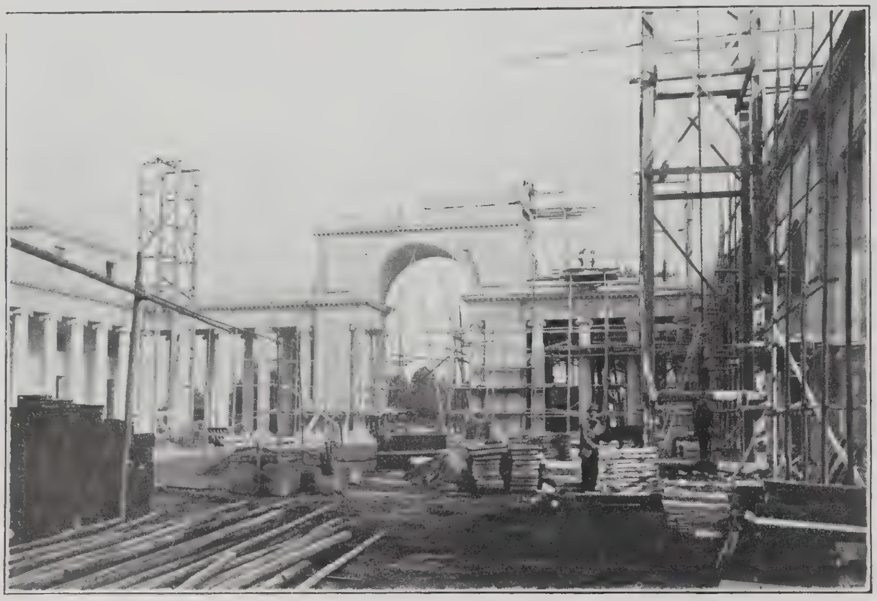
Views (left to right).

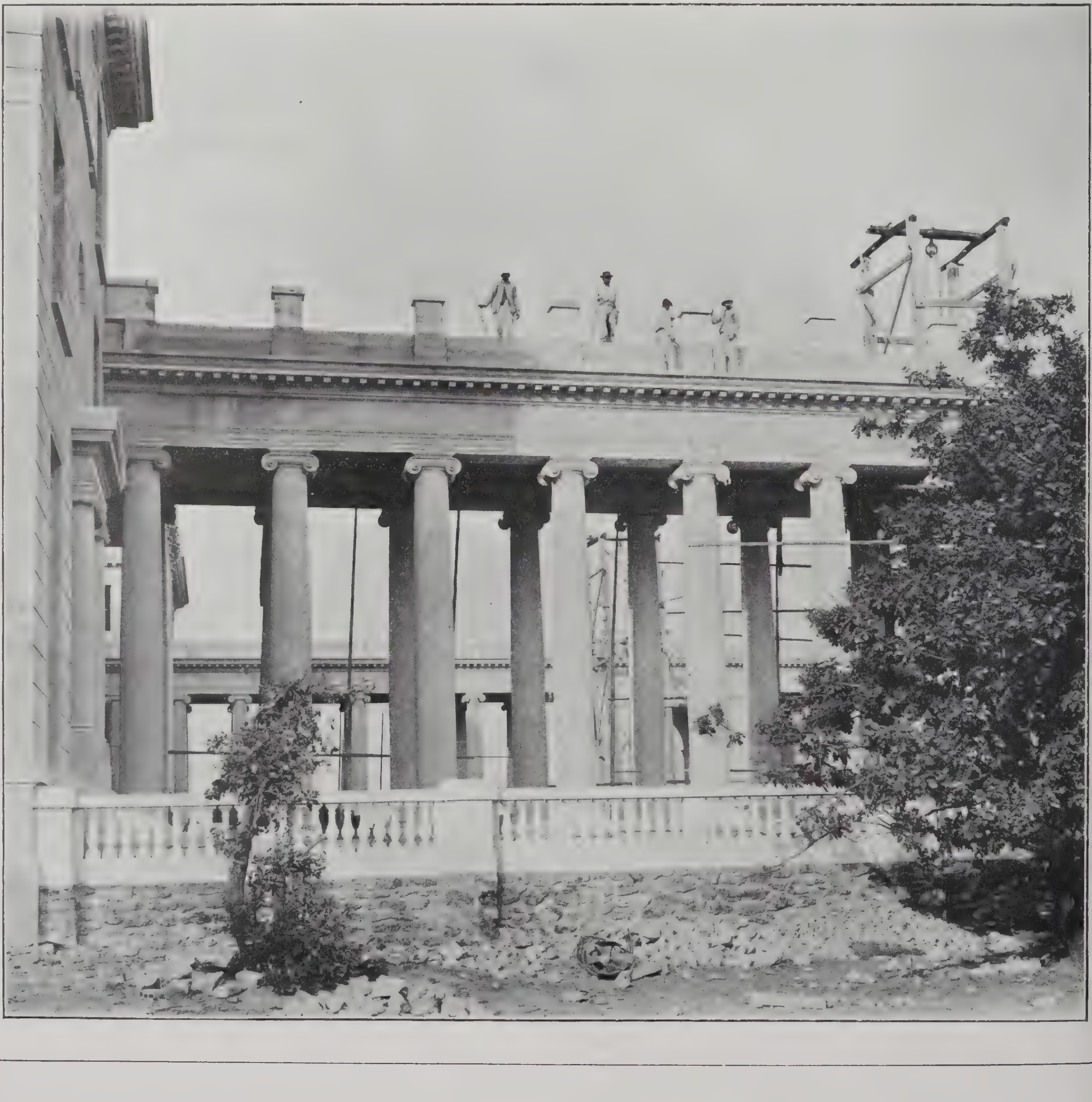
1.—Entrance to the Court of Honour.

2.—General View.

3.—The Colonnades bordering the Court of Honour.

4.—Entrance Portico.





For the bracket supplied by the same firm (Fig. 8) it is claimed that by its use one scaffolder can fix the ledgers, but the safe handling of poles on a scaffold usually demands the services of two men.

Messrs. Stephens and Carter, of Green Street, Paddington Green, show amongst other exhibits a safety basket as Fig. 9.

The iron hoop built in the construction prevents the handles and bottom tearing out, a danger that is often present with an ordinary basket that is at all worn. The cost is practically the same as when made in the usual way, so that there can be no real objection to the improvement.

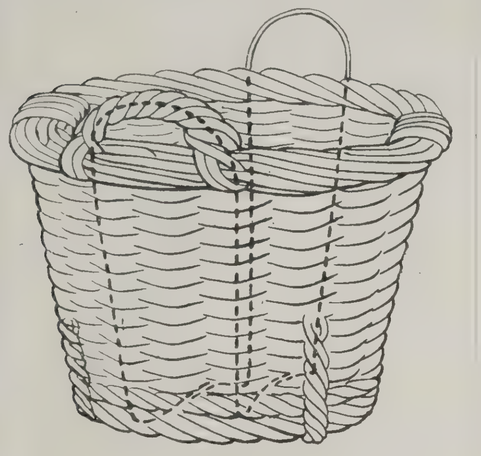


FIG. 9.

The Clipper Plank clamps by W. T. Nicholson and Clipper Co., Ltd., of Salford, are useful to join planks in their run without any support from beneath.

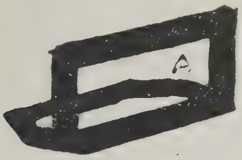


FIG. 10.

The boards are passed through the aperture A (Fig. 10) forming a lap, and any superincumbent weight causes the iron to grip and keep them in position. They serve a useful purpose and if placed in the centre of the span which the boards bridge, give the greatest strength where it is required. Their use would prevent such an incident happening as was recently noticed on a building. A workman finding a single board of insufficient strength to support him, lined it, not with a single board but with two, and *butted them to meet in the centre of the span.*

The proposals of the Master Joiners and Builders' Branch of the Manchester District Building Trades Employers' Association in reference to working hours and wages have been substantially rejected by a vote of the men. The masters' scheme proposed that the time for starting and finishing be so adjusted that the week during March, April, May, June, July, August, September, and October, equal 49⅜ hours; for November and February, 44 hours; and for December and January, 41⅜. Other stipulations were:—That the wages be 9⅜d. per hour; the boundary circle with a radius of two miles from Albert Square as a centre; and as to "country work," that all men sent out of the district and lodging away from home, should receive 3s. 6d. per week and travelling expenses out-and-in once a week.

The members of the 40 branches in the district, comprising some 3,000 members, were asked to vote on the issue, and sufficient has been ascertained to justify the declaration that the masters' terms have been repudiated, save a proposal dealing with train fare and kindred expenses in lieu of the 3s. 6d. per week allowed by the old rules.

Matters of Opinion.

II.—The Taxation of Land Values and Its Effect Upon Building.

In the preparation of the present year's Budget, which the Chancellor of the Exchequer introduced last Thursday, it had been rumoured that a further projected tax upon land as a means of meeting the present deficit was rejected, as the estimated yield was too poor to warrant the introduction of such an impost. That this was not the case is made evident by Mr. Lloyd George's statement which provides for three taxes on land. In response to numerous requests from builders and others we had decided to open our columns to a discussion on the subject, based on the Glasgow Bill, of some two years ago, which sought to rate land for Municipal purposes. Mr. Horsburgh's paper, which follows, is based upon the proposals of the Glasgow Bill, and was accepted by us as a preliminary criticism on these proposals for the purpose of eliciting opinions and suggestions from builders and other interested, it being one of the contentions of those who support land value taxation that it will tend to stimulate building. Needless to say this is an aspect we cannot ignore. Mr. Horsburgh's criticisms on the question of developed properties in towns must be mitigated as regards the Budget scheme, under which such properties will only be subject to an occasional impost when things are "booming"; but his criticisms regarding undeveloped land apply also to the Chancellor's proposals, and the whole article holds good as regards municipal rating, the supporters of which are not likely to be satisfied or pleased by the Chancellor forestalling them.

It may be helpful to state here the Budget proposals as regards land, which Mr. Lloyd George has explained in greater detail to one or two newspaper representatives since his speech in the House of Commons. To "The Westminster Gazette" he stated the three taxes as follows:—

"The first is an increment tax. All the land in the Kingdom will be valued at its present value. That is the first operation. If it increases in value subsequently, then, either on transfer or at death, the proposal is that the State should secure 20 per cent. upon that increment.

"The second is a 10 per cent. tax on the determination of a lease. When a lease falls in, not merely does the land revert to the landlord, but the house as well. The 10 per cent. will be charged on the difference between the interest which the landlord had in the land before the date of the lease and that which he has acquired on the expiry of the lease. In fact, he pays 10 per cent. on property which he has acquired without expenditure.

"The third is a tax of one-halfpenny in the £ upon undeveloped land. This is practically a tax upon vacant building sites which have acquired a special value owing to their being near a town or village, and upon mineral rights. There seems to be some misapprehension as to this. It is not altogether a tax on mining royalties in form, but it is in substance. The royalties received by the landowner in respect of his interest in the mine are evidence of the value of the minerals which have not been raised and which are still underground, and I have no doubt a valuer would take them into account when assessing the price which he should put upon the landlord's interest in the property.

"The first two are growing taxes. They will produce a minimum this year, but they will grow heavily. Our anticipation is that they will assume considerable dimensions, as we are basing our estimate on the prospect of land appreciating in this country owing to the growth of population and the spread of wealth."

In the "Daily Mail" of Monday last, the Chancellor has given some further explanations. Asked whether the new tax of a halfpenny in the pound on the capital value of undeveloped land would apply to places of public recreation—race-courses, cricket grounds, football grounds, golf links, tennis courts, and playgrounds, Mr. Lloyd George stated that it would apply to all undeveloped land which has a special building value, unless that land is thrown open to the public on reasonable conditions. A good many gentlemen with private parks near a town, throw open those parks to the people under fair restrictions for the protection of their amenities. A special exemption had been made in cases of that kind. As to racecourses, a clear test will be applied. If the course is private property, with a distinct building value, and if the proprietors make money out of the land, they will be liable to pay. Epsom Downs, being always open to the public, would probably escape. Many of the racecourses in open country referred to have no special value as building sites. Where they have, then, of course, they are liable to the tax. But the land must be worth more than £50 an acre to begin with. That rules out all poor land without a special building value.

"The conditions defined will apply equally to cricket grounds and football grounds and golf links. They will not apply to public playgrounds, nor even to private playing grounds when the proprietors give reasonable free access to the public for their enjoyment."

The definition suggested a further question to the interviewer. Lord's and the Oval, the Chelsea football ground, and all other football grounds in the middle of large towns—these have a distinct special building value, they are worth more than £50 an acre, and they are not open to the public for enjoyment except when the public pay for admission. Are they liable to the tax?

Mr. Lloyd George replied that it depended entirely on whether they came under the head of "public amenities," and that point will be decided in each case by the Commissioners of Inland Revenue. There are certain open spaces which it would not be in the public interest to build upon, and these will be exempted. But to ask about any specific instance would be like asking a judge to give his views on a case before it had been argued.

Another question was: What is implied by "or other purposes" in the text of the resolution for the land value duty:

> An annual duty in respect of the capital site value of land which has not been developed for building *or other purposes*, and the capital value of ungotten minerals, at the rate of one halfpenny for every pound of that value.

Mr. Lloyd George replied to the effect that a resolution cannot be taken as expressing a substantial definition of one's proposals. All it does is to give a kind of comprehensive authority for introducing a Bill which deals with finance. Therefore, one makes one's resolutions as wide as possible. What is said about this particular resolution applies to them all. Property may be developed for a good many purposes which could not be described as building. It is desired to cover in the exemption all cases in which the land is fully used for a legitimate purpose.

We are open to receive opinions from all points of view, but it must be understood that our attitude is entirely non-committal and that we propose to maintain a neutral position in the discussion. The taxation of land values is either of importance to builders or it is not, and upon this we should be glad to hear from the builders themselves.
—The Editor.

THE TAXATION OF LAND VALUES IN TOWNS.

By Victor D. Horsburgh, A.R.I.B.A.

The stoutest upholder of "things as they are" could not for a moment maintain that our present system of rating is perfect or even decently just. On the contrary, a little reflection would demonstrate it to be irrational in conception and erratic in incidence. Real and personal property cannot pay taxes, but they are used as the measure of the share that each citizen is required to contribute to the public service. That real property is often a false measure of ability to pay can be easily shown. There may be some degree of reason in taking from the landlord so many shillings out of each pound of rent he receives, because he actually handles the money on which the tax is laid. Often, however, he holds the property under burdens that leave him little or no profit from it. In these cases the Imperial tax passes on, to be borne by those in actual enjoyment of the rent, but his share of the local rates remains on the landlord in full. It is unreasonable, however, to presume that the occupant is able to pay rates on the same sum as the landlord. He does not receive, but pays out the rent and must be poorer in consequence. Our curious laws argue that having paid out money he must be able to pay more. They proceed on the assumption—surely a faint one—that the income or profit will be in proportion to the rent. The inequity of rent as the measure of a tenant's just share of, or at least ability to bear taxation, is becoming more and more recognised. A tradesman paying a shop rent counted in thousands may make an income counted in hundreds, while a business man on the floor above who does not require a shop window may be in the reverse position, making an income of thousands while paying a rent of hundreds.

Origin of the Proposal.

The agitation for the Taxation of Land Values did not arise wholly out of the recognition of such anomalies, but from a desire in certain quarters to secure to the local service a share—some say the whole—of the rise from rural to urban values of land, consequent on the growth of towns. The Land Values Taxation (Scotland) Act, 1906, popularly known as "The Glasgow Bill," proposed that a capital valuation "as between a willing seller and a willing buyer" of all privately owned land in towns, should be made. The land only, apart from the buildings on it, was to be valued. Then an annual value of one twenty-fifth of the capital value was to be assumed, and a rate not exceeding ten per cent. of the latter imposed on owners only. Holders of feu-duties and ground rents were to be included and taxed as owners of ground values. The new tax was to be in addition to the existing rates, and its produce was to go to their relief. The House of Commons referred the Bill to a Select Committee for report. After hearing evidence the Committee reported in December, 1906, condemning the idea of a supplementary tax utterly, and recommending the abolition of the existing rates and the substitution of a tax on Land Value for them. Owners and occupiers were both to be rated on the new standard, and owners of feu-duties and ground rents were included as before. The Committee further recommended that a valuation should be made and considered before a scheme of taxation was drawn up.

This latter recommendation the Government proceeded to carry out, but their Bill was dropped when the House of Lords insisted that the valuation should be optional on Local Authorities, and so the matter rests. Much confusion exists in the public mind on the subject, and no wonder.

Confusing Ministerial Declaration.

In June, 1907, the late Prime Minister threw overboard part of his Committee's scheme by assuring a deputation that existing feu-duties would not be taxed. In March, 1908, the Lord Chancellor jettisoned most of the remainder by a declaration in the House of Lords that to place the rates wholly on Land Value was impracticable, as "it would be eaten up altogether." Meanwhile the Scottish Solicitor-General—then Mr. Ure—has all along insisted that feu-duties must be taxed. These things irresistibly suggest that an overworked Government has not been able to study the matter, but has proceeded on the insistences of a band of enthusiasts.

Supporters of the measure may object to opposition as unreasonable, on the ground that the Government's programme is one of inquiry only. The reply will be to argue that no feasible scheme of rating can follow the valuation. We must credit the taxation party with the belief that there is a workable scheme. That being so, let them declare at least its leading points. Otherwise the pursuit of what may be a mere phantom is working incalculable mischief to our greatest national industry, namely, housebuilding, and that, too, in a time of already severe depression.

Ground Rents and Feu-duties.

That Land Value taxation has been propounded mainly for Scotland is fortunate for controversial purposes. For there a perpetual tenure at unalterable ground rents or feu-duties is practically universal. This raises the incidence of a new tax in the simplest form, and readers can apply the arguments with due modification to the more varied English tenures.

In valuable central streets the feu-duties being old are often nominal and rarely more than trifling in amount. As sources of revenue or sharers of the burden of taxation these old feu-duties may be disregarded. In the suburban districts of the larger towns the original feu-duties imposed by the landowners amount to from £30 to £150 per acre, and on the outskirts of the smaller towns from £5 to £30. The feu-duties of the intermediate areas may be taken as roughly graduated between the low old central and the higher new suburban duties. When flats or rows of houses are built, it is usual, as in the case of ground rents, to place on each house an improved feu-duty averaging throughout the suburbs about one-seventh of the rent. As many of these as are necessary to meet the original feu-duty of the site are handed over to the landowner, and the remainder are the property of the builder. He usually sells them to Trustees, Insurance Companies, Charitable Institutions, and the like, at rates which were as high as 33 years' purchase at the end of last century, but which have now fallen to about 23 years' purchase. In view of the slow rate at which the ample areas of ground offered for building around our towns are being taken up, and in view of the general fall in value of suburban property, it is plain that suburban feu-duties represent the full value—or more—of the land on which they are imposed. That the trifling feu-duties of those long-settled central districts do not represent the land value is equally clear. There are cases where the value of a city property amounts to six or more times the cost or value of the buildings on it. In such cases the remaining five-sixths may, for present purposes, be admitted as Land Value. Computing this annual land value by the Glasgow Bill's method, the result may equal or exceed the rental of such properties as are not fully developed, but will fall considerably short of the rental of those that are so developed.

Probable Sum of the New Value.

Our new ratable value will therefore be suburbs and areas without what might be called a commercial value, one-seventh of the old, and central and commercial areas anything between one-seventh and—let us say, five-sixths of the old value.

Having arrived as best we can at our new ratable value, the problem of its taxation follows. Until an official valuation is made the question is quite open, ministerial declarations notwithstanding. We may lay on Land Value the whole rates, an additional rate, or an additional rate on owners only. The writer believes that the first method will prove impossible, and the others productive mainly of trouble. His excuse for entering on their discussion at all is the danger to all classes in the persistence in a difficult question of economic change, of a body of reformers who seem to be more distinguished for political zeal than for practical instinct in the probable incidence of their scheme. So far as can be seen at present, "the whole rates" are as likely to be attempted as a partial rate. The latter will be touched briefly and the "whole rates" will be argued from mainly, as giving the broadest view of the matter.

The over-all ratable value of each town will then naturally depend on the proportion of centre to suburbs. Facts being meanwhile out of our reach, we can only guess that the limited central areas will not raise the general average to more than one-sixth of the old value.

Effect in Principal Streets.

Now if the ratable value is reduced to a sixth, the rates are naturally multiplied by six. The present rates in Edinburgh including Burgh Assessment, Water (which is on Rental), and Poor and Education rates, allowing for the fact that the latter is charged on four-fifths of the rent only, amount on commercial properties to about 4s. 10½d. in the £. The owner's share is about 1s. 10½d. and the occupant pays the remaining 3s. The unhappy ratepayer who owns and occupies—say, a central shop, will thus be charged 29s. 6d. in the £. Supposing his Land Value to be only two-thirds of his old assessed rent, he will be required to pay a sum equal to nearly 20s. in the £ on the latter. Readers who are ratepayers in valuable central positions in more highly rated towns can apply the figures to their own cases and make the woeful calculation for themselves. While the owners and occupiers of the principal central streets are flying for shelter to side streets or the Bankruptcy Court, the owners of suburban properties will be passing the burden on to the owners of the whole land value in their case—the holders of the feu-duties, and enjoying complete relief from taxation. The occupiers here will also pay under the Select Committee's Scheme a rate six times higher than of old, but on a basis of only one-seventh of the former value. In other words, they will pay a little less.

We can almost hear the reformer exclaim —"Impossible, a 30s. rate can never be imposed." "Impossible," for the reasons stated by the Lord Chancellor we hasten to admit; retorting however, "the result of the basis selected by you in apparent ignorance of its 'impossible' smallness."

Effacement of Land Values.

If the rates were laid on Land Values in Edinburgh the owner would pay 11s. 6d. and the occupier 18s. in the £. This seems sufficient to efface the land value. 11s. 6d. leaves a balance, but the rates of which it is a part are always rising. The more than "willing seller" would look in vain for the "willing buyer," who, knowing that he could not find "willing" tenants to pay their rates of 18s., would transfer his willing buying to some form of property more liquid than land and buildings. If by any chance some marketable Land Value were left here, in towns more highly rated it would be utterly effaced. The community would have appropriated more than half of the annual value, and wasted or suppressed the remainder. No tax on annual value of land can appropriate capital value because it is open to the Government to abolish the tax. Land nationalization once effected would probably endure for all time. But an experiment in taxation is liable to repeal and change. Therefore capital value in land effaced in whole or part by an annual tax would lie dormant merely, to revive in more favourable times. Rates such as these, or sufficient to obliterate the annual land value could only be collected for one year. In the second year no capital value could be returned from which to compute a basis for the tax. The Select Committee's scheme seems intrinsically impotent and self-destructive. Yet potent enough in mischief in its mere discussion by responsible politicians.

A City Example.

The mere valuation of town sites presents difficulties. Taking the case of a fully developed central property of the admitted value of £20,000, the buildings being capable of erection for £4,000, a presumable land value of £16,000 is left. Then the property next door may consist of a site of identical dimensions, containing smaller and older buildings producing only half the rent of the first example. Considering the possibility of future development the value may be as high as £16,000, while the buildings are worth only £2,500. The presumable land value is, of course, in this case, £13,500. The rent of the first property would be about £800 and the second about £400. As the new value is to be that of the land divested of building and certain other improvements, the value of the two sites must for rating purposes be the same. Supposing this mild difference to be adjusted and a land value of £15,000 placed on each, the resulting annual value will be £600. To the apparent inequity of taxing one owner on a sum lower, and another on a sum higher than his rental, the reformers reply that the owner of the less developed property will be forced to develop it to the full extent in order to secure a revenue out of which to meet the tax. They forget that he cannot do this without loss unless there is a market for the additional accommodation, and that even in prosperous times there is no sufficient market to utilize an instant and wholesale building of our streets up to the height limit. Regarding the occupier, this £600 value as a measure of his ability to pay would be a wild shot in the dark. Rent, while it may not measure his profits, does measure his opportunities. The occupier is a party to the rent, but he has no such interest in the Land Value, which measures a comparatively intangible and fluctuating element in another man's property.

Unbuilt Land.

With regard to unbuilt land on the outskirts of our towns, let us consider an average case. A landowner sets aside one hundred acres of land as ripe for building. He has plans of roads and drains prepared, fixes a feu-duty of, say, £50 per acre, and succeeds for a few years of brisk speculation in getting rid of his land at that price to the extent of about five acres per annum. Then a period of depression such as the present time sets in when for years he disposes of little, or no, land at all. Meanwhile he is getting for the unfeued balance an agricultural rent of £3 per acre. No doubt the rating authorities in consideration of the time that must elapse before the unbuilt land can be fued will accept a valuation based on something between £3 and £50—let us say the average, £26 10s. per acre. The high rate that must follow will, to put it mildly, be uncollectable on a revenue of £3. But the landowner will attempt to sell his land rather than feu it and hold in exchange heavily taxed feu-duties. If he succeeds he will walk off with the land value, free and unscathed by this remarkable legislative effort, leaving the tax on the man who has paid that value. Builders of houses in the outskirts of our towns do not—with the rarest exception, pay down the price of the land. They prefer to take it burdened by an annual charge which represents the price. Their finances are based on this custom, and the buyers of their houses find the same system convenient. If owners offer the land for sale only, which so far as we have means to judge, they must, the condition of suburban house-building will be one of paralysis till a new generation adjusts itself to the change. As suburban sites hitherto have been neither bought nor sold there cannot be an actual buyer to serve as a model for the "willing buyer." The latter gentleman must be less than a counterfeit, he must be a mere invention. The value of a built site may be hypothetical in some degree, and more so if a special tax of unknown amount is impending on it. Some value has, however, been demonstrated by a successful development. Our undeveloped site has all its troubles before it. The value is potential and dependent on what the future brings forth; surely a speculative basis on which to place the town's revenue.

The "Willing Buyer" and the "Willing Seller."

The owner of developed sites also, is with us always, waiting to be taxed and to be clothed in the Glasgow Bill's character—the "willing seller," but where is the "willing buyer" in this case? He was here yesterday, he is not here to-day, he may be here again to-morrow, or he may never return. When the valuation is being made we may be sure he will be invisible. He must generally be a mere bogey; an artificial semblance of a willing buyer rigged up by the municipal party to the controversy to uphold their their views.

Land Values Already Taxed.

The fact that land values are already taxed in the case of built land is no longer questioned. Two properties identical in every other respect may be situated in an obscure and a popular street respectively. The higher rental that the latter is rated on can only be accounted for by the popularity of value of the site.

If a tax could be limited to a rate that would leave a land value worth holding and worth taxing; and if the fear of future increase could be allayed,—which are large suppositions—a share of the land value of suburban and unbuilt ground would, doubtless, be secured by a tax. But the tax, if laid on commercial centres, would generally hit the wrong man. The most valuable streets in a town are nearly always the oldest, and the value has been growing more or less steadily since the end of the Napoleonic Wars. That is nearly a century ago, and commercial properties have, on the average, changed hands many times since. Each vendor has presumably walked off with a share of the increment. In cases, however, a present-day owner may be enjoying the whole increase. Perhaps only yesterday one such fortunate sold what had descended to him unburdened from his great-grandfather and secured the land value, or—if you like—the unearned increment in cash. Here we have two men, the buyer and the seller. One, the buyer, has paid out the land value. The other, the seller, has the land value in his pocket. Down comes the tax,—on which? On him of the empty pocket! Fresh students of the question will gasp in amazement; but this is a sober fact, inherent in the scheme no matter how the new rate is divided or limited. Every present owner who has paid for his property will suffer this inequity in a degree proportionate to the date of his purchase. Reformers may urge that the present rates remain with the buyer. The buyer, however, knows this and discounts it in the price, but the recent buyer did not know that a tax—of crushing amount in central areas—was about to descend on him, based on a value which he had parted with to another man.

Will Aggravate Over-crowding.

With unbuilt ground taxed at the same rate as the sites of the neighbouring buildings, projectors of new building schemes will be unable to provide for open spaces or reasonably large gardens. Similarly, owners of open spaces devoted to recreation will be forced—as the reformers say—to develop their land to its full capabilities. Such grounds are often in central situations, and even a moderate supplementary tax will force the occupants out; and the owners to cover the ground with buildings in order to secure the means of paying the tax. The evils of overcrowding would become aggravated in centres and suburbs alike.

Excepting that of the most valuable central streets, we have seen that the holders of the feu-duties and ground rents are the owners of practically all the remaining land values. As they must own by far the greater part of the total land value of any modern town, it follows that the proposed tax would not be a Land Value tax at all unless it included them. The first slice out of the Land Value goes to the holder of the feu-duty or ground rent; the second slice goes, under the name of interest, to the bondholders when the property is burdened; and the remainder to the feuar or owner, lease-holder, or responsible incumbent, whatever his tenure may be. The only point on which the members of the reforming party are in agreement, is that they will tax the third party—the owner perhaps of a mere contingent balance. For the reason just stated they cannot avoid when details are considered, bringing the owner of the first slice in. That being so, how can the owner of the intermediate share hope to escape? If Land Value equals a sixth of Rental Value, and if feu duties are the greater part of land value, to omit them would reduce the new rating value to a still more minute fraction of the old, futile as a basis for taxation.

The ten per cent. supplementary tax, proposed by the "Glasgow Bill," levied on a basis so small as Land Value would have but a trifling yield in the shape of new municipal revenue. It would work mischief, however, out of all proportion to its yield, and far in excess of ten per cent., because of the establishment of the principle of municipal appropriation of the Land Value, and a consequent fear of a future increase of the rate. Supplementary rates rising higher than 10 per cent. would rapidly approximate to the effect of the substitutionary rate for the same reason and long before 100 per cent. was reached bonds would be called up, owners would rush to sell, and in a panic-striken market prices would be such as to produce a wholesale smash in our commercial centres.

Could Only be Effected Here by Land Nationalisation.

Taxation on Land Value may be applicable to a newly settled country. For starting from early prairie values and taxing any subsequent increment the community would grow up with its customs adjusted to conditions which prevented speculation or investment in land. In our own land such a condition could only be reached after a property revolution, when a new generation had adjusted itself to the new order of things. This revolution would surely be produced in the towns by any considerable tax of this nature, and we would be faced by an intermediate stage of financial and industrial collapse. To carry out the reform without incurring this calamity would require a scheme of Land Nationalization or Municipalisation under which liabilities were assumed when assets were appropriated.

The political position of the question is confused enough, but this seems plain—that those who pay rates on high city rentals would pay still more, and those who pay rates on low suburban rentals would pay something less. This aggravation of existing inequalities will hold, whether the tax be substitutionary or supplementary.

Taxation in Proportion to Revenue.

Although an occasional impost such as Death Duties, may be reasonably laid on capital, an annual tax on that basis could only be permanently productive if it did not exceed the amount of the revenue. Land valuation will often place a considerable value on property which yields no considerable revenue, and as payment of the tax will be accepted in currency only, the result must be, for the authority, bad debts; and for the owner, disaster. We have no source from which to pay an annual tax, but revenue, profit, or income, and a rating reform that does not adjust the taxes more accurately to these is an aggravation of present evils and indeed cannot be permanently productive.

While to crush out the landowner may be right or wrong, it is at least a definite political and social policy, but it does not seem to be a sane policy from any point of view to free one class from contribution to the rates altogether which a substitutionary tax, if it could be worked at all, would do.

Land Value Too Fluctuating.

Though profit would be a fairer basis, Rent is a fairly stable payment in hard cash, which the tax-gatherer can lay hold of. Land Value is in comparison a delicate fluid element growing or dwindling with each breath of prosperity or adversity; translatable into cash only in a favourable market, liable to vanish if threatened, and too elusive for fruitful tax-gathering.

A PORTABLE SCAFFOLD—BELGIAN STYLE.

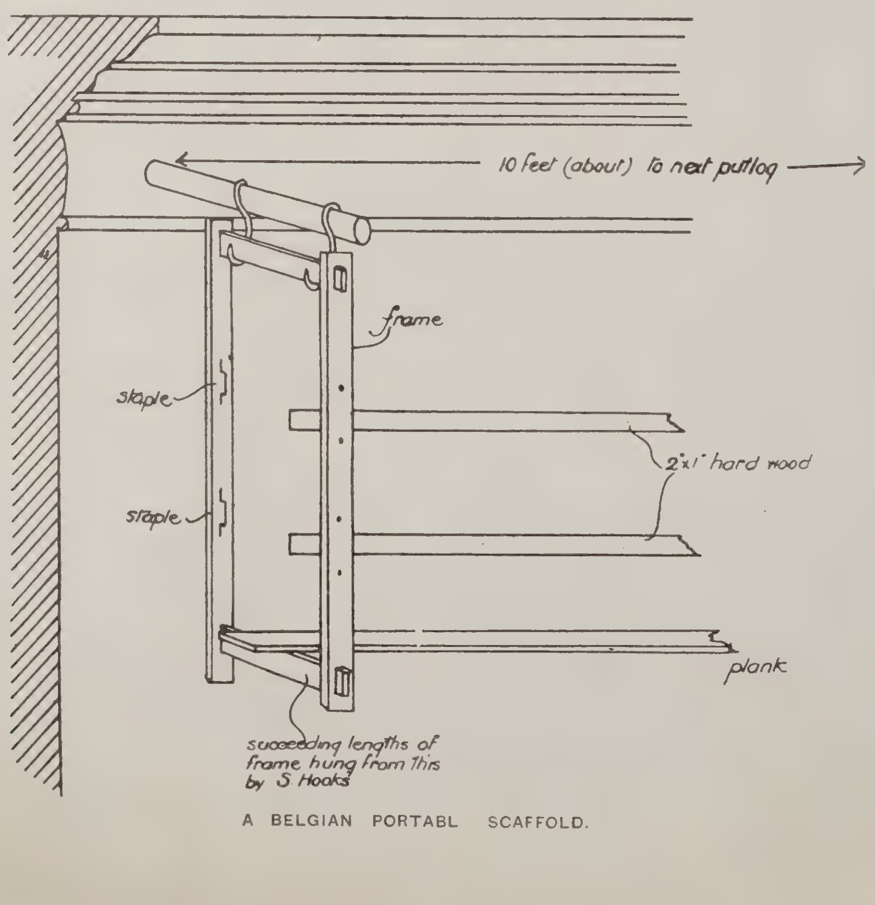
During a recent visit to Brussels the writer saw a type of portable scaffold which appeared to be generally used in painting stuccoed houses. It may be new to some of our readers.

No long ladders are used; probably they are not permitted. Holes are provided in the frieze below the cornice, or, where there is no cornice, about 5ft. below the coping. These holes are situated about 10ft. apart, and are covered when not in use by portable pateras of a more or less ornamental character, according to the design of the house. When painting is to be done, the pateras are removed, and putlogs are inserted and secured in the interior of the roof and left projecting about 4ft. From each of these putlogs is hung a frame about 1ft. 6ins. wide, with sides of about 2½ins. by 1½ins., and having two cross-pieces of similar scantling, one at each end.

The ends of the cross-pieces are rebated to form a tenon, passed through holes cut in the sides and secured by small cotterlike wedges. The frame is hung on the putlog by light iron S-hooks, and secured as well by a lashing to prevent slipping off at the ends. Bolted to the inner sides of the frame are four light iron staples, about 2½ins. by 1½in. inside measure, two on each side. These are for the purpose of receiving light hardwood laths to serve as guard rails, whether a workman is working in a seated or in a upright position. The bottom rail carries an ordinary painter's scaffolding plank and to it hooked by S-hooks a further frame or frames to any required length. The frames are made in several sizes; the smallest (indicated in the accompanying sketch) is about 5ft. to 6ft. long, and the larger sizes are multiples of this up to about 20ft. in length; the cross rails, of course, recurring about every 6ft. to 6ft., and the staples above each rail in similar relative positions. The sketch gives a rough idea of the arrangement.

Supposing a house front is to be painted, the putlogs, at about every 10ft., each carry a hanging frame or frames, sufficiently long to reach down to first-floor level. All the frames, with their planks, guard rails, and safety ropes, to prevent swaying away from the building, are set up before operations begin. Then a man is allotted to every section on a given level, and the whole front is painted down without having to move a ladder or plank or a section. The lowest storey is done from steps or trestles probably.

The whole arrangement is very light and handy, and easily erected or taken down, and apparently quite as safe as ladders. It has probably been long in use, for every house on a lengthy boulevard appeared to be provided with the necessary holes for putlogs, which, when covered by the pateras, attracted no attention, the pateras entering readily into the general designs of the building. The only part of the arrangement that did not appear very safe was the top plank resting just under the put-log. This had no extension for guard rails, but it would not be difficult to add something suitable for this purpose.


10 feet (about) to next putlog
frame
staple
staple
2"x1" hard wood
plank
succeeding lengths of frame hung from this by S. Hooks

A BELGIAN PORTABL SCAFFOLD.

EMPLOYERS' INSURANCE.

The financial responsibilities of building contractors are now so numerous and so extremely onerous as to be well-nigh intolerable. The ruinous risks they run with respect to accident claims by workmen and by members of the outside public must necessarily be covered by some effective system of insurance if the contractor is to be freed from a perpetual burden of apprehension and anxiety. The only question that arises is as to the choice of the medium of insurance. A solution of that difficulty is supplied by the Federated Employers' Insurance Association, Ltd., whose head offices are at 8, King Street, Manchester. This association has been founded by builders for the benefit of builders, and its directors are all well-known building contractors of high standing. The capital is £100,000, of which more than £53,000 has been subscribed. The liability of employers for accidents to workmen, and for accidents to the outside public, form, of course, special features of the association's transactions; but it also undertakes insurance against fire, damage to plate glass, and other risks. Moreover, it offers guarantees for the due performance of contracts in cases in which sureties are required. Then, unlike our somewhat lopsided legislative enactments, it does not tacitly and callously assume that the master-builder himself runs no risk of personal injury. On the contrary, it realises that he is vulnerable and mortal, and offers a policy which, applicable to building trades employers only, provides compensation for all accidents and all illnesses. From time to time, speakers at meetings of the various associations affiliated to the National Federation have testified in particular to a most inestimable feature of the transactions of the Federated Employers' Insurance Association—its practice of prompt settlement. We have therefore much pleasure in drawing attention to the special advantages which the association set forth in the advertisement pages of our present issue.

Builders' Notes.

The Crown authorities will shortly have to decide upon designs for the rebuilding of much of the property in and about Regent Street. The Westminster City Council are desirous of widening the entrance to Argyll Place; and widening Foubert's Place but the cost of the land is prohibitive unless the Crown authorities are willing to make a deduction in view of the general improvement.

* * *

Mr. Maclean, M.P., intends to reintroduce the Leasehold Enfranchisement Bill at an early date. The Bill empowers the lessee of a long leasehold to compulsorily acquire the freehold, or, alternatively, requires that the ground rent should be transmitted into rent in perpetuity. All this is to be done on an equitable market price, which is to be settled by arbitration. It is believed that the principle of the Bill will have a most beneficial effect in encouraging development and building.

* * *

The Westminster City Council will, it is expected, be shortly negotiating further with the "Bakerloo" Railway Co. for a new passenger subway from the Trafalgar Square Station to the south side of Charing Cross. The City Council is asking for a lump sum towards the cost of the work, which involves the removal and rebuilding of some existing structures.

* * *

The half-yearly meeting of the Executive of the Scottish Building Trades' Federation was held in the North British Hotel, Perth, on April 23rd. Delegates were present from Aberdeen, Dundee, Inverness, Perth, Kilmarnock, and Edinburgh. Mr. James Leslie, Aberdeen, presided. The secretary, Mr. James Cameron, solicitor, Edinburgh, submitted reports on the state of trade in Coatbridge, Perth, Dundee, Inverness, Paisley, Glasgow, Kilmarnock, Aberdeen, and Edinburgh and Leith, and without exception they showed trade to be in a depressed state, but there are signs of an improvement taking place in some quarters. A proposal was brought forward to adopt a national crest for the Scottish Federation. A sketch was submitted by the secretary, and unanimously approved, and the matter will come up for final confirmation at the general meeting, which falls to be held in Inverness on 3rd September next.

* * *

The annual dinner of the Newcastle and District Clerks of Works and Builders' Foremen's Association was held on the 23rd ult., in the Continental Restaurant, Newcastle. Mr. George Bennison, the chairman, proposed the toast of "The Building Trades of Newcastle and District." He said that last year he had made allusion to the depressed state of the building trade, and expressed the feeling then that it could not be worse. He was sorry to say, however, that it had turned out to be even worse this year. Contracts were very scarce, and prices were so low that contractors could not get a job at a fair price. The prices were lower than they were a year ago, and he regretted to say that he could not see any immediate prospect in the building trade. Nothwithstanding the low prices there were the provisional items and P.C. sums, which were such a bone of contention, and these were matters that should be taken up. They were well worthy of mutual consideration, and it was a great pity they were creeping into contracts so much as they were. Mr. D. Purdie in responding alluded to the Association as a buffer state between the master builder, the architect, and the client, and said that by their lectures and meetings the Association was an educational force. If the master builders and the architects would only recognise this more fully there would be greater support from the master builders and the architects, both at the lectures and the social gatherings.

* * *

The contract for the great railway to be made across the Andes from Arica in Chile to La Paz in Bolivia, attaining an elevation of upwards of 12,000ft., and having a length of a little over 300 miles, has been given to Messrs. Sir John Jackson, Ltd. It is understood that the actual money voted for the scheme is £3,000,000. Sir John Jackson states that the line will undoubtedly be the highest in the world. The first fifty to sixty miles will be across a desert, and the first business will be to provide a complete system of water supply over that distance. The next fifty miles will be through the Andes. The last two hundred miles will be over the high tableland upon which La Paz, the highest city in the world, is built. Beyond this are the higher ranges of the Andes. At present the only means of transit to the coast is by mule trains, in which two mules have to carry fodder and water for every baggage-carrying mule.

* * *

The Auctioneers' Institute has addressed a memorial to the president of the Local Government Board on the subject of the Housing and Town Planning Bill, strongly objecting to the measure, which will, in its present form, operate inequitably, harshly and disastrously upon owners of property and ratepayers. They urge that it tends towards the destruction of representative local government, and towards bureaucratic government, that it is a coercive measure, that it makes no provision for the broadening of the basis of assessment for the purpose of poor and other local rates, notwithstanding that land and buildings are seriously overburdened already with rates and taxes, and if the Bill becomes law local burdens will be greatly increased; that it proposes to make serious alterations in the law relating to landlord and tenant, and the proposed innovations are in many respects inequitable, and contrary to public policy, while no provision is made for the re-housing of the thousands of undesirable tenants who will be displaced by the contemplated municipal improvement schemes. They deal with the various clauses, and submit that many require drastic alteration, and that some should be deleted.

* * *

At a meeting of wholesale and builders' ironmongers in the N.W., W., and N.E. districts of London, held on April 23rd, it was decided to cease price cutting in respect of a number of articles. It was agreed to draw up a tentative price list of certain goods for a six months' trial from June 1st next. We learn, from "The Ironmonger" that this list contains the following specific articles:—Rainwater goods, soil pipes and underground drainpipes, galvanised furnace pans, manhole covers, cut nails, cast cased portable coppers, galvanised iron cisterns and tanks, hot-water tanks, japanned roll-edge baths, porcelain baths (ordinary builders' qualities), water-waste preventers, builders' closets, and New River plumbers' brassfoundry. S.A.C. ranges were also included, and ordinary portable ranges up to 36in., but we understand that the proposal to include Larbert's ranges is left on the "optional" list. The suggestion that the list might be augmented by the inclusion of such articles as lead and pipes, sinks, felt, corrugated iron, and zinc was not adopted, as it was thought that, if the scheme was reasonably successful, it would better to include additional articles in the list which would be due on January next. It is proposed that the new prices shall be incorporated in the net pocket lists issued by the interested firms, and that the prices shall rule in all ordinary transactions, such as sales over the counter, small orders by post, and so on; but that they shall not be binding for large quantities, or where competition is encountered from outside the area. One of the builders' merchants present agreed to act as hon. secretary for the time being, and, if the state of business should render such a step necessary, another meeting will be called before the time comes to consider the December list.

Proposed New Buildings.

In London.

Following is a selection from the list of new works to which the Building Act Committees of the London County Council recommended the consent of the Council at its meeting yesterday:—

Rebuilding of the Trinity Presbyterian Church, abutting upon Buck Street, Kentish Town Road and Union Terrace, St. Pancras, on the application of Messrs. G. Lethbridge and the trustees.

Erection of a building on the northern side of Church Lane, Tooting, on the application of Mr. A. G. Hastilow, on behalf of Mr. R. Cox.

Erection of buildings on the western side of Hertford Road, Hackney, northward of the De Beauvoir Mission Hall, on the application of Messrs. Gordon, Wilson and Co., on behalf of Messrs. Willey and Co.

Erection of buildings on the northern side of Wyatt Park Road, Wandsworth, to abut also upon the western side of Daysbrook Road, on the application of Messrs. J. S. Quilter and Son, on behalf of Messrs. Chapple and Utting.

Erection of buildings on the eastern side of Berner Street, St. George-in-the-East, at less than the prescribed distance from the centre of the roadway of the street, on the application of Mr. H. T. Bromley, on behalf of the executors of the late T. P. Priestley.

Erection of a house on the southern side of Troughton Road, Greenwich, with its flank abutting upon Rathmore Street, and the erection of four houses on the southern side of Troughton Road, eastward of Rathmore Street, with irregular open spaces at the rear, on the application of Messrs. J. Davey and Co., on behalf of Mr. R. G. Abbott.

Erection of a building on the northern side of King's Road, Chelsea, westward of Upper Manor Street, with an irregular open space at the rear, on the application of Mr. R. Blomfield, on behalf of the London and County Banking Company.

Erection of a building upon the site of Nos. 1, 2, 3, and 4, Spur Street, Leicester Square, on the application of Messrs. Treadwell and Martin, on behalf of Messrs. G. E. Wallis and Sons.

Erection of an addition to block D at the premises of Messrs. Garton, Hill and Co., York Place, York Road, Battersea, whereby each division of such block will exceed in extent 250,000 cubic feet, and be used only for the purposes of the manufacture of saccharine and glucose, on the application of Messrs. Garton, Hill and Co.

Erection of a pump-house at the Grove Road generating station, approached out of the north-eastern side of Grove Road, St. Marylebone, on the application of Mr. C. Stanley Peach, on behalf of the Central Electric Supply Company, Limited.

Erection of buildings on the site of Nos. 117, 118, 119, 120, 121, 122, 123, and 123a, Grange Road, Bermondsey, on the application of Messrs. G. Elkington and Son.

Erection of a library building between Nos. 114 and 120, New Cross Road, Deptford, on the application of Mr. J. Sutcliffe, on behalf of the Deptford Metropolitan Borough Council.

Rebuilding of Nos. 482 and 484, Fulham Road, Fulham, on the application of Mr. G. A. Gale.

Erection of a mission hall building on the eastern side of Mitcham Road, Tooting, to abut also upon the northern side of Longmead Road, on the application of Messrs. Gelder and Kitchen, on behalf of the trustees of the Tooting Wesleyan Mission.

Erection of buildings on a site on the eastern side of Herbert Road, Woolwich, to abut also upon the southern side of Plumstead Common Road, on the application of Mr. J. Rush Dixon, on behalf of the Woolwich Metropolitan Borough Council.

Erection of a building on the eastern side of Old Ford Road, Poplar, on the application of Mr. H. Heckford, on behalf of the Poplar Metropolitan Borough Council.

Erection of a one-storey addition to Red House School, Love Lane, Bromley-by-Bow, on the application of Messrs. Holman and Goodrham, on behalf of the Rev. E. Sinker, M.A.

Erection of a building to abut upon Dean's Mews, Cavendish Square, St. Marylebone, on the application of Mr. W. Hearn, on behalf of the Belsize Motors London Agency, Limited.

Certain deviations from plan for the proposed rebuilding of Nos. 185 and 186, Sloan Street, Chelsea, on the application of Mr. J. P. Briggs.

Deviation from the plans approved on December 21, 1908, for the erection of a building upon the site of Nos. 71, 72, and 73, St. James Street, and Nos. 1, 2, 3, 4, 5, and 6, Little St. James Street, Strand, so far as relates to the omission of the staircase between the fourth and fifth floors, and the provision in lieu thereof of a staircase in the north-eastern open space, on the application of Messrs. W. Woodward and Sons.

Erection of a fitting shop at the Poplar Metropolitan Borough Council's electricity works on the northern side of Yeo Street, Poplar, to abut upon the western side of Violet Road, on the application of Messrs. Nicholls and Reynolds, on behalf of the Poplar Metropolitan Borough Council.

Erection at the premises of the National Motor Cab Company, Barlby Road, Kensington, of two blocks of buildings, each to exceed in extent 250,000 cubic feet, and to be used only for the purposes of a garage for motor cabs, on the application of Mr. E. Keynes Purchase, on behalf of the National Motor Cab Company.

Erection at the premises of Lewis and Allenby, Limited, abutting upon Regent Street, Conduit Street, and New Burlington Place, St. George, Hanover Square, of a division next to Regent Street, to exceed in extent 250,000 cubic feet, and to be used in part as shops, showrooms and workrooms, and in part as offices, on the application of Mr. F. T. Verity, on behalf of Lewis and Allenby, Limited.

In the Provinces.

BIRMINGHAM.—A L.G. Board enquiry will be held to-day (Wednesday) at the Council House into an application by the City Council to borrow £4,200 to purchase a site for a police station in Allison Street.

BRIDGWATER.—A L.G. Board inquiry has been held into the application of the Town Council to borrow £8,500 for alterations and additions to the Municipal Buildings.

LLANDRINDOD WELLS.—A L.G. Board inquiry has been held into the application of the U.D. Council for a loan of £10,000 for a pavilion, to be erected in the Recreation Ground. Mr. R. Wellings Thomas, F.R.I.B.A., of Llandrindod Wells has prepared the plans in conjunction with Mr. W. A. Millward, the Council's surveyor.

SCUNTHORPE.—A L.G. Board enquiry has been held respecting a loan of £5,000 to the District Council for building an additional gasholder.

SWANSEA.—A new docks exchange and offices are to be erected at a cost of £15,000, in Cambrian Place.

WHITLEY BAY.—Plans for a new skating rink, having an area of about 250 square yards, were deposited on Monday last. The new rink is to be constructed on the Rockcliffe estate and the architects are Messrs. T. K. White and S. J. Stephenson, of 59, Grey Street, Newcastle-on-Tyne.

Buildings in Progress and Completed.

ABOYNE.—Under the supervision of Fryers and Penman, architects, of Largs, N.B., William Morris and Company (Ruskin House), Ltd., Westminster, have recently filled the Episcopal Church here with stained glass of the Early XV. Century. The east window is richly decorated with Passion subjects, and the remainder of the windows are made of actual old glass collected by the firm from early English and Continental buildings, and have heraldic and scriptural features introduced, acquired at the recent sale of the Brackenridge Collection of Ancient Glass. The church was erected by George Coats, Esq., of Glen Tanar.

DERBY.—The schools in connection with the Institution for the Deaf and Dumb have recently been extended, the architect being Mr. Arthur Eaton, of Derby. The constructional steelwork and fireproof floors were supplied and fixed by Messrs. Homan and Rodgers, Manchester.

BRISTOL.—The tender of Messrs. James Crispin and Sons, engineers, Bristol, of £2,345 for heating and hot water supply apparatus to the new School for the Blind, Southmead, has been accepted, the architects being Messrs. Edmeston and Gabriel, London and Bristol.

SALTBURN-BY-THE-SEA.—The foundation stones of the P.M. church and schools, which occupy a prominent site in the centre of the town, were laid on the 12th ult. The block is designed in late Gothic, freely treated, a bold square tower forming a prominent feature at the corner. The facings are in Huncoat pressed red bricks, and the dressings in grey terra-cotta with dragged face. The joinery is to be executed in pitch-pine; pulpit, choir fronts, etc., in oak. The accommodation provided in the church is for 500 persons all on ground floor. The contract has been let to Mr. J. G. Porteous, of Guisborough, Yorks, and amounts to £4,300, the architects are Messrs. George Baines and Son, 5, Clements Inn, Strand, London, W.C.

Memoranda.

Mr. J. S. Gibson, vice-president R.I.B.A., has taken into partnership Mr. F. P. Skipwith and Mr. W. S. A. Gordon, and their business will be carried on under the name of J. S. Gibson, Skipwith and Gordon, architects, at 5, Old Bond Street, W.

The partnership between Messrs. Lennox, Robertson and E. C. Morgan Willmott, A.R.I.B.A., of 20, Working Street, Cardiff, has been dissolved. Mr. Willmott's new address is 295, Mary Street, Cardiff.

* * *

The name of the architect of the house at Woking illustrated on page 363 of our issue of April 21st, should have been given as Mr. Edward A. Verger, of Woking.

* * *

Messrs. R. Waygood and Co., Ltd., of Falmouth Road, S.E., who are lift makers by royal warrant to his Majesty King Edward VII., intimate that they have been commissioned to supply an electric passenger lift for the President of the Brazils, and have also received the order for a hydraulic passenger lift for the Turkish Houses of Parliament.

* * *

Messrs. Parry, Blake and Parry, of 82, Victoria Street, Westminster, have reason to congratulate themselves on the result of the recent Surveyors' Institution examination, 240, of their pupils being successful, nearly all the candidates prepared by them. Of the seven prizes awarded, six were taken by pupils of this firm, viz., the Institution prize, Special prize, Beadel prize, Penfold gold medal, Crawter prize, and Galsworthy prize.

Trade and Craft.

Messrs. Young and Marten's Expansion.

Messrs. Young and Marten, Ltd., Caledonian Works, Stratford, London, E., have opened extensive new showrooms at the junction of the main roads to Cambridge and Colchester at Stratford, E. A dome, a cantilevered clock, and a representation in mosaic work of the firm's auspicious emblem, the Rising Sun, are outstanding features of the imposing new premises at "Young and Marten's Corner."

Young and Marten's vast showrooms really constitute a permanent building exhibition of comprehensive character, comprising every article that architect can specify or builder buy. Elaborate racking spaces on each side of corridors running at right angles to the long counter ensure the execution of orders. The following departments are now housed in one building: Gas and electric light fittings, bells, cookers, shop-window fittings, and sundries; builders' ironmongery and brasswork; plumbers' and sanitary engineers' goods; colours, varnishes, and decorators' requisites; ranges, chimney-pieces, and mantels; builders' castings of all kinds. In the building immediately opposite can be inspected: paperhangings; window glass and fascias; timber and wood goods; drain pipes, Staffordshire goods, and cement. The value of Messrs. Young and Marten's permanent exhibition of "everything for the builder" is definitely increased by the tasteful manner in which many of the goods are selected and displayed. The baths and lavatories, for instance, are shown in a series of bath-rooms, illustrating various styles of decoration, while the range of closets and appliances, fitted complete with flush-pipes, very materially assist the choice of suitable apparatus.

The paperhanging department is extensive and important. It is housed in newly constructed and well-lighted premises, where "matching" can be accomplished by the natural light that is essential to this delicate process. All the designs shown in the new pattern books are available, and the firm make a special point of very prompt delivery. The firm's extensive railway stores and sidings at Maryland Point will now become the centre for the execution of post orders; the company's London delivery teams are very numerous and extremely well organised; and their motor lorries cover long distances with heavy loads. Many an architect and many a builder has had reason to feel gratefeel for the facilities afforded by these "universal providers" for builders, who assemble and focus, from a wide area, and redistribute over an area that is still wider, extending to the colonies, to India, the West Indies, South America, the Gold Coast, and China, goods of all descriptions that come within the scope of the builders' merchant.

Carron Gas Appliances.

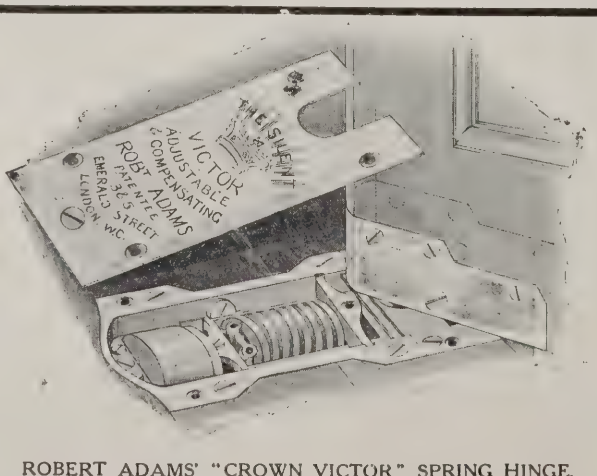
A useful hand-list of gas-heated apparatus for the kitchen has been issued by the Carron Company, whose works are at Carron, Stirlingshire, and who have show-rooms at 15, Upper Thames Street, E.C.; 23, Princes Street, Cavendish Street, W. Cooking and heating apparatus of many types and patterns are shown, and the list affords valuable guidance in the selection of this class of goods.

Congo Roofing and Damp Coursing.

The Barrett Manufacturing Company, Spencer House, Smith Place, London, E.C., have forwarded for notice a list and some samples of their Congo roofing and damp-coursing materials. Congo roofing is made of a strong woollen felt, which is saturated with a special composition that arrests decay and renders the material waterproof and indestructible. It contains no tar, asphalte or rubber, and is unaffected either by water, by the acids of the atmosphere, or by the extremes of temperature. It is manufactured in four thicknesses—half-ply, suitable for sheds and other light structures; one-ply, for farm buildings, for lining walls, ceilings, tunnels, subways, etc., and for other uses in damp-proofing; two-ply, for roofing any class of building, and applicable to chemical works or other buildings subject to acid or alkali fumes, while steam does not injure it; and three-ply, which is good for any class of permanent construction. The material, which is of a uniform pleasant slate-grey colour, and, being elastic and pliable is not affected by vibration, is easy of application, and admirably clear instructions, illustrated by diagrams, are issued by the vendors. The Congo damp-course, which is used extensively for waterproofing foundation walls, is unaffected by gases from the earth, or by contact with lime or cement, and is in no way affected by moisture.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.

PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE.
with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.

60 HIGHEST AWARDS.

The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing.

— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

THE NATIONAL FEDERATION OF BUILDING TRADES EMPLOYERS OF GREAT BRITAIN AND IRELAND.

OFFICERS, ETC., 1909.

President:
ERNEST J. BROWN (LONDON).

Senior Vice-President:
COUNCILLOR S. SMETHURST, J.P. (OLDHAM).

Junior Vice-President:
J. W. WHITE (SUNDERLAND)

Hon. Vice-Presidents:
ROBERT NEILL, J.P. (MANCHESTER).
J. HOWARD COLLS (LONDON).
COUNTY ALDERMAN J. BOWEN, J.P. (BIRMINGHAM).
T. F. RIDER, F.R.G.S. (LONDON).
J. STEVENSON JONES (LIVERPOOL).
ALDERMAN W. HOLDSWORTH, J.P. (BRADFORD).
A. KRAUSS (BRISTOL).
B. I. GREENWOOD (LONDON).
C. W. GREEN (LIVERPOOL).
ALDERMAN W. H. JESSOP, J.P. (HUDDERSFIELD)
WM. SHEPHERD (LONDON).
GEO. MACFARLANE (MANCHESTER).
WM. NICHOLSON (LEEDS).
C. H. BARNSLEY (BIRMINGHAM).

Hon. Treasurer:
JAMES WRIGHT (NOTTINGHAM).

Hon. Auditors:
F. HIGGS (LONDON) AND W. THOMAS (CARDIFF)

Representatives on the Employers' Parliamentary Council:
ERNEST J. BROWN (LONDON).
WM. SHEPHERD (LONDON).

Secretary:
A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

MONTHLY OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

International Building Trades Exhibition.

As announced last month, a visit of about 100 Federation members was made to the above Exhibition, and (as reported in last week's issue of "The Builders' Journal") the party were received by Mr. H. G. Montgomery, M.P., and entertained to tea. Afterwards the president thanked Mr. Montgomery for his invitation, and, the latter having replied, the party proceeded to inspect the very interesting exhibits.

Government Departments and Tendering Without Quantities.

It was reported last month that the War Office had replied to our request that in future, as far as practicable, quantities will be supplied for works of over £500 in value. A reply to the same effect has since been received from H.M. Board of Works, to whom our application was referred by the Postmaster-General.

Comparative Statement of Wages and Hours.

A circular has been sent to the local association, through the Federation, requesting particulars of the current rates of wages and hours for the purpose of the publication of a comparative statement in an early issue of the Journal. Those who have not yet replied are requested to do so immediately.

The Trades Disputes Bill,

which sought to make arbitration compulsory in trade disputes on the application of either party, and to which this Federation offered objections through the Employers' Parliamentary Council, has been dropped.

Housing and Town Planning Bill.

The objections of this Federation to clause 30 of this Bill have been sent to the President of the Local Government Board, and a request preferred that the clause should either be deleted or amended so that where a dwelling is reported as not up to the necessary standard of sanitation or repair and so entered on the quinquennial survey called for by clause 30, it should be open to the owner, on satisfying the surveyors that these defects had been subsequently remedied, to have the fact entered on the public register referred to in sub-section 2 of clause 30. Result is not yet known. Several members, in the debate on the second reading, on April 5th, made objection to the quinquennial survey. The Bill was read a second time, and referred to a Committee of the whole House.

N.A.O.P. Agreement.

A meeting of the joint committee under above agreement was held on April 21st, when various suggestions for the improvement of the agreement were considered, and after a friendly discussion were remitted to a sub-committee to consider and report to a further meeting, to be held probably on May 25th.

Half-yearly Meetings.

In consultation with the Portsmouth Association, the president has fixed Tuesday, July 20th, for the half-yearly Executive Council Meeting, and Wednesday, July 21st, for the general meeting. It is understood that the Mayor of Portsmouth has kindly consented to open our proceedings at the General Meeting and welcome the Federation. He has also granted the free use of the banqueting room at the Town Hall for that day. For the Council Meeting, the Grand Jury Room at the Town Hall has been secured; but, should the banqueting room be free on July 20th, the Mayor has promised to place it at our disposal.

Court of Arbitration.

As the result of correspondence in which it was suggested on behalf of this Federation that it should be represented on the panels to be formed in connection with the above Court, it is stated that "the Board of Trade have endeavoured to obtain the services of well-known and representative employers, and, at present, not those of representatives of particular industries. The Board considers that these representative employers would fully appreciate the interests of the employers' side in any dispute; and in cases in which they are not familiar with the technical details of the industry affected, they have power to appoint technical advisers to advise them. Should, however, the parties to a dispute request the Board to appoint a Court including employers and workpeople from their own industry the Board would give the request their most favourable consideration."

Apprenticeship Form.

The South Wales Federation report having adopted a form of apprenticeship for the use of members. Copies can be had by any part of the Federation at the same price as its own local associations are supplied.

Meetings of the Journal Committee and Administrative Committee were held on April 20th.

The Secretary was appointed to attend a meeting of the International Congress Committee at Brussels on April 26th, and did so. The rules for the proposed International Federation were considered and roughdrafted. They will shortly be submitted to the various Federations for consideration. The secretary also attended the celebration of the twenty-fifth year of the Belgian Builders' and Public Works Contractors' League, which took place on April 24th and 25th. The Journal Committee was re-elected, except that the name of Mr. W. R. Thompson, president of the Yorkshire Federation, was substituted for that of Mr. Nicholson.

Reports from the branches as to the working of the form of contract were considered, and remitted to a sub-committee for further consideration and report, as also a draft Fair Wages Clause. It was decided to again issue the forms calling for a return of membership and men and apprentices employed.

Trade Boards Bill.

Mr. Churchill has consented to receive a deputation from the Employers' Parliamentary Council to urge the objections entertained to certain clauses of the Bill, especially as to the power of extension to other trades than those scheduled in the present Bill.

A. G. WHITE, Secretary.

THE NORTHERN CENTRE OF THE NATIONAL FEDERATION.

COMPOSED OF

The Lancashire, Cheshire and North Wales Federation, The Yorkshire Federation and The Northern Counties Federation.

Secretary: JAMES DENVER, Cromwell Buildings, Blackfriars Street, Manchester

The quarterly meeting of the Northern Centre of the National Federation was held at the boardroom of the National Federation, Bedford Street, London, on Wednesday, April 21st, at 10.30 a.m., when the president (Councillor Stephen Easten, Newcastle-on-Tyne) presided over an attendance of sixteen representatives from the various districts (whose names are recorded in the attendance book) and the secretary.

The minutes of the annual meeting held in London in January were read and confirmed.

Arising out of the minutes, the Yorkshire representatives reported on the case of the York member.

A letter was read from the National Federation *re* the N.A.O.P. agreement, and the action of the secretary thereon confirmed.

It was resolved that the official stationery of the centre should, when reprinted, bear some reference to "The Builders' Journal" as being the sole organ of the Federation.

Some discussion took place on the proposals for amending the National form of contract; but as the National Federation had appointed a committee to fully consider the same, it was resolved to leave the matter in their hands.

Nominations of representatives from the three Federations on the Centre Conciliation Board were reported by the Secretary, and formally confirmed.

This concluded the business.

Northern Centre Conciliation Board.

The annual meeting of the Northern Centre Conciliation Board has been definitely fixed to be held in Leeds on Tuesday, May 18th, at 2.30 p.m. Associations having any matters to bring before the Board should forward the same on to the Employers' Secretary as early as possible for consideration at this meeting.—JAMES DENVER, Employers' Secretary.

THE LANCASHIRE, CHESHIRE AND NORTH WALES FEDERATION.

Secretary: JOHN TOMLISON, Cromwell Buildings, Blackfriars Street, Manchester.

The monthly meeting of the Administrative Committee of the Lancashire, Cheshire, and North Wales Federation was held at the boardroom, Manchester, on Friday, April 16th, when the President (Mr. William Bullen) presided over an attendance of eleven representatives.

The minutes of the last meeting were read and confirmed and reported upon.

Messrs. William Livesey and Sons, joiners and builders, of Blackburn, were elected to individual membership of the Federation.

In accordance with a resolution of the Executive Board, the committee then proceeded to consider the proposals for amending the rule providing for the election of the Administrative Committee, and after some considerable discussion a draft rule was adopted, for which it was decided to give notice to the local associations.

Proposals for amending the National form of contract from various local associations were then considered, and after debate on the various points raised, it was agreed to forward the same on to the National Federation.

Correspondence was reported between the National Secretary and the War Office and H.M. Office of Works, in which the two departments had agreed to supply quantities for all jobs over a cost of £500 in future "where practicable," and it was agreed to accept the concession.

A very lengthy discussion took place regarding the present state of trade and unremunerative prices, but no formal resolution was passed thereon.

Some correspondence was read which had taken place between the National Secretary and the Rochdale Association regarding the attitude of the latter association to the Conciliation Boards, and the Secretary was instructed how to deal with the same.

A meeting of the Insurance Committee was held on Friday, April 30th, for the purpose of considering the amended proposals of the Federated Employers' Company, but their report is not yet to hand.

The Administrative Committee also met on Monday, April 3rd, to receive counsel's report in the case of a Bolton member, but their report is not yet to hand.

LOCAL ASSOCIATIONS AFFILIATED TO THE LANCASHIRE, CHESHIRE AND NORTH WALES FEDERATION.

ACCRINGTON AND DISTRICT.

Secretary: James Whittaker.

This association having been organised and constituted, Mr. James Whittaker, of Inglewood, Whalley Road, Accrington, has been appointed secretary.

ASHTON-UNDER-LYNE, STALYBRIDGE, AND DISTRICT ASSOCIATION.

Secretary: G. H. Tonge, A.S.A.A.

The annual meeting and dinner of the Ashton, Stalybridge and District Association was held at the Pitt and Nelson Hotel, Ashton-under-Lyne on March 31st. The chair was occupied by Mr. E. Marshall, vice-president, and there was a good attendance of members.

A report of the year's work was read by the secretary, Mr. G. H. Tonge, which was unanimously approved. Amongst the matters referred to in the report were the question of admitting labourers on conciliation boards, and reconsideration of joiners' working rules. Mention was also made of an arrangement which had been made for the admission of plumbers as members of the Association, or the nomination of their own representative. A report was presented of negotiations which had taken place with a view to securing a preference for *bona-fide* builders in the matter of prices for bricks. The meeting approved the action of the executive, and a resolution was passed requesting the committee to continue the negotiations until satisfactory arrangements had been entered into.

The treasurer's report was presented by Mr. Z. Pike and adopted. Arising out of the report, a discussion took place on the question of a contribution to the Federation Reserve Fund, and the matter was referred to the Executive Committee. The officers for the year were elected as follows:—President, Mr. Jas. Storrs; vice-president, Mr. E. Marshall; treasurer, Mr. Z. Pike; who, with the following, form the Executive Committee:—Messrs. J. Saxon, A. Jeffreys, T. Dean, E. Kirkby, J. Shuttleworth, E. Gibson, and G. H. Cook. The members, together with a

ROBERT HALL,
Building Surveyor,
52, Frederick Street, BURY.

With over 35 years practical experience of the Building Trade, and during the last 15 years a very varied experience in measuring up and adjusting contract and other accounts, is prepared to undertake and submit quotations for the following:—

The Measuring-up and Adjustment of Accounts,
Collection and Settlement of Accounts,
Assistance given in Estimating,
Annual or other Periodical Stocktakings,
Private Enquiries and Arbitrations undertaken,
or any other special work incidental to that of a Builder or Contractor.

52, Frederick St., BURY.

NATURAL ROCK ASPHALTE
(Compressed or Mastic)
For Horizontal and Vertical Damp Coursing
For Flat Roofs, Basements and other floors.

The French Asphalte Co., Ltd.
(ESTABLISHED 1871)
Supply only the best material from their own mine of St. Jean de Maruejols, combined with the best workmanship.
Complete satisfaction given to the leading Architects.

Apply for Prices:—
5. Laurence Pountney Hill, Cannon Street, E.C.

D. LORDEN,
Plasterer,
Plaster and Cement Merchant,
Worker in Fibrous Plaster &c,
Tom Brown Street, RUGBY

For Architects, Builders and Engineers.
TRUE TO SCALE.
BLACK LINE PRINTS.
Permanent. *Done on any Paper or Cloth.*
R's Method of Perspective.
WRITE FOR PARTICULARS.
W. F. STANLEY & CO., LTD.,
13, Railway Approach, London Bridge.
Tel. 871 Hop. Telegrams: "TRIBRACH, LONDON."

T. N.: 14410 Central. T.A.: "Coatostone, London."
Coatostone.
LIQUID STONE
NEAL'S PATENT.
Applied as Paint for Coating
Plaster, Cement, Stone or Woodwork
to produce a natural Stone effect
FOR INTERIOR OR EXTERIOR WORK
THE COATOSTONE DECORATION CO.
77, Mortimer Street, Regent Street, W.

"The Practical Exemplar of Architecture."
A Portfolio of Choice Details ready for immediate use and adaptation.
Selected and Edited by
MERVYN E. MACARTNEY,
B.A., F.R.I.B.A., F.S.A.
120 Plates. Price 12/6 nett, including Portfolio.
Send for Illustrated Pamphlet.
Technical Journals, Ltd., Caxton House, Westminster.

number of invited guests, afterwards partook of dinner.

After dinner the usual toasts were honoured.

MANCHESTER, SALFORD, AND DISTRICT ASSOCIATION.

Secretary: J. Tomlison.

The plasterers' and painters' branch of the Manchester, Salford, and District Association held their monthly meeting on Tuesday, March 9th, when Mr. James Higson presided over a good attendance of members. Matters of trade interest were considered, and several resolutions passed thereon.

The monthly meeting of the general committee of the association was held at the boardroom, Blackfriars Street, on Thursday, March 11th, when the president (Mr. George Macfarlane) presided over a well-attended meeting.

Correspondence was read from the National and Lancashire and Cheshire Federations regarding the International Building Trades Exhibition, and the National form of contract, and resolutions were passed thereon.

It was decided to issue again the telephone card to members of the association, and the secretary was instructed to proceed therewith.

The Joiners' Branch met on March 11th for the purpose of considering a communication from the operatives regarding the proposals for alterations to the working rules. It was recommended that the amended overtime, grinding, and discharge rules should come into operation as from May 1st next.

A deputation attended from the Wood-cutting Machinists' Society for a definition of a clause contained in their rules with this association regarding "flat cutting," which was duly given.

Two meetings have been held of the manufacturers of patent plaster partitions, members of the association, regarding the fixing and finishing of their plates, and a resolution has been sent on to the Plasterers' Branch on this subject.

A meeting of the Joint Committee of Joiners, Masons, and Plasterers met on April 1st to receive a report and to discuss one or two points arising out of the notices given to the operatives of each trade for alteration to their working rules.

The Stonemasons' Branch of this association have met on two or three occasions for the purpose of meeting representatives from the Operatives' Society to discuss the proposals for amending the present working rules, but without any decision being arrived at, and the matter will go before the Conciliation Board according to rule.

The monthly meeting of the General Committee was held at the Boardroom on Thursday, April 15th.

A resolution was passed instructing the secretary to write to the secretaries of the National Federation and the Operative Plasterers' National secretary, regarding the N.A.O.P. agreement.

A special general meeting of the association was held the same afternoon for the purpose of electing the employers' representatives on the local Conciliation Board.

Election of the Bricklayers' representatives was postponed, but representatives for the Joiners and Stonemasons were duly elected.

A vote of condolence and sympathy was passed with the wife and family of the late Mr. J. B. Kendall.

The Plasterers' and Painters' Branch held their usual monthly meeting at the Boardroom, on Tuesday afternoon, April 20th, when Mr. James Higson presided over a good attendance of members.

Some discussion took place with reference to the notice given the Operative Plasterers for alterations to the present working rules, and it was ultimately left in the hands of the chairman and secretary to call a special meeting if necessary.

A letter was read from the manufacturers of patent plaster partitions forwarding a resolution with reference to master plasterers being allowed to fix their slabs, and it was resolved that a further joint meeting be held between the branch Committee and the manufacturers on the subject.

A meeting of the Joiners' Committee was held on Monday, April 26th, when a deputation from the Operatives' Society attended to discuss the notice and counter-notice for alterations to rules.

It was ultimately agreed to withdraw the proposals for amending Rule 1; the employers desiring an extension of the winter months, and the operatives desiring similar hours to those at present in force in Liverpool, also an advance in wages of ½d. per hour.

The operatives agreed to submit the proposals of the employers regarding the boundary again to their members, the employers desiring that the radius be two miles from Albert Square, whereas the present radius is taken from the Royal Exchange and various points named.

A very lengthy discussion took place on the subject of walking time or travelling expenses, the operatives claiming that the amounts offered by the employers would not cover their actual out-of-pocket expenses, and suggesting that the amounts be doubled. Ultimately the employers agreed to amend their rates as follows:—From 2 to 3 miles out, 3d. per day; from 3 to 4 miles out, 4d. per day; from 4 to 5 miles out, 5d. per day.

The operatives, after retiring for private consultation, agreed to accept the amended terms, subject to the confirmation of their committees.

It was mutually agreed to accept the old rule with reference to country work.

Some considerable discussion took place on the proposals of the employers for defining the district within which the rules shall apply, which they desired should be a radius of five miles from Albert Square, except where this overlaps some other federated district, when it shall be a matter for mutual arrangement. The operatives submitted a map marked out with their suggested radius, which included some 13 to 15 miles on the Altrincham side; it was agreed that it was a matter that would have to be arranged with the various districts, and it was decided to leave the same in the hands of the president and secretary from both sides.

It was agreed that the revised rules come into operation as from May 1st [instant].

LLANDUDNO AND DISTRICT ASSOCIATION.

Secretary: E. P. Morris.

Several meetings of the Llandudno and District Association have been held in connection with the contract for the new Carnegie Free Library. Plans were prepared, quantities issued, and tenders invited. When the tenders were received it was found that they exceeded the amount the District Council were authorised to spend on the building, with the result that the lowest tenderers were asked to send in amended prices, together with the original bill of quantities priced so that the new tenders could be verified. In view of the official statement that the quantities would not form part of the contract, it was felt that this request was not fair, and that fresh quantities should be issued. This request was acceded to, and the successful contractor was Mr. Edward Owen. Efforts were made to obtain the quantities as part of the contract, but without success; and the condition was accepted under protest, on condition that the R.I.B.A. contract form should be used.

A small sub-committee is considering the question of universal starting time.

The Association intend inviting the local architects to a conference on the question of quantities.

RADCLIFFE, WHITEFIELD, PRESTWICH AND DISTRICT ASSOCIATION.

Secretary: W. Lomax.

A lecture by Mr. H. Burke, on "Reinforced Concrete Construction," was, by invitation of the committee of the Radcliffe and District Association, delivered in the lecture hall of the Public Library, Radcliffe, on March 29th, and was attended by a good number of members and persons interested in the building trade.

Mr. Burke said that while the reinforced concrete system of construction was comparatively new in this country, a vast amount of such work had been and was being done in France, Italy, Germany, Austria, and America; and he had recently read that, in linking New York to Havana, it was found necessary to bridge a tidal way of eleven miles, which was being spanned with 186 arches in reinforced concrete. In our own country, prohibitive by-laws had retarded the extension of the system. The Great Wall of China, and the Roman Pantheon, were cited as early essays towards concrete construction, and in the former case reeds were used as a sort of reinforcement. Modern developments seem to have sprung from the idea, successfully carried into practice by a French gardener, M. Monier, of strengthening tree-pots by embedding wire netting in the clay of which they were made. The principle of reinforcement, the lecturer reminded his hearers, is that the embedded metal takes the tensile and transverse strains; and the aim is to make the metal and the concrete "work together simultaneously and harmoniously." Both theory and practice were illustrated in a series of diagrams and photographic views, comprising in all about fifty slides. Many practical hints on the details of construction were given, and the lecture was followed throughout with close attention.

WIGAN AND DISTRICT ASSOCIATION.

Secretary: R. Hollows, A.C.A., etc.

In connection with the notice and counter-notice of alterations to joiners' working rules, in which the Wigan Association is interested, further meetings have been held since the last report appeared, and amendments and additions to the old working rules have been agreed upon as set out hereunder. The operatives agreed that the following addition to the starting time rule should be made: "Any employer having a shop beyond five miles radius from the Wigan Market Place and taking a job in Wigan and district shall comply with the rules of the Wigan employers. Should any employer require his men to travel by train or tramcar to a job within a three-and-a-half mile radius, the workman on payment of the return fare by the employer shall travel by the car or train leaving the terminus or station at the first time immediately preceding the starting time of work. With respect to the railway train or car, this clause to apply only to those starting within twenty minutes preceding the starting time. With respect to meal hours and starting times for country jobs, a joint agreement between the employers and employees' societies may be made to fall in with the running of the trains."

An addition to the "country jobs" rule, bringing the joiners on a par with the bricklayers, was agreed to as follows: "And should a Wigan employer have a job exceeding three-and-a-half miles from the Wigan Market Place, he shall be at liberty to start men on the job."

It was further agreed that a new rule be made as follows: "No workman shall work for anyone other than a bona-fide employer who has a joiners' shop which is rateable, provided always that this does not apply to a legitimate member of the building trade who provides the material in addition to the labour. No workman to be allowed to systematically do work at night for any outside party."

The piecework and prepared woodwork rule was allowed to remain as at present, and a limitation of apprentices agreed to of one apprentice to two workmen employed on an average of the two preceding years, as a concession for the above new rule.

The rules were signed at a meeting held on Thursday, March 25.

THE YORKSHIRE FEDERATION.

Secretary: J. DAVIDSON, 14, Park Road, Leeds.

LOCAL ASSOCIATIONS AFFILIATED TO THE YORKSHIRE FEDERATION.

BRADFORD ASSOCIATION.

Secretary: J. Davidson.

The monthly meeting of the Bradford Association was held on April 27th. A letter was read from the president stating that he was now recovered from his recent illness, and hoped at an early date to be able again to take an active part in the work of the association. The treasurer presented his monthly report, and urged upon the members the desirability of paying their subscriptions at an early date. The minutes of the Yorkshire Federation were read and approved, and satisfaction was expressed at the successful issue of the case which was recently pending against a York contractor.

It was decided to hold the annual meeting of the Bradford Local Conciliation Board on Tuesday, May 11th, at 7.45 p.m.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

The monthly meeting was held on April 19th, and owing to the unavoidable absence of the president, the vice-president (Mr. O. Mawson) occupied the chair.

A further letter was read from the Leeds and Yorkshire Architectural Society with respect to the preparation of plans by builders.

A committee was appointed to go through the times for winter working hours, submit an amended arrangement to the representatives of the operatives' societies, and ascertain whether they are willing to enter into a mutual arrangement for revision, with a view to the same taking effect next winter.

The date for the annual meeting of the Leeds Conciliation Board was left in the hands of the president and secretary.

Messrs. Mawson and Tomlinson reported that they had, with other members, on the invitation of the Leeds Education Committee, inspected the work carried out at the evening classes in connection with the Technical School. The members were of opinion that every reasonable facility should be granted by employers to apprentices in order that they might have an opportunity of attending the classes, and in this way increase the general standard of efficiency of the skilled artisans in connection with the building trade.

It was resolved to obtain a sufficient number of copies of the Yorkshire Federation Directory to enable one to be supplied to each member.

A discussion took place on the recent acceptance of tenders for school repairs by the Leeds Education Committee.

YORK ASSOCIATION.

Secretary: J. Hague, Solicitor.

An executive meeting of the York Association was held at headquarters on March 2, when several important questions were discussed, and deputations were received from the Operative Joiners and the York Pageant Committee. The latter deputation consisted of Mr. Geo. Wilson and Mr. E. R. Tate, who produced plans and specifications, and enlisted the co-operation of the association in the construction of the various properties required. The whole of the members present expressed their cordial sympathy with the undertaking, and at once undertook to be responsible for the construction of the various thrones, pedestals, and altars required. Mr. George Wilson thanked the members present for their ready and unanimous help, and the deputation withdrew.

The general quarterly meeting was held on March 11th, at headquarters, the Lord Mayor presiding over a good attendance. After the minutes had been read and confirmed, the secretary gave a report on the finances of the annual dinner, and on the new calendar list of members, which was approved.

It was unanimously resolved to forward £20 to the subscription account of the Yorkshire Federation.

The questions of the National form of contract, declaration as to health, and admission of labourers to conciliation board, were duly considered, and in each case the executive's recommendations were approved.

The summer excursion was left over to the executive committee for consideration and report.

The chairman appealed to the members generally to assist in the making of necessary properties for the forthcoming pageant, and to do all they could to promote its success. The secretary was asked to furnish the Pageant Committee with a list of the association members.

THE NORTHERN COUNTIES FEDERATION.

Secretary: W. H. HOPE, Solicitor, Post Office Chambers, 14, Norfolk Street, Sunderland.

LOCAL ASSOCIATIONS AFFILIATED TO THE NORTHERN COUNTIES FEDERATION.

MIDDLESBROUGH ASSOCIATION.

Secretary: Walter Rigby.

The monthly meeting of the Middlesbrough and District Association was held in the Grand Hotel, Middlesbrough, on Wednesday, April 7th, at 7.30 p.m.

The president (Mr. W. Masters) presided over a good attendance of members.

The secretary reported that the negative resolution *re* proposed new agreement for use between full contractors and sub-contractors, also the affirmative resolution in reference to desirability of a uniform time for starting work for the different trades connected with building operations, had been forwarded to the Tees-side Federation as requested.

It was reported that the National Association had sold out the supply of apprenticeship indenture forms, and did not intend printing more, as it was thought that the local associations or federations should draw up their own forms to meet local conditions. After some discussion, it was decided to advise Tees-side Federation as follows:—"This Association suggests that this matter be taken up by the Tees-side Association, and that an indenture form be issued by them to the local associations. It is also suggested that the Tees-side form be modelled upon the one now in use issued by the National."

By resolution, the quarterly meeting of the Northern Counties Board of Representatives was fixed for Middlesbrough. It had been decided to hold the meeting on April 15th, at 3 o'clock, at the Grand Hotel.

It was unanimously decided that this association invite the Board to tea after the meeting.

Re the request of the National secretary as to return of comparative statement of hours and wages, it was decided to forward information as required.

The question of a summer outing was brought up, and very favourably received. A suggestion that this might be extended from an association to a federation outing met unanimous support, and the secretary was instructed to forward a resolution to Tees-side Association bringing the matter forward for their consideration.

The following new members were accepted:—Messrs. La Brea Asphalte Co., Newcastle; T. Hunt, Brickworks, Linthorpe.

TYNE AND BLYTH DISTRICT BUILDING TRADES FEDERATION.

W. H. HOPE, Solicitor, Post Office Chambers, 14, Norfolk Street, Sunderland.

TYNE AND BLYTH FEDERATION.

Secretary: W. H. Hope.

At the annual general meeting of the Tyne and Blyth District Federation, which was held at the Hotel Metropole, Newcastle-on-Tyne, on March 30th, Mr. W. T. Weir (Newcastle-on-Tyne) in the chair, there were present representatives from Newcastle-on-Tyne, North Shields, South Shields, and Blyth.

The honorary auditor submitted the audited balance sheet, which had been considered by the Executive Council, who recommended its adoption. On the proposition of Mr. J. T. Armstrong, seconded by Mr. J. C. Hope, the balance sheet was adopted, and Mr. Mabley thanked for his services.

The wage returns received from the local associations, along with the estimated expenditure for the ensuing year, together with the recommendation from the Executive Council, were considered, and, on the proposition of Mr. J. C. Hope, seconded by Mr. J. Pelton, it was resolved:—"That the subscription from the local associations to the Federation for the current year be the same as last year, viz., at the rate of 2s. per £100 wages paid."

The secretary presented his annual report, which dealt with the work of the Federation (and included a report from Mr. Creasor on the work of organisation) for the past year. On the proposition of Mr. W. T. Weir, seconded by Mr. W. Foster, Mr. Hope was thanked, and his report adopted.

Arising out of the report of the work of organisation, on the proposition of Mr. R. Heslop, seconded by Mr. A. Ross, it was unanimously resolved:—"That this meeting recommend to the Executive Council that consideration be given to the remuneration of the organising secretary."

The Executive Council reported that they had elected the following officers for the ensuing year:—As chairman, Mr. W. T. Weir, Howdon-on-Tyne; vice-chairman, Councillor J. T. Armstrong, South Shields; honorary auditor, Mr. W. Mabley, South Shields. The report was received.

The recommendation passed by the Executive Council with respect to the organisation of North Shields Association was placed before the meeting, and, on the proposition of Mr. J. Pelton, seconded by Mr. W. Foster, it was unanimously adopted.

The question of amendment to the National form of contract was considered, and after much discussion it was resolved to recommend to the Northern Counties Federation:—"That Clause 27 as interpreted at present is causing a serious injustice to builders, by depriving them of a proper trade discount, which was never the intention of the parties to the agreement. This clause requires amendment so as to allow a trade discount, and to allow a profit on all goods handled and fixed by the contractor."

A meeting of the Executive Council of the Tyne and Blyth District Federation was held at the Hotel Metropole, Newcastle-on-Tyne, on March 30th, Mr. W. T. Weir (Newcastle-on-Tyne) in the chair, when representatives were present from Newcastle-on-Tyne, South Shields, and Blyth; North Shields being unrepresented.

The minutes of the Council meeting held at Newcastle-on-Tyne on March 16th, which had been printed and circulated among the members, were taken as read.

On the proposition of Mr. W. Foster, seconded by Mr. J. T. Armstrong, Mr. W. T. Weir was unanimously elected chairman. Mr. Weir thanked the members for his election, and said he had pleasure in accepting the honour, and moved a vote of thanks to the retiring chairman, Councillor Stephen Easten, who was unavoidably absent from the meeting. This was given accordingly.

On the proposition of Mr. R. Heslop, seconded by Mr. J. C. Hope, Mr. J. T. Armstrong (South Shields) was unanimously elected vice-chairman. Mr. Armstrong suitably returned thanks for his election.

On the proposition of Mr. J. T. Armstrong, seconded by Mr. J. C. Hope, Mr. William Mabley (South Shields) was unanimously re-elected honorary auditor.

The honorary auditor submitted the audited balance sheet for the past year, and proposed that a recommendation for its adoption be placed before the annual meeting. This was seconded by Mr. R. Heslop and agreed to.

The question of the annual subscription was discussed, along with the wage returns and estimated expenditure for the current year; and on the proposition of Mr. R. Heslop, seconded by Councillor J. T. Armstrong, it was decided to recommend to the annual meeting:—"That the subscription for the current year be the same as last year, viz., at the rate of 2s. per £100 of wages paid to cover the subscription of the local associations to the Northern Counties Federation of Building Trade Employers and the Tyne and Blyth District Federation needs."

The question of organisation was discussed, and it was decided to advise the annual general meeting to recommend to the North Shields Association:—"That the North Shields Association be recommended to appoint two of their members, along with Councillor J. T. Armstrong (South Shields) and the organising secretary, to interview the non-members within the area governed by their Association, explaining the objects of the association and inviting them to join."

THE MIDLAND CENTRE OF THE NATIONAL FEDERATION.

Secretary: F. W. Amphlet, 58, New Street, Birmingham.

LOCAL ASSOCIATIONS AFFILIATED TO THE MIDLAND CENTRE,

BIRMINGHAM ASSOCIATION.

Secretary: E. J. Bigwood, J.P.

A meeting of the Local Conciliation Board was held at the Imperial Hotel, Temple Street, Birmingham, March 26th, Mr. C. H. Barnsley presiding.

Mr. F. G. Whittall (president, Birmingham Building Trades Employers' Association) explained what had taken place at the Conciliation meetings with the various branches of the trades. He pointed out that the points to be decided were:—The ordinary hours of work; the time of commencing overtime; and the desirability of introducing a night-shift rule. With reference to the last item, Mr. Whittall said that the Birmingham Building Trades Employers' Association were quite ready to have a night-shift rule, but that it must be with all trades or not at all.

Mr. Grove (the Bricklayers' Society) explained that a vote was being taken from their members on the employers' proposals, and that as the result of the ballot would not be known till March 29th, he was not in a position to vote.

Mr. Saunders said that the carpenters would agree to the 8 o'clock starting time in the winter months, and overtime after 5 in the summer and 4.30 p.m. in the winter, if the other allied trades agreed.

Mr. Dye (of the Masons' Society) said that if the employers would have a worked-stone rule, the operatives would agree to the 8 a.m. starting time during the winter months.

It was decided that the meeting should be adjourned till March 30th, at 3 p.m.

The adjourned meeting was held at the Imperial Hotel, Temple Street, at the time above mentioned, Mr. C. H. Barnsley again presiding.

The minutes of the meeting held on March 26th having been read, confirmed, and signed, Mr. W. Grove (of the Bricklayers' Society), reported that their members could not agree to the employers' proposals, the voting being 136 for and 440 against.

It was resolved that Rule 2 (Hours of Work) should read as follows:—The ordinary hours of work shall be from 6.30 a.m. to 5 p.m. on each of the first five working days of the week, with one and a half hours per day allowed for meals, but during the winter months the hours of work shall be as under:—October 24th to November 24th inclusive, 7 a.m. to 5 p.m. (with one hour for meals); November 21st to January 29th inclusive, 8 a.m. to 4.30 p.m. (the men to have had breakfast before commencing work, and to have half an hour for dinner); January 30th to February 26th, inclusive, 7 a.m. to 5 p.m. (with one hour for meals).

It was also resolved that Rule 4 (Overtime) shall read as follows:—All overtime made at the request of the employer, after the termination of the ordinary working hours, up to the recommencement of ordinary working hours on the first five working days of the week, and after one o'clock on Saturday up to 12 midnight, also all Bank Holidays, except Good Friday, shall be paid for at the rate of time and a half; but from 12 midnight on Saturday, during Sunday, and Christmas Day, it shall be paid for as double time. Overtime shall not be paid until a full ordinary day has been worked, except in cases over which the workman has no control, or time lost owing to inclement weather.

It was proposed by the Stonemasons that all stonework and patent stones be fixed by masons, except in the case of girder pads or a single head or sill. The above proposition was put to the meeting and defeated.

The employers withdrew their notice of a reduction of masons' fixers' wages.

It was also proposed by the Stonemasons:—"That piecework be not allowed, and no worked stone, or part worked stone, to come into the district from a lower-paid district." The voting on the above matter being equal, under the rules it was referred to the Midland Centre Conciliation Board.

It was proposed and resolved that, pending the settlement of matters now under consideration, the old rules shall apply till May 1st.

The meeting closed with a vote of thanks to Mr. C. H. Barnsley for presiding.

COVENTRY AND DISTRICT ASSOCIATION.

Secretary: W. Ivens.

Members of the Coventry and District Master Builders' Association, to the number of 28, on Wednesday, April 28th, paid a visit to the Building Exhibition at Olympia. The party included the president (Mr. C. Garlick) and the secretary (Mr. Wm. Ivens), and it was generally agreed that the exhibition was the finest of its kind yet seen. A model of a refuse destructor similar to the one proposed to be erected in Coventry, naturally attracted the special attention of the visitors, who, however, were delighted with the Exhibition as a whole.

LEICESTER ASSOCIATION.

Secretary: S. A. Dove.

The monthly meeting of the Council was held on April 28th, at the Saracen's Head Hotel, Leicester, Mr. Yates (president) presiding. Two new members were admitted, bringing the total membership to 137. Mr. Yates reported the meetings held with the Bricklayers', Carpenters' and Bricklayers' Operatives' Committees with reference to alteration of working hours, and he was pleased to say that after some lengthy meetings, also a meeting of the Local Conciliation Board, a settlement had been arrived at with the bricklayers and carpenters. With respect to the labourers' society, a meeting was to be held on May 4th to endeavour to

ROOFING SLATES.
Velinheli, Penrhyn and Westmoreland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

THE ASTON JUNCTION CO.
LTD.,
Aston Road, BIRMINGHAM,
BUILDERS' MERCHANTS
AND
SLATING CONTRACTORS.
CEMENTS, PLASTER, LATHS, LIME, QUARRIES, TILES, CHIMNEY POTS, SANITARY GOODS, FIRE BRICKS, and BLUE BRICKS of every description.
TELEGRAMS—"CONCRETE, BIRMINGHAM."
TELEPHONE NO.—1436, CENTRAL.

THATCHING AND
REED LAYING
J. G. COWELL, SOHAM.

LAUNDRY
and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE.
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

HOLLIS BROTHERS
& CO.,
Timber Importers.
HULL. Jameson Chambers.
LEICESTER. Queen Street.
Wood Block Flooring.
H. B. Hardwood,
Floorings,
Oak, Maple, etc.
Large Stocks of Joinery Wood held under cover.
Mouldings, etc., to design.
Telephone: No. 82 CENTRAL (2 Lines.)
Telegrams: "ELF, BIRMINGHAM."

SUTTON & ASH,
41, SNOW HILL, BIRMINGHAM.
JOISTS, CHANNELS,
ANGLES, TEES,
RIVETTED GIRDERS,
LIGHT ROOFS, &c.

come to a settlement with that society. The hours of work agreed upon now are as follows:—March 17th to October 16th, 6 a.m. to 5 p.m., 1½ hours meals; October 17th to October 31st, 6.30 a.m. to 5 p.m., 1½ hours meals; March 1st to March 16th, 6.30 a.m. to 5 p.m., 1½ hours meals; November and February, 7.30 a.m. to 4.30 p.m., 1 hour meals; January, 8 a.m. to 4.30 p.m., 1 hour meals; December, 8 a.m. to 4 p.m., 1 hour meals. It was resolved that the other branches connected with the association should meet and consider the advisability of getting uniformity in the working hours as soon as possible.

Mr. W. Foulds was elected a member of the Bricklayers' Committee in place of Mr. F. W. Bowles, resigned.

A matter was brought up with reference to private firms employing operatives in competition with the builders, and it was decided that a special meeting with the branches affected should be held to consider the question.

The half-yearly meetings of the Plumbers' Institute are being held in Leicester this month.

STOURBRIDGE AND DISTRICT ASSOCIATION.

Secretary—Percival D. Folkes, Chartered Accountant.

The annual dinner of the Stourbridge Association was held at Stourbridge on March 23rd. A good attendance included Mr. C. Griffiths (president), Mr. T. J. Mason (vice-president), Councillor H. Smith (president of the Midland Centre), Mr. F. G. Whittall (president of the Birmingham Association), Mr. J. Bott (president of the West Bromwich Association), Mr. F. W. Amphlet (secretary of the Midland Centre), and Mr. P. D. Folkes (secretary of the Stourbridge Association).

The toast of "The National Federation" was proposed by Mr. J. H. Walker, and responded to by Councillor H. Smith and Mr. Fred. W. Amphlet. "The Stourbridge Branch" was proposed by Mr. F. G. Whittall, who spoke of the advantage the intertrading rule had been to those associations that had adopted it. Mr. C. Griffiths responded.

The toasts of the "Allied Trades" and the "Visitors" were also given.

THE SOUTH-WESTERN CENTRE OF THE NATIONAL FEDERATION.

BATH ASSOCIATION.

Secretary: E. J. B. Mercer.

The quarterly general meeting of the Bath Association was held at headquarters, "The Red House," on March 3rd, when Mr. Frank B. Parsons (president) presided over a fair muster of the larger employers. Amongst those were Mr. G. Hayward (vice-president), S. Ambrose, F. J. Blackmore, and A. W. Wills (ex-president), etc.

After the minutes had been read and adopted, the following firms were elected members, viz., Messrs. C. Gainer and Co., horticultural builders; Messrs. Young Bros., iron-founders; Messrs. Kirkham and Son, decorators; and Mr. Ernest Ireland, building contractor.

It was agreed to pay one year's subscription to the "Builders' Journal," for the use of the secretary.

The date and place of the annual outing were agreed to be settled at a later meeting.

A general discussion then took place as to difficulties arising out of business matters with architects and clients, a stronger cohesion between all members when mutual assistance and advice on delicate matters may be rendered, being much desired.

It was reported that tenders were being asked for the building or widening of a bridge and other works under the auspices of the Rural District Council, which contained an objectionable clause, viz., that the contractor should be responsible for the accuracy of the quantities, and by a unanimous resolution the secretary was instructed to write to Mr. E. H. Sheppard, surveyor to that authority, asking that the clause should be deleted from his specification. A very courteous reply was afterwards received from that gentleman, who, whilst afraid the objection was too late in the present instance, fully agreed that any excess of work beyond the specified quantities should be paid for in accordance with the schedule of prices, and stated that he would in future note the objection raised by this Association.

The officers of this Association for 1909 are the following:—President, Mr. Frank B. Parsons; vice-president, Mr. George Hayward; hon. treasurer, Mr. Sydney Sydenham; secretary, Mr. Edward J. B. Mercer; committee, Messrs. Stephen Ambrose, Frederick C. Chancellor, Herbert H. Knight, and William D. O. Morris; auditors, Messrs. Frederick Amery and Charles C. Wills. The association was founded as long ago as 1854, and was reorganised in 1890.

SWANSEA ASSOCIATION.

Secretary: W. H. Billings.

In February last the National Association of Operative Plasterers complained to the Swansea Master Builders' Association that a certain firm of builders, members of the Swansea Association, were employing a certain firm to do plastering. After hearing the members' explanation, which was to the effect that the plasterers' work had been given out to a master-plasterer, whose employment of men was his own affair, the association replied that their members would be supported in any action that the plasterers might take against them. The operatives replied with a threat to call our their men, and asked that the question might be discussed at a joint meeting. Such a meeting was arranged, and the plasterers then stated their objections to the master-plasterer to whom the work in question had been given. The employers' committee asked the plasterers' representatives to point out what rule had been broken by the firm of builders against whom the complaint was made. They were unable to indicate such a rule, but nevertheless reiterated their intention of withdrawing their men. The representative of the building firm in question appealed to the men to take a reasonable view of the situation. He asked that the master-plasterer should be allowed to complete the work in hand, and he would undertake that further steps should be subject to the approval of the operatives' society. The day after the meeting the firm informed the association that the master-plasterer had promised to give up the contract after finishing a certain definite portion of the work, which would be done in ten to fourteen days. This offer the plasterers refused, declaring that the contract must stop at once, otherwise the members of the plasterers' society would withdraw at one hour's notice. At an immediate meeting of the association, it was decided that if the men would not accept the very conciliatory terms that had been already offered them, matters must be left to take their course. A further joint meeting was arranged, at which the plasterers' representatives demanded that the builders' association should agree to a rule to the effect that in future no member of the association should place work with a master-plasterer who does not conform to the rules existing between the builders' association and the plasterers' society. The association declined this offer. Finally, the plasterers' society having giving indications of a more conciliatory spirit, the dispute was settled at an interview between the chairman of the builders' association and the secretary of the plasterers, at which it was agreed that the men should return to work immediately, the firm against whom the complaint was made being allowed to finish their contract.

LONDON
JAMES BROWN (LONDON), LTD.,
MAKE THE BEST
HOLLOW POROUS BRICK PARTITIONS
In 1½ in., 2½ in., 3 in. and 4 in. thicknesses.
Takes a Nail Perfectly
ESSEX WHARF, WHITECHAPEL, E.
—— Telephone, 9513 Central. ——

Telephone, No. 1062 HOLBORN
Contractors to H.M. Government, &c.
THE PERFECT TILE CO.,
13 & 15, Featherstone Buildings,
Holborn, LONDON, W.C.
OPAL WALL TILES. GLAZED WALL TILES
Tessellated and other Floor Tiles.
Terrazzo and Cube Mosaics to anv Design.
Fireproof Partitions. Fireproof Jointless Floors
AGENT FOR "MODERNIA" GLASS TILES

BUILDING . BOOKS . AT
GREAT REDUCTIONS ! !
New Books at 25 per cent. Discount.
Books on Building, Architecture, Surveying, Estimating, Technical, all other Subjects and for all Examinations Supplied. Sent on Approval. State Wants. Catalogues Free.
BOOKS PURCHASED.
R. P. FOYLE, 135, Charing Cross Road, London, W.C

Send for Prices and Particulars o
FRAZZI FIREPROOF
FLOORS & PARTITIONS.
Frazzi Fireproof Construction, Ltd.,
Essex Wharf, Durward Street,
WHITECHAPEL.

BIRKBECK BANK.
ESTABLISHED 1851.
SOUTHAMPTON BUILDINGS, HIGH HOLBORN, W.C.
2½ PER CENT. INTEREST.
allowed on Deposit Accounts.
2 PER CENT. INTEREST
on Drawing Accounts with Cheque Book.
All general Banking Business transacted.
ALMANACK with full particulars, **POST FREE**
C. F. RAVENSCROFT, Secretary.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs.
Premier Ironworks,
DEPTFORD, S.E.

Sprague Electric
ELEVATORS.
SPRAGUE ELEVATOR CO. LTD.,
QUEEN ANNE'S CHAMBERS,
WESTMINSTER,
LONDON, S.W.

DOLOMENT
Jointless Flooring
And Wall-Covering Material

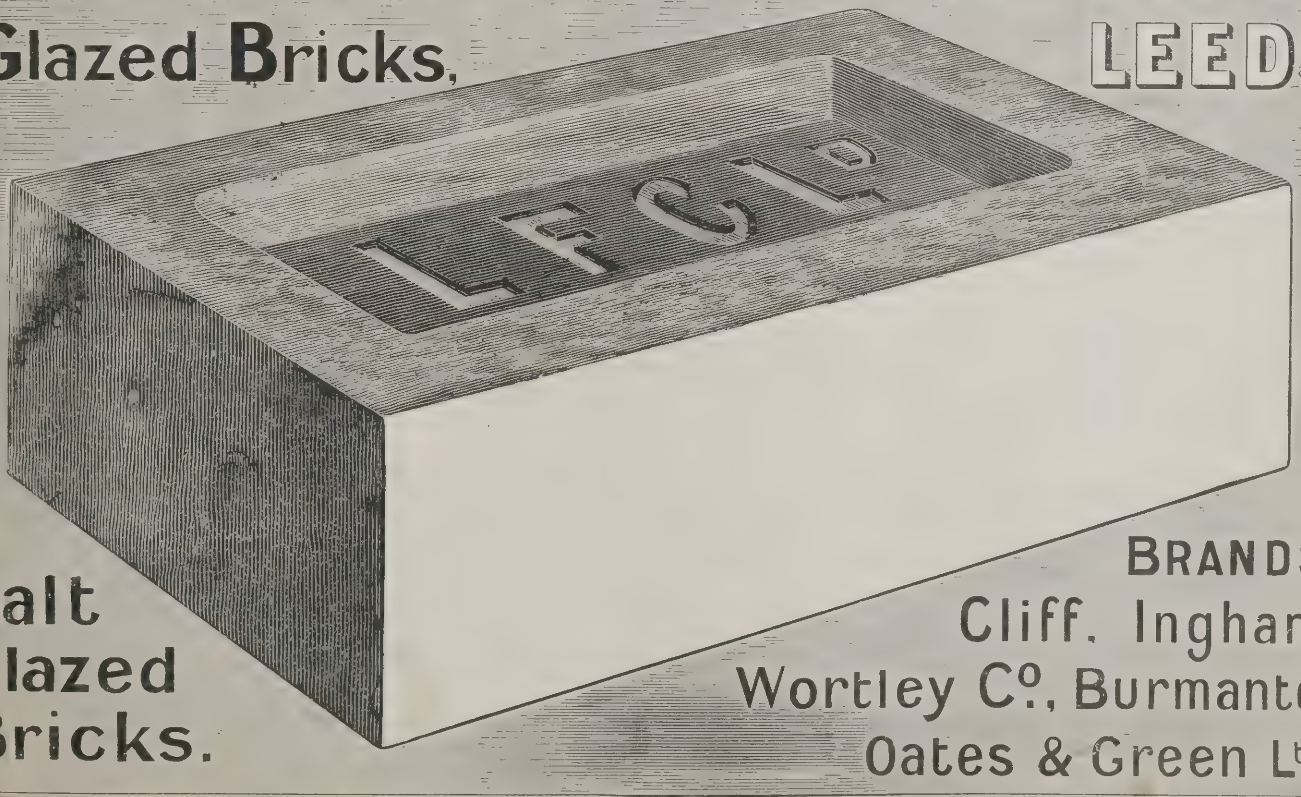
For High Class Buildings
Guaranteed not to bulge or crack
Fireproof
Impervious
Hygienic
Resilient
Durable
Write for Catalogue and Sample

THE BRITISH DOLOMENT Co. LTD.
1 Caxton House Westminster S.W.

Farrer's Automatic Sewage Distributor
ENSURES THE BEST EFFLUENT.

HUNDREDS IN USE.
WILLIAM E. FARRER,
Star Works, Cambridge Street,
BIRMINGHAM.
Also
LONDON, CARDIFF, LEEDS.

THE LEEDS FIRECLAY Co., Ld.
Glazed Bricks,
LEEDS.



Salt
Glazed
Bricks.

BRANDS:-
Cliff, Ingham,
Wortley Co., Burmantofts
Oates & Green Ltd.

Publisher's Notices.

Offices: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address: "Buildable, London."

Telephones: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

---

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER, S.W.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Broadstairs, Kent.—For master's house and connecting bridge, for Mr. W. Hughes. Mr. Chas. S. Yates, architect, St. Benet Chambers, Fenchurch Street, E.C.:—

Master's House.

Mark and Watkins	£1,263	0	0
Price Bros.	1,094	10	0
J. Jarvis	1,080	0	0
G. Fuggle	1,044	4	10
G. Mirriams	994	0	0
R. Goodburn	927	7	6
Rice and Son	899	0	0
W. J. Bloxham	897	0	0
J. Wood and Son	838	0	0
J. T. May	809	0	0

Bridge.

Mark and Watkins	£104	14	0
Price Bros	135	10	0
J. Jarvis	116	0	0
G. Fuggle	109	11	4
G. Mirriams	102	0	0
R. Goodburn	100	14	8
Rice and Son	92	6	0
W. J. Bloxham	90	15	0
J. Wood and Son	91	0	0
J. T. May	84	0	0

Chopwell.—For the erection of three houses and shops. Mr. D. M. Spence, architect and surveyor, Shotley Bridge. Quantities by architect:—

C. Groves	£1,903	8	9
S. Fenwick and Co.	1,902	9	6
J. Craven	1,850	1	6
T. H. Whorley	1,831	8	10
E. T. George	1,820	0	0
G. A Beach	1,744	12	0
J. A. M. Henderson,* Jarrow-on-Tyne	1,736	0	0
R. J. Saint	1,579	8	0

*Accepted.

Dartford, Kent.—For cleaning and painting works and repairs at Darenth Asylum, for the Metropolitan Asylums Board. Mr. W. T. Hatch, M.Inst.C.E., Engineer-in-Chief:—

H. J. Smith and Son	£2,928	11	0
R. A. Lowe and Co.	2,789	0	0
G. H. Gunning and Sons ...	2,609	5	8
F. Holdsworth	2,539	17	0
B. E. Nightingale	2,189	0	0
W. J. Simms and Sons	1,902	0	0
J. W. Ellingham	1,789	0	0
S. T. Wright	1,577	8	8
Vigor and Co.	1,576	0	0
A. H. Inns	1,549	0	0
L. Kazak,* 3 and 4, Station Road, Belvedere	1,329	9	8

*Accepted.

High Littleton.—For the erection of a chapel, for the Primitive Methodist Society. Mr. G. H. Gibson, Building Surveyor, Victoria Square, Radstock, near Bath:—

C. G. Coles	£1,116	11	6
Bristol Joinery and Shop Fitting Co.	995	2	0
Gleed Bros.	978	4	7
W. J. Heal	949	8	3
J. G. Osman	871	5	6
W. J. Flower	787	12	10
Adams and Jefferies	777	0	0
G. Moore and Son	770	0	0
E. G. Padfield	754	4	6
J. Bird and Son	750	0	0
Coles Bros.,* Peasedown, S. John	700	0	0

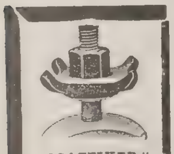
*Accepted.

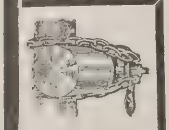
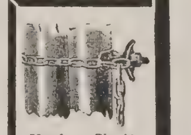
Newcastle-on-Tyne.—For the erection of new P.M. schools and class-rooms, Chilton Lane Ends. Mr. J. W. F. Phillipson, architect, 8, Grainger Street, Newcastle-on-Tyne:—

E. T. George	£1,175	0	0
E. Rutherford	1,166	5	8
J. W. Moore	1,129	0	0
S. Fenwick	1,123	0	0
J. Moore	1,110	18	0
F. Sowerley	1,092	19	3
W. Kennedy	1,090	0	0
T. Manners	1,079	14	0
M. Draper and Sons	1,075	0	0
W. Hope and Sons	1,063	12	6
J. Fairnington	1,046	4	0
G. Lazenby	1,046	9	5
F. Pearson	1,030	0	0
W. Brazell	1,027	10	0
J. Oliver	1,006	10	6
C. Douglas,* New Shildon ...	1,001	4	2
A. Metcalfe	1,001	2	3
F. H. Todd and Son	1,000	0	0

*Accepted.

(Continued on p. viii.).



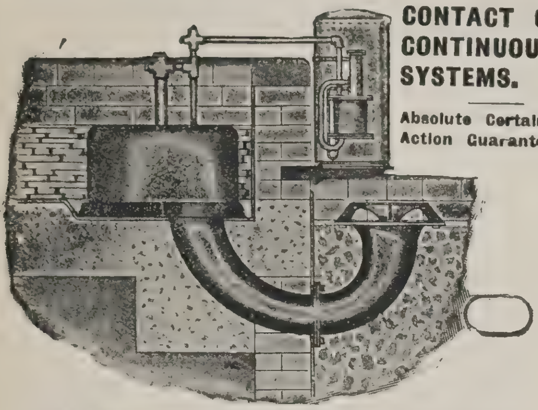
REVOLUTIONISES SCAFFOLD FIXING.
Supersedes the Scaffold Cord and Wedge. Practically Indestructible. Never slackens nor slips.
Immense Saving in Time and Labour.
"SCAFFIXER" Block.
Patent Utility Scaffolding Bracket.
D. P. JONES' Patent Rapid
SCAFFOLDING BLOCK
And Utility Bracket.
FIXED IN ONE MINUTE.—RELEASED INSTANTLY.
Write for particulars and photographs to THE
Patent Rapid Scaffold Tie Co., Limited,
124, Victoria St., Westminster, S.W.
Contractors for the Supply, Hire, or Erection of Scaffolding.
Tel. [illegible] Westminster. Teleg. "Scaffixer, London."
Used as Ledger and Standard Tie.
Used as Single or Band Ties.

Telegrams—"Hoptonwood, Wirksworth." Telephone—No. 9 Wirksworth.
THE HOPTON-WOOD STONE FIRMS, Ltd.
QUARRY OWNERS and WORKERS of WHITE, GREY and DARK HOPTON-WOOD STONE, BIRD'S EYE, BLACK and FOSSIL MARBLES.
Wirksworth, DERBYSHIRE.
London Agency Office: 134, CHEAPSIDE.
Telegrams—"Guttridge, London." Telephone—2759 Central.

THE BUILDERS' JOURNAL BOOK LIST.
Being a comprehensive Catalogue of the most recent and authoritative text-books on various subjects connected with Architecture and the allied Arts of Design, Building Construction, and Engineering, together with their published prices, 1908.
Price 3d. Post Free, 3½d.
Technical Journals, Ltd.,
Caxton House, Westminster, London.

JAMES CHEW & Co.,
Brookhouse Brass and Copper Works,
BLACKBURN.
Copper Cylinders and Boilers and Pans of every description.
Sanitary Brass work.
Copper Cylinders for any pressure.
Copper Boilers for every class of Range
Galvanised Cisterns.
Roofs and Turrets covered with Copper.

BACTERIAL TREATMENT
OF SEWAGE.



CONTACT OR CONTINUOUS SYSTEMS.
Absolute Certainty. Action Guaranteed.

PATENT ALTERNATING SYPHONS.

PATENT TIMING SYPHONS
(requiring no auxiliary brick chambers).
PATENT ROTARY DISTRIBUTORS
FOR TRICKLING FILTERS.
PATENT SEWER FLUSHING SYPHONS.

BURN BROTHERS,
Sanitary Engineers,
3, Blackfriars Rd., LONDON, S.E.
ALSO AT EDINBURGH.

ARCHITECTURAL PHOTOGRAPHY.
Expert operators dispatched at the shortest notice to architects' requirements. Architectural subjects a speciality.

TRAVEL SOUVENIRS.
Our series of photographs includes all the principal architectural examples and the best scenery of the world. Most extensive series of photographs of English Cathedrals in existence. Over 250,000 negatives to select from. A large number of famous picture reproductions also included.

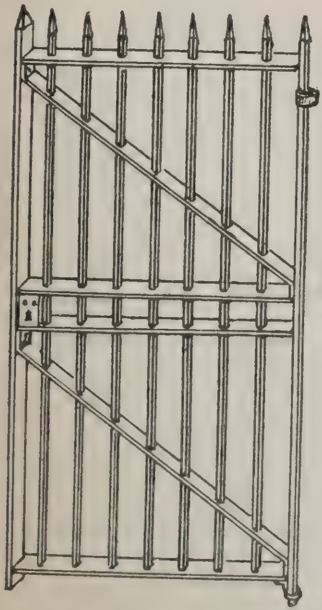
PLANS, DRAWINGS, PHOTOGRAPHS,
reproduced in any process.

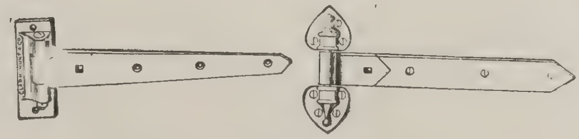
Half-Tone and Colour Illustrations
for catalogues and general advertising. Designs and suggestions submitted free of cost. Blocks of the highest grade for all illustration purposes.

SPECIALISTS IN COLOUR PHOTOGRAPHY.

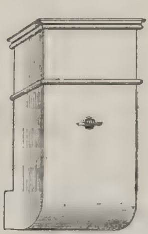
PHOTOCHROM CO., LTD.,
35, Hosier Lane, Snow Hill, E.C.
and Detroit, U.S.A.

IRONWORK FOR COUNCIL SCHOOLS
GENERAL BUILDERS' IRONWORK.

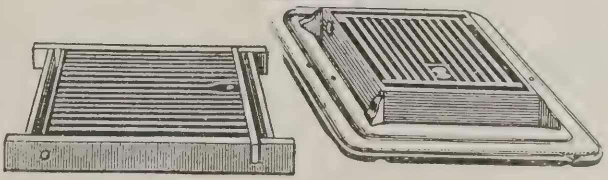


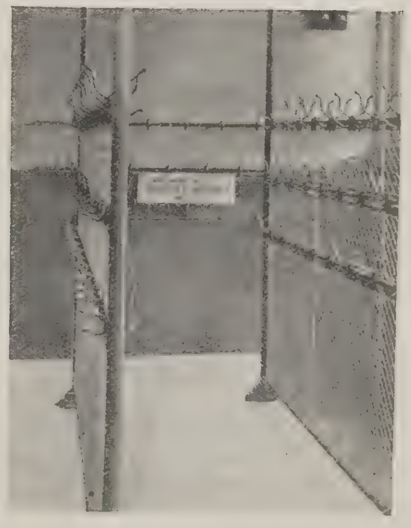


GATES . .
and . . .
RAILINGS.



TOBIN TUBES
and
GULLY
GRATES





PATENT HAT AND COAT RAILS.

CLARK, HUNT & CO., Ltd., *Middlesex Ironworks,* **Shoreditch, London.**

GENERAL CATALOGUE ON APPLICATION.

(Continued from p. vi.).

Annfield Plain, Durham.—For erection and completion of new business premises at Annfield Plain, for Mr. Wm. Maddison. Mr. Thomas E. Taylor, architect, The Grove, Lanchester.

F. Ward, Lanchester	£980	0	0
T. Mordue, Annfield Plain ...	919	0	0
W. Collins, Annfield Plain ...	918	18	0
J. French, Consett	880	0	0
P. Duffy, Stanley	860	0	0
J. Bulmer,* Hare Law	850	0	0

*Accepted

Middleton, near Manchester.—Accepted for taking down the present building and erecting a new bank, for the Union Bank of Manchester, Ltd. Potts, Son, and Hennings, architects, Manchester:—

Grundy, Sons and Co., £2,090.

Putney.—For the erection of additions to the Royal Hospital for Incurables. Mr. R. L. Hesketh, F.R.I.B.A., architect, 110, Cheapside, E.C. Quantities by Messrs. Andrews and Read, 13, Basinghall Street, E.C.:—

Parkinson and Son	£7,045	0	0
W. H. Lorden and Son	6,191	0	0
Lovatt, Ltd.	6,178	10	0
Leslie and Co.	5,958	0	0
Holloway Bros.	5,835	0	0
Higgs and Hill	5,831	0	0
Bywater and Co.	5,828	0	0
Foster and Dicksee	5,809	0	0
Cubitt and Co.	5,804	0	0
Wallis and Son	5,798	0	0
Dove Bros.	5,757	0	0
Holland and Hannen	5,696	0	0
Patman and Fotheringham ...	5,656	0	0
Garlick, Ltd.	5,603	14	0
E. Laurence and Son	5,543	0	0
J. Carmichael	5,512	0	0
F. G. Minter*	5,415	0	0

*Accepted.

Penzance, Cornwall.—For erection of house, for Mr. Gibson Ferrier, of Regent Terrace, Penzance. Messrs. Homer and Lucas, architects, 35, Bucklersbury, London; and Penzance:—

Pidwell	£920	0	0
Nicholas	918	9	0
Hosking	735	0	0
Brown,* London	520	0	0

*Accepted.

Southampton.—For the erection of a house (type C), for Whithedswood Estates, Ltd. Mr. R. M. Lucas, F.R.I.B.A., Bargate Chambers, Southampton. Quantities by the architect:—

F. W. Burton	£1,565	13	3
J. Treherne	1,490	0	0
Golding and Ansell	1,472	0	0
Dyer and Son	1,400	0	0
H. Stevens and Co.	1,349	0	0
Exors of W. Franklin	1,333	0	0
J. Nichol	1,315	0	0
H. J. Hood	1,290	0	0
Jenkins and Sons, Ltd.,* Southampton	1,240	0	0

*Accepted.

Tantobie.—For the erection of shops, warehouses, and stable for Messrs. Walter Willson, Ltd. Mr. D. M. Spence, architect and surveyor, Shotley Bridge. Quantities by architect:—

Duncan and Co.	£939	13	0
Hunter and Son	854	0	0
Oake and Co.	801	10	4
S. Easten, Ltd.	775	0	0
E. T. George	760	0	0
T. Hutchinson	745	12	6
Bowers and Curley	718	15	0
B. Bolam	699	0	0
J. Fairnington	682	5	2
T. Duffy,* Stanley, R.S.O. ...	660	0	0
T. Whorley	648	0	0

*Accepted.

Truro.—For restoration of five cottages at Clarke's Place, Truro, for Mr. T. Pascoe, Truro, Mr. A. Ernest Harris, architect, Truro:—

H. Tippet	£504	7	6
J. F. Parkin*	415	0	0
C. and J. Harris and W. Dyer ...	429	0	0

All of Truro.

*Accepted.

Ynyshir.—Accepted for the erection of a new chapel, vestry, and class-rooms, for the trustees of Tabernacle C.M. Church, Ynyshir. Mr. R. S. Griffiths, M.S.A., architect and surveyor, Tonypandy:—

D. Richards, Ynys Villa, Ynyshir, Rhondda, £4,132 2s. 6d.

Ynysybwl, Wales.—For the erection of additions to and altering the Ynysybwl mixed school, for the Mountain Ash Education Committee. Mr. W. H. Williams, architect, Town Hall, Mountain Ash:—

Williams Bros., Ynysybwl ...	£1,074	15	0
A. R. John, Mountain Ash ...	1,050	0	0
Morgan Griffiths, Pontypridd ...	969	17	7
T. W. Davies,* Prosser Street, Mountain Ash	935	0	0

*Accepted.

Insurance.

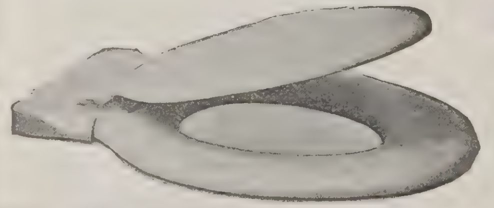
Free £500 Accident Insurance Coupons have been sent to the following:

E. T. (Llandudno), R. A. (Wandsworth), T. O. (Perth), H. G. H. (Bolton), D. K. (Holloway), J. McM. (Sunderland), J. H. S. (Nottingham), A. A. M. (Woking), A. D. (Ealing), J. N. (Sheffield), C. S. (Skegness), K. H. R. (Stroud), R. W. S. (Darwen), A. J. D. Birmingham), E. E. S. (Nuneaton), A. L. P. (Crewe), W. H. (Ashford), W. H. (Harlesden), C. H. W. (Bristol), T. H. (Iron Bridge), E. T. C. (Rotherham), C. C. (Moorlands), G. D. T. (Hatcham).

'Phone Holborn 1562.
The Brilliant Sign Co. 1907 Ltd.
Original Manufacturers of Brilliant Sunk Gilt Copper Window Letters.

THE LARGEST MANUFACTURERS IN THE WORLD OF
PLATE GLASS FACIAS
STALLPLATES
SWING SIGNS
GILT WOOD LETTERS
ILLUMINATED SIGNS
(of every known style)
REPOUSSÉ COPPER WORK
WINDOW LETTERS
Guaranteed Best Work—Keenest Rates in the Trade.
60 pp. Illustrated Art Catalogue Free.

Wire: "Signboards, London."
38 Grays Inn Rd London W.C.
BRILLIANT SUNK GILT COPPER PLATE GLASS FACIAS, &c.



SANITARY SEATS.
ORDERS THROUGH MERCHANTS.
EAST BROTHERS,
Lochee Cabinet Factory,
DUNDEE, SCOTLAND.
THISTLE (REGD) BRITISH MANUFACTURE

LIGHTNING CONDUCTORS
Supplied, Erected and Tested. Chimney Shafts Restored, &c.
J. LEWIS, 5 & 6, Great Winchester Street, LONDON, E.C.
TELEPHONE No. 3053 CENTRAL.

FOLDING PARTITIONS. 2/- ft. Super.
REVOLVING SHUTTERS. 1/- ft. Super.
Hartley Bros., GORTON, MANCHESTER.

"The Architectural Review."
A Magazine of Architecture and Arts of Design. Edited by MERVYN E. MACARTNEY, B.A., F.R.I.B.A., F.S.A.
Price 1/- Monthly. Annual Subscription 16/- post free.
Technical Journals, Ltd., Caxton House, Westminster.

Just Published. Medium 8vo, 240 pages, with numerous Illustrations in the text, and 13 coloured reproductions of Marbles. Price 15s.
MARBLE AND MARBLE WORKING
A HANDBOOK FOR ARCHITECTS, SCULPTORS, MARBLE QUARRY OWNERS & WORKERS, & ALL ENGAGED IN THE BUILDING & DECORATIVE INDUSTRIES.
By W. G. RENWICK.
London: CROSBY LOCKWOOD & SON, 7, Stationers' Hall Court, E.C., & 121a, Victoria Street, S.W.

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about **five days** after the date of this issue.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

May 6. YEOVIL.—Erection of new offices at Reckleford, Yeovil, for J. B. Petter and Sons, Ltd. Names and addresses, with a deposit of £1 1s., by May 6, to John Petter and P. F. Warren, A.R.I.B.A., architects and surveyors, Union Bank Chambers, Southampton.

May 8-25. NEWCASTLE-ON-TYNE.—Enlarging and improving Wellington Quay Addison Potter council school, for the Northumberland education committee. Name and address, together with £2 2s. deposit for specification and bills of quantities, to the undersigned, not later than May 8, where also plans may be obtained. Tenders endorsed "Tender for extension of Addison Potter Council School," to the secretary by May 25.—C. Williams, secretary to the education committee, The Moothall, Newcastle-on-Tyne.

May 10. LLANELLY.—Erection of a residence and stables at Pembrey, near Llanelly for J. Walton Bishop. Names by May 10, together with deposit (cheque) £3 3s. for bill of quantities, to Arthur S. Williams, M.S.A., architect, Llandilo.

May 10. LLWYNYPIA.—Erection of 30 or more houses, together with boundarv walls and drains, for the Turberville Building Club at Pont Rhondda, Llwynypia. Plans and specifications of W. Morgan Lewis and T. Naunton Morgan, architects and surveyors, Dunraven Street, Tonypandy, and Dyffryn Chambers, Pontypridd, and also at 12, Edward Terrace, Cardiff, by appointment. Tenders to John Lewis, secretary, Maesteg House, Sherwood, Llwynypia, by noon on May 10, endorsed "Tenders for Pont Rhondda Building Club."

May 10. MAGOR, near NEWPORT, etc. (MON.).—Erection of a new council school, to accommodate 100 children at Magor, near Newport, and for a new council school, to accommodate 48 children at Whitebrook, in the Parish of Llandogo, near Monmouth, for the education committee. Plans and specifications and bills of quantities at the office of C. Dauncey, secretary, C.C. offices, Newport, Mon., on deposit of £2 2s. in the case of Magor school and of £1 1s. in the case of Whitebrook school. Tenders, in separate envelopes, for each school, to be sent to the secretary by May 10.

May 11. SOUTHEND-ON-SEA.—Erection of a school (460 places) for the Education Committee. Particulars on application to P. Brockank, architect, County Chambers, Western Road, Southend-on-Sea. Tenders to be sent in by May 11.

May 11. LONDON, N.—Erection of a brick wall and iron railing along the south side of Cloudesley Place, N., for the corporation of Islington. Drawings and specification and form of tender of the borough engineer, J. Patten Barber, town hall, Upper Street, N., on deposit of £1 1s. Tenders, endorsed "Railings at Cloudesley Place," by 4 p.m. on May 11, to Wm. F. Dewey, town clerk, town hall, Upper Street, N.

May 12. KIRKLINGTON.—Erection of outbuildings at Stone Flatts, Kirklington. Plans and specifications, John Ferguson, Stone Flatts, Kirklington, to whom tenders are to be sent by May 12.

May 12. ABERGAVENNY.—Erection of a pair of semi-detached villas and one single villa at the Landsdown Road, Abergavenny. Plans and specifications at 27, Lancaster Villas, Merthyr, where tenders are to be sent by May 12.

May 12. BELFAST.—Erection of a Quay wall on the River Lagan, near Laganbank Road, for the corporation. Drawings and specification, and form of tender and bill of quantities, at the office of the city surveyor, on deposit of £1 1s. Tenders, endorsed "Quay Wall," by May 12, to R. Meyer, town clerk pro tem.

May 12. KNUTSFORD.—Work and materials in excavating for an erection of a brick retort-house, for the Knutsford Light and Water Co. Drawings at the Gasworks, Knutsford, and specification and bill of quantities from William Newbigging, engineer, 5, Norfolk Street, Manchester, on deposit of £1 1s. Tenders, endorsed "Retort-house, Contract No. 1," to be sent to W. S. Inman, secretary, Church Hill, Knutsford, by noon on May 12.

May 12. UPPER EDMONTON.—Erection of a transformer house, switch-room, coal store, and book store at the workhouse, Upper Edmonton, for the guardians. Plans and specifications at the offices of the guardians' architect, Stuart Hill, 106, Cannon Street, E.C. Quantities of the architect on and after May 5, on deposit of £1 1s. (cheque). Tenders, endorsed "Tender for Transformer House, etc.," by 9 a.m. on May 12, to F. Shelton, solicitor and clerk, The Grange, Lower Tottenham.

May 12—June 7. REDHILL.—Erection of an elementary school at St. John's, Redhill, for the Reigate Education Committee. Names, together with a deposit of £1 1s. for bills of quantities, by May 12, to A. Lund Newell, secretary, Municipal Buildings, Reigate, to whom tenders, marked "Tender for Schools," must be delivered by noon on June 7. Plans, specification, conditions of contract, and form of tender, at the office of the architects, T. R. and V. Hooper, Market Hall, Redhill.

May 13. ST. CLEER.—Erection of an addition, etc., to a dwelling-house for J. H. Morgan, at Common Moor, St. Cleer. Plans and all particulars at the residence of R. Downs's. Tenders to be sent in by May 13.

May 13. ABERTYSSWG.—Erection of a workmen's institute and hall. Particulars may be obtained on application to the architect, A. F. Webb, High Street, Blackwood, Mon. Tenders to be sent in by May 13.

May 13. COTTINGHAM.—Erection of new offices, council chamber, surveyor's house, and fire-station, Market Green Cottingham, for the U.D.C. Quantities upon application to the architects, Gelder and Kitchen, Hull, and a deposit of £1. Tenders to be sent in by May 13.

May 13. CAERAU, near MAESTEG.—Erection of a church to seat 545 persons, at Caerau, near Maestag, for the Rev. J. Jones, vicar, and committee. Plans and specifications and bills of quantities of George E. Halliday, F.R.I.B.A., 16, Castle Street, Cardiff, to whom tenders are to be sent by May 13.

May 14. CUMWHINTON.—Erection of a dwelling-house at the Stripes, Cumwhinton, for the small holdings and allotments committee of the Cumberland C.C. Plans and specifications at the office of C. W. Allan Hodgson, clerk to the committee, the Courts, Carlisle, to whom tenders, endorsed "Cumwhinton," should be sent, by May 14.

May 14. HOUNSLOW, MIDDLESEX.—Erection of a cemetery chapel at Hounslow, Middlesex, for the New Brentford Burial Board. Architects, Nowell Parr, M.S.A., and Kates, Brunswick House, Brentford, W. Application for quantities, accompanied by 10s. 6d. deposit, to Geo. Brodie Clark, clerk to the board, town hall, Brentford, W., by May 7. Tenders, marked "Tender for Chapel," by May 14, to Geo. Brodie Clark, clerk to the board, town hall, Brentford.

May 15. CAVAN (IRELAND).—Repairing and refurnishing Ballintemple Church. Specifications with R. N. Wellwood, C.E., Spring Villa, Cavan, and with Rev. W. T. Stewart, Ballintemple Rectory, Cavan, to whom tenders are to sent by May 15.

May 15. MILFORD HAVEN.—Erection of new Congregational Church, schoolrooms, vestries and caretaker's cottage at Milford Haven. Drawings and specification at the office of the architects, D. Edward Thomas and Son, 17, Victoria Place, Haverfordwest, also at the Tabernacle Church Vestry, Robert Street, Milford Haven. Bills of quantities from the architects on deposit of £1 1s. Tenders, endorsed "Tender for Tabernacle Church," to George Cole, hon. secretary to the Building Committee, Fernleigh, Milford Haven, by May 15

May 17. PONTEFRACT.—Conversion of premises, Southgate, and Friends' Meeting House Lane, Pontefract, into 8 houses, for Charles W. Addingley, The Beeches, Pontefract. Plans, elevations, sections, and specification, and all information of James Heseltine, architect and surveyor, Old Castle Drawing Office, Pontefract, to whom tenders are to be sent by May 17.

May 17. NEWLANDSFIELD.—Erection of new tramway depot, Newlandsfield; execution of the following works:—1, digger, mason and brick works; 2, carpenter and joiner works; 3, cast-iron and steel works; 4, patent roof glazing; 5, slater work; 6, plumber work; 7, plaster work; 8, painter work; for the Corporation of Glasgow. Plans and specifications and forms of tender on application to James Dalrymple, general manager, 46, Bath Street, on deposit of bank draft for £2 2s. Offers, marked outside "Tramways—Tender for ———— Work," by May 17, to A. W. Myles, town clerk, City Chambers, Glasgow.

May 18. ST. ABBS, BERWICKSHIRE.—Erection of a rocket life-saving apparatus house at St. Abbs, for the Board of Trade. Copies of plan and specification and forms of tender at the coastguard station at Berwick. Tenders to the assistant secretary, Marine Department, Board of Trade, 7, Whitehall Gardens, London, S.W. by May 8, marked "L.S.A. Tenders."

May 18. COVENTRY.—Erection of outpatients' department at the Coventry and Warwickshire Hospital, for the committee.

Plans and specifications by A. Hesse'll Tiltman, F.R.I.B.A., 2, Verulam Buildings, Gray's Inn, London, W.C., and Herbert W. Chattaway, Trinity Churchyard, Coventry. Plans and specification, Trinity Churchyard, Coventry, where bills of quantities and forms of tender can be obtained upon deposit of £2 2s. Tenders, endorsed "Out-Patients' Department," by 10 a.m. on May 18, to John A. Rudd, secretary, Coventry and Warwickshire Hospital, Coventry.

May 19. CRUMPSALL (near Manchester).—Erection of a block for the accommodation of able-bodied men and other additions and alterations to the existing buildings at the workhouse at Crumpsall, for the guardians of the poor. Plans at the office of A. J. Murgatroyd, architect, 23, Strutt Street, Manchester, from whom quantities may be obtained upon deposit of £1 1s. Tenders, endorsed "Tender for Workhouse Extension," by 3 p.m., on May 19, to James MacDonald, clerk to the guardians, Poor Law Offices, New Bridge Street, Manchester.

May 20. IRVINESTOWN (IRELAND).—Structural improvement, extensive repairs, and painting of Irvinestown Church, for the select vestry of the Parish of Derryvullen North, according to specification, to be seen at the Castle Irvine School. Tenders to reach Robert Wilson, hon. secretary, Castle Irvine N. School, Irvinestown, by May 20.

May 20. SEACOMBE (Cheshire).—Construction of retort-house (except iron roof) at the Gas Works, Dock Road, Seacombe, Cheshire, for the Wallasey U.D.C. Plans and specification and bill of quantities of the engineer, J. H. Crowther, Dock Road, Seacombe, on deposit of £2 2s. Tenders, addressed to "The Chairman of the Gas and Water Committee," and endorsed "Tender for Retort-house," to be delivered by 4 p.m. on May 20, to H. W. Cook, clerk and solicitor, public offices, Egremont, Cheshire.

May 21. HAWKSTEAD, WINDERMERE.—Erection of a new billiard room at Outgate, for Humphrey L. Boddington. Particulars may be obtained on application to the architect, John Stalker, M.S.A., 57, Highgate, Kendal. Tenders to be sent in by May 21.

May 21. PORT TALBOT.—Erection of a rocket life saving apparatus house, at Port Talbot, for the Board of Trade. Plan and specification and forms of tender on application at the Harbour Master's office, Port Talbot. Tenders to the assistant secretary, Marine Department, Board of Trade, 7, Whitehall Gardens, London, S.W., by May 21, marked on the outside "L.S.A. Tenders."

May 21. CURRAHEEN, CO. KERRY.—Erection and furnishing of National School Buildings at Curraheen, for the board of public works. Plans, etc., at the district office of works, Blennerville, Tralee, and at Killarney Royal Irish Constabulary Barracks, where (and at office of H. Williams, secretary, Dublin) printed forms of tender can be had. Tenders to be sent in by May 21.

May 22. DITTON, near WIDNES.—Erection of a new elementary school for 120 scholars, at Ditton, near Widnes, for the Lancashire Education Committee. Plans and bills of quantities at the office of the county architect, Henry Littler, 16, Ribblesdale Place, Preston, by deposit of £2. Tenders before noon on May 22, to Henry Wood, 2, West Street, Prescot, Lancs.

No date. WAKEFIELD.—Erection and completion of athletic club buildings at Hemsworth Collieries, near Wakefield, for the South Kirkby, Featherstone, and Hemsworth Collieries (Limited). Bills of quantities and all particulars from Garside and Pennington, architects, Pontefract and Castleford, on deposit of £1 1s.

ENGINEERING.

May 8-14. PATELEY BRIDGE.—Construction of a concrete covered service reservoir of about 90,000 gallons capacity, together with a line of 5in. cast-iron pipe about 800 yards in length, for the R.D.C. Plans and specifications and forms of tender and other information from the engineers, Edward Wilson Dixon and Ritchie, 3, East Parade, Leeds; or from the clerk up to May 8. Tenders, endorsed "Water Eagle Level," by May 14, to Wm. Oddie, solicitor, clerk, Pateley Bridge, Yorkshire. £1 1s. deposit for quantities.

May 13. SLAITHWAITE.—Wrought-iron and engineering work in the equipment of a public abattoir at Slaithwaite, for the U.D.C. Tenders by May 13, to E. Gledhill, clerk, of whom all particulars may be obtained.

May 14. SOUTH TAWTON.—Construction of a water service reservoir and providing and laying water mains, etc., at South Zeal, Ramsley, Shelly, and Prospect, in the parish of South Tawton, according to plans prepared by H. J. Ward, A.I.S.E., for the Okehampton R.D.C. Specifications and bills of quantities on application to Mr. Ward, at whose office in Okehampton plans may be seen by appointment. Tenders by May 14, to S. Hawken, clerk to the council, Okehampton.

May 17. SOUTHAMPTON.—Erection of ferro-concrete road bridges on Hennebique's principle, for the C.C. 1, Greatbridge, three spans averaging 28ft. each, pile piers and abutments, together with a short road approach; 2, Timsbury Bridge, two 30ft. spans, pile pier and abutments, together with culverts and approach roads. Plans and specifications and conditions of contracts, and all other necessary information of W. J. Taylor, county surveyor, The Castle, Winchester. Plan and specification of each contract on deposit of £5 5s. (cheque) payable to the Hants County Council, and crossed Bank of England. Tenders, endorsed "Greatbridge" or "Timsbury Bridge," by 10 a.m. on May 17, to H. Barber, clerk to the C.C., The Castle, Winchester.

May 18. TRALEE.—Construction of a new timber viaduct and approaches thereto, in accordance with the plans and specifications prepared by the engineer, G. A. E. Hickson, M.I.C.E.I., for the Tralee and Fenit Pier and Harbour Commissioners. Plans, specification, form of tender, and contract deed, at the office of the Harbour Board, Canal Office, Tralee, and at the Board of Works (Engineer's Department), No. 6, Upper Merrion Street, Dublin. Specification, form of tender, and engineer's schedule of quantities on payment of £1 1s. Tenders by 11 a.m. on May 18, to J. Leonard, secretary, Tralee and Fenit Pier and Harbour Commissioners, Canal Office, Tralee.

May 20. NORTHWOLD.—Heating the Northwood Church on the radiator system. Estimates to be delivered by May 20, to the Rev. J. S. Barber, Sycamore House, Northwold.

May 20. SEACOMBE (Cheshire).—Construction, delivery, and erection complete of an iron or steel roof at the Gas Works, Dock Road, Seacombe, Cheshire, for the Wallasey U.D.C. Plans and specifications the engineer, J. H. Crowther, Dock Road, Seacombe. Tenders, addressed to "The Chairman of the Gas and Water Committee," and endorsed "Tender for Retort-house Roof," to be delivered by 4 p.m. on May 20, to H. W. Cook, clerk and solicitor, public offices, Egremont, Cheshire.

May 21. HAWKSHEAD, WINDERMERE.—Heating the mansion at Outgate for Humphrey L. Boddington. Particulars may be obtained on application to the architect, John Stalker, M.S.A., 57, Highgate, Kendal. Tenders to be sent in by May 21.

IRON AND STEEL.

May 10. LONDON (for MADRAS).—Supply and delivery at Madras of four penstocks, 5ft. by 4ft. opening, two Glenfield and Kennedy's 24in. equilibrium ball valves, four 9in. sluice valves, together with a few special pipe bends and castings, for the corporation of Madras. Drawings and copies of the specification, bill of quantities, and form of tender, at the offices of the agents upon deposit of £2 2s. (cheque). Tenders by noon on May 10, to James Mansergh and Sons, 5, Victoria Street, Westminster, S.W.

May 17. DUNDEE.—Supply of 250 3in., 1,000 4in., and 600 6in. cast-iron pipes, for the Dundee Water Commissioners. Specification and form of tender of George Baxter, engineer and manager, water engineer's office, 93, Commercial Street, Dundee. Offers, marked "Tender for Pipes," with Wm. H. Blyth Martin, town clerk, City Chambers, Dundee, by May 17.

PAINTING.

May 12. BARKING, ESSEX.—Painting the bridge carrying the light railway over Barking Creek, for the U.D.C. Specification and form of tender of H. L. Howard, electricity works, East Street, Barking. Tenders, endorsed "Tender for Painting Bridge," by 7 p.m. on May 12, to H. Hargreaves, clerk to the council, public offices, Barking, Essex. Fair wages clause.

May 18. BURY ST. EDMUNDS.—Painting, etc., at the following council schools:—Beyton, Brandon High Street, Haverhill, Nayland, Newmarket St. Mary, Stanton, Sudbury, Woolpit, for the West Suffolk Education Committee. Specifications and form of tender on application to the building inspector, A. Ainsworth Hunt, Shirehall, Bury St. Edmunds. Tenders, addressed to Fred. R. Hughes, sec. to the education committee, Shire Hall, Bury St. Edmunds, are to be delivered at the county education offices, endorsed with the name of the school, by May 18 in respect of Beyton, Haverhill, Sudbury, and Woolpit Schools, and by June 15 for Brandon High Street, Nayland, Newmarket St. Mary, and Stanton Schools.

May 20. DUBLIN.—Painting, glazing, and window-cleaning works and supplies, for the Commissioners of Public Works, Ireland, at several buildings in Dublin and its vicinity. Forms of tender and schedules of supplies, on deposit of £1. Tenders, endorsed "Tender for Painting, Glazing, etc., Works and Supplies," by 10 a.m. on May 20, to H. Williams, secretary, Office of Public Works, Dublin.

PLUMBING & SANITARY

May 10. ABERDEEN.—Construction of Girderless outfall scheme, section No. 4, Northern District intercepting sewer: links to Victoria Bridge, for the Town Council. Drawings and specifications, etc., from W. Dyack, M.Inst.C.E., burgh surveyor, Town House, Aberdeen, on deposit of £5.

May 11. ELY, CAMBS.—Laying about 213 yards of 9in. sewer, and 186 yards of 10in. sewer, with manholes, caveholes, and catch pit, at Wilburton, for the R.D.C. Plans and specification of E. B. Claxton, clerk to the R.D.C., Egremont Street, Ely, to whom tenders are to be sent by May 11.

May 11. RADLETT.—Laying about 140 yards lineal of nine-inch surface water drain, in Aldenham Avenue, Radlett, together with one manhole, and four gullies, for the Watford R.D.C. Plans and specification and quantities at the offices of the surveyor to the council, Ernest Lailey, 9, Market Street, Watford, on deposit of £1 1s. Tenders, endorsed "Tender for Surface Water Drain, Radlett," by 4 p.m. on May 11th, to H. Morten Turner, clerk to the council, Watford Place, Watford.

May 11. GUISBOROUGH NORTHGATE.—Alterations and improvements to the conveniences at Guisborough Northgate Council School, for North Riding of Yorkshire C.C. Forms of tender and plan and specification at the school. Tenders by noon on May 11, endorsed "Tender, Guisborough Northgate," to J. C. Wrigley, secretary, County Hall, Northallerton.

May 13. SALFORD.—Drain work at the workhouse, for the guardians. Particulars and specification from Henry Lord, F.R.I.B.A., 42, Deansgate, Manchester. Tenders, endorsed "Drains," to F. Townson, clerk, union offices, New Road, Salford, by May 13.

May 20. DUBLIN.—Plumbing and gasfitting works and supplies and ironmongery supplies, for Commissioners of Public Works, Ireland, at several buildings in Dublin and its vicinity. Forms of tender and schedules of supplies on deposit of £1. Tenders endorsed "Tender for Plumbing, Gasfitting, etc., Works and Supplies, by 10 a.m. on May 20, to H. Williams, secretary, Office of Public Works, Dublin.

June 8. MANCHESTER.—Laying and jointing the northern section of the third line of pipes from Thirlmere to Manchester, for the Corporation. Plans and drawings and printed specification, schedule of quantities, and form of tender (except during Whit week) at the offices of G. H. Hill and Sons, civil engineers, Albert Chambers, Albert Square, Manchester, and 3, Victoria Street, Westminster, on deposit of £5 5s. Tenders, endorsed "Thirlmere Aqueduct: Contract A: Tender for Laying, etc., Cast-iron Pipes," and addressed to the chairman of the waterworks Committee, must be forwarded to the secretary, waterworks offices, town hall, Manchester, by June 8.

ROADS AND CARTAGE.

May 10. LONDON.—Constructing a new road at Muswell Hill, N. Plans, sections, and details, and a copy of the specification, upon personal application to Vigers and Co., 4, Frederick's Place, Old Jewry, E.C. Tenders to be delivered to C. J. Hayter, 84, Temple Chambers, Temple Avenue, E.C., before noon on May 10. 5s. deposit.

May 10. PUTNEY.—Making-up and paving Landford Road, Putney, for the corporation of Wandsworth. Specification and drawings and forms of tender at the borough engineer's office, New Streets Department, 56, East Hill, Wandsworth, S.W. Tenders, endorsed "Tender for Paving Landford Road," must be delivered at the Council House, East Hill, Wandsworth, S.W., by 4 p.m. on May 10. Fair wages clause.

May 10. REIGATE.—Supplying granite macadam, granite kerb, Kent ragstone, tar paving, artificial stone paving, flints, gravel, concrete beach, Portland cement, for the corporation. Specifications and forms of tender of Fred. T. Clayton, borough surveyor, Municipal Buildings, Reigate, to whom samples of material are to be sent. Tenders, endorsed "Tender for Granite Macadam," or as the case may be, by May 10, to Alfred Smith, town clerk, Municipal Buildings, Reigate.

May 11. HARWICH.—Supplying from 2,500 to 3,000 tons of granite, broken to go through a 1½in. ring, and delivered at Harwich, Wivenhoe, and Mistley; also supplying red Kent flints, broken to a 2in. gauge, and delivered to Beaumont 600 cub. yds., Harwich 500 cub. yds., Clacton 200 cub. yds., Kirby 300 cub. yds., St. Osyth 300 cub. yds., Great Oakley 200 cub. yds., Mistley 400 cub. yds., Landermere 300 cub. yds., The Flag 200 cub. yds., all for the Tendring R.D.C. Tenders and samples by May 11, to A. J. H. Ward, clerk to the council, workhouse, Tendring, Weeley, R.S.O.

May 12. ST. NEOTS.—Supplying about 500 tons broken granite, and from 250 to 500 tons of ironstone slag and 100 tons of tar macadam, for the U.D.C. Particulars and forms of tender of John Edey, surveyor, South Street, St. Neots, Hunts, to whom tenders, accompanied by samples, are to be sent by 4 p.m. on May 12.

May 12. ENFIELD.—Making up Burleigh Road (part of), Enfield, for the U.D.C. Plans and specificatins, form of tender, and all information on application to Richard Collins, council's surveyor, at the public offices. Tenders by noon on May 12, endorsed "Tender for Burleigh Road," to T. W. Scott, clerk to the council, public offices, Enfield, Middlesex.

May 11. BOOTLE.—Execution of private street works, for the corporation. Plans, etc., at the borough engineer's office. Tenders, endorsed "Tender for Private Street Works," by noon on May 11, to J. Henry Farmer, town clerk, town clerk's office.

May 11. SOUTHAMPTON.—Supply and delivery of (1) broken granite, (2) broken flints, (3) Caithness paving, for the C.C. Specifications and conditions, with forms of tenders, of J. A. Crowther, borough engineer. Tenders before 2 p.m. on May 11, to R. R. Linthorne, town clerk, Municipal Offices, Southampton.

May 11. FAVERSHAM.—Supply and delivery of 430 tons of best Guernsey granite, broken to a 2-in. gauge and well screened, to be delivered as under:—Alongside Conyer Wharf, Teynham, 220 tons; in trucks at Selling Station, S.E. and C.R., 210 tons, for the R.D.C. Form of tender and further particulars on application to the district surveyor, J. G. Chittenden, Ashford Road, Faversham. Tenders, endorsed "Tender for Granite," to be delivered by May 11, to Allan Tassell, clerk, council offices, Faversham. Samples to be sent to the surveyor by May 8.

May 12. TWICKENHAM.—Forming, levelling, kerbing, channelling, paving, metalling, and making good: 1, Bonser Road; 2, Holmes Road, for the U.D.C. Plans and specifications, and bills of quantities and forms of tender of Fred W. Pearce, F.S.I., surveyor to the council, town hall, Twickenham, and on deposit of £1 1s. with H. Jason Saunders, clerk to the council, town hall, Twickenham, to whom tenders, endorsed with the name of the street, and marked "Tender for Street Improvement Works," are to be sent by noon on May 12.

May 13. GOSPORT and ALVERSTOKE.—Paving part of North Street, in continuation of the granited asphalte; also paving footways of Anglesey and Foster Roads with Granolithic paving slabs, for the U.D.C. Specifications at the surveyor's office, town hall, Gosport, on deposit of £1 1s. Tenders, endorsed "Tender for Paving," to be delivered at the clerk's office, town hall, Gosport, by noon on May 13. Fair wages clause.

May 15. BRUMBY AND FRODINGHAM.—Supplying about 400 tons of whinstone, to be delivered at Gunness and Frodingham Stations, G.C.R., for the U.D.C. Specifications and forms of tender of Joe Green, surveyor, council offices, New Frodingham, Doncaster, to whom tenders, endorsed "Tender for Whinstone," must be sent by May 15.

May 15. HOYLAND, near BARNSLEY.—Supply and delivery of the following road materials for the year ending March 31, 1910, for the U.D.C.:—Broken slag, granite, tar macadam. Full particulars and form of tender of Frank Hewitt, engineer and surveyor, town hall, Hoyland, near Barnsley, to whom tenders (accompanied by sample), endorsed "Tender for Materials," are to be sent by May 15.

May 26. WOOD GREEN.—Making-up (1) Dukes Avenue (from the Parish Boundary to Grove Avenue), and (2) Wellesley Road, for the U.D.C. Plans, sections, and specifications, and bills of quantities, on application to the surveyor, town hall, Wood Green, upon deposit of £1 1s. with Wm. P. Harding, clerk to the council, town hall, Wood Green, to whom tenders are to be sent by 5 p.m. on May 26. Fair wages clause.

MISCELLANEOUS.

May 11. FAVERSHAM. — Supplying (at per gallon), 3,280 gallons more or less) of specially prepared extra thick double distilled tar, similar to sample, which can be seen at the office of the district surveyor, for the R.D.C. Further particulars on application to the district surveyor, J. G. Chittenden, Ashford Road, Preston, Faversham. Tenders, endorsed "Tender for Tar" (no form provided), to be delivered by May 11, to Allan Tassell, clerk, 19, West Street, Faversham.

May 11. RICHMOND, Surrey. — Supplying for the main sewerage board, during the year ending May 31, 1910:—1, steam coal (Welsh); 2, house coal; 3, Buxton lime; 4, grey lime; 5, sulphate of alumina and green copperas; 6, filter cloth. Specifications, forms of tender, and further particulars on personal application at the office of the engineer to the board, West Hall Road, Kew Gardens, S.W. Tenders by May 11, to J. Leslie G. Powell, clerk to the board, The Sessions House, Richmond, Surrey.

May 12. LONDON.—Supply, delivery, and, where necessary, fixing of carpets, rugs, tables, desks, bookcases, chairs, glasses, fenders, electric light fittings, etc., for rooms in the town hall, extension, for the corporation of Chelsea. Drawings, conditions, specication, schedule, and form of tender by the borough surveyor, and printed copies of which (except the drawings), with information, may be obtained from him at the town hall. Tenders by 5.15 p.m. on May 12, to T. Holland, town clerk, town hall, King's Road, S.W.

May 17. DUNDEE.—Supplying 12 tons or thereby of bar lead and lead pipe, for the Water Commissioners. Schedules, offers marked "Tender for Lead," with Wm. H. Blyth Martin, town clerk, City Chambers, Dundee, by May 17. George Baxter, engineer and manager, water engineer's office, 93, Commercial Street, Dundee.

May 17. DUBLIN.—Supply of 20,000 to 25,000 10in. by 10in. sleeper blocks, for the Great Northern Railway Company (Ireland). Specification and form of tender from the secretary on payment of 1s. (not returnable). Tenders, endorsed "Tender for Sleeper Blocks," by 10 a.m. on May 17, to T. Morrison, secretary, Amiens Street Terminus, Dublin.

May 17. MANCHESTER.—Supplying (a) Portland cement (150 tons), (b) granite setts (700 tons), (c) Stoneware pipes (1,450 yards, 18in. to 24in. dia.), stoneware drain covers (7,000), stoneware under-drainage tiles (30,000 lineal yards); (d) valves, sluice gates, etc.; (e) cast-iron pipes, rings, and gratings, for the corporation. Specifications and forms of tender to the secretary, Rivers department, town hall, where tenders must be delivered by 10 a.m. on May 17.

May 19. WALLASEY.—Supplying until March 31, 1910:—1, macadam; 2, granite chippings; 3, limestone chippings; 4, concrete flags; 5, Portland cement; 6, kerbs and channels; 7, lime; 8, drain and sewer pipes; 9, street and passage gullies; 10, wrought and C.I. materials (manholes covers, street nameplates, etc).; 11, bolts, nuts, files, etc.; 12, lead and iron pipe, fittings, etc.; 13, brushes, buckets, shovels, etc.; 14, timber; 15, paints, oils, white and red lead, etc.; 16, pitch, tar and creosote oil; 17, provender, etc., for the U.D.C. Particulars, specification, and tender forms of W. H. Travers, A.M.I.C.E., district engineer and surveyor, public offices, Egremont, Cheshire. Tenders, endorsed "Tender for Stores, Works Committee," by May 19, to H. W. Cook, clerk and solicitor, public offices, Egremont, Cheshire.

Appointments Wanted.

The charge for Advertisements under this heading 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ACADEMY (Royal) exhibitor prepares perspectives on moderate terms; specimens sent; also designs, plans from rough sketches, drawings, tracings, competition work, etc.—Box 4983, BUILDERS' JOURNAL Office.

ADVERTISER (28), seeks position of trust in a business; 10 years with large London builders; good references; security would be given, if required.—Address, E.G., 6, The Avenue, Brondesbury, N.W. 5012

ADVERTISER, with six years' practical experience and a knowledge of bookkeeping and office routine, desires situation in builder's or estate agent's office.—C. J. Mounter, 24, Hillfield Road, West Hampstead, N.W. 5028

AN experienced young architect, with small connection, desires position or work at own office; prolific designer and rapid draughtsman; specifications, etc.—"C.," 24, Hainthorpe Road, West Norwood, S.E.

APPOINTMENT as Improver (19), just completed three years' articles with architect; good draughtsman, tracer, etc.; excellent testimonials; moderate salary.—J.S.C., 10, Almeric Road, Clapham Common. 4993

ARCHITECT'S Assistant desires re-engagement in a good London office; eight years' experience; good references; experience in competition work.—B. E. Atkinson, jun., 14, Rosslyn Hill, Hampstead, N.W. 5018

ARCHITECT'S Assistant (27), good draughtsman and colourist; contract drawings, designs, details, perspectives, surveys; travelling studentship winner, specimens.—H. C. S., 65, Grove Road, Norwich 5025

ARCHITECT'S Assistant desires engagement, finalist, R.I.B.A.; design, details, specifications; first-class honours, quantity surveying, honours (Part I.), building construction, artistic and practical; moderate salary.—Address, Architect, 24, Brunswick Street, C.-on-M., Manchester. 4984

ARCHITECT'S Assistant (24), disengaged; Inter. R.I.B.A., 6½ years' varied experience, town and country; working drawings, details, and perspectives; levelling, reinforced concrete details; assist with quantities.—Riches, 35, Culverden Road, Balham, S.W. 5013

ARCHITECT'S Assistant (23), 6½ years' experience; excellent draughtsman, working drawings, details, specifications, surveying; assist with quantities; first-class references.—H.B., 23, Springfield Road, Bury St. Edmunds. 5001

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill, S.W. 4992

ARCHITECT'S Assistant (23), excellent draughtsman, desires re-engagement; six years' first-class experience; contract, detail and competition drawings, specifications, perspectives (exhibitor at Royal Academy); prizeman for architectural design; highest references; moderate terms.—F.E.T., 10, Cobham Road, Kingston-on-Thames. 5015

ARCHITECT, 32, qualified, seeks any position where his services would be available; energetic; disengaged; mod. salary.—Box 5006, BUILDERS' JOURNAL Office.

BUILDERS' and Contractors' Assistant desires situation, knowledge of plans, specifications, quantities, wages and general office routine; age 21; 4½ years' experience; salary moderate; good timekeeper.—Box 4994, BUILDERS' JOURNAL Office.

BUILDER'S Assistant (20), desires situation; knowledge of plans, prime cost, general routine; 4½ years' experience.—Box 5030, BUILDERS' JOURNAL Office.

CARPENTER, and French polisher wants situation, young, capable workman, good refs.; moderate wage.—C.P., 21, Redstone Road, Redhill, Surrey. 4989

CLERK of Works, disengaged; experienced in building and engineering works; home or abroad; fluent French, translations.—Address, Tett, 78, Durban Road, Beckenham, Kent. 4988

DRAUGHTSMAN (26), home or abroad, neat, quick tracer and colourist, working drawings from rough sketches, bookkeeping and general office routine; foreign experience.—H.W., 64, Crofton Road, Camberwell, S.E. 5003

ENGINEER, 29, disengaged; exp. in designs, detail, drawings, calculations, quantities, structural steelwork, fireproofing, reinforced concrete, bridges, buildings.—Box No. 4991, BUILDERS' JOURNAL Office.

ENGINEER, mechanic, desiring change, requires permanent situation on staff, official or private; thorough all-round general experience; married.—J.G., 86, Bathurst Gardens, Willesden, N.W. 5011

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W. 4951

JUNIOR (20), 4 years' experience, good draughtsman, quick and accurate leveller and surveyor, building, sewerage, water supply, abstracting, billing quantities, typewriting, shorthand; salary no object.—S.F.H., 16, Dodington, Whitchurch, Salop. 5032

JUNIOR Assistant, disengaged; good knowledge of domestic architecture.—Reply, J. R. F., 248, Sandycombe Road, Kew Gardens, S.W. 5031

MASONRY, manager or foreman, machinery and all details, all classes of masonry work; London and country experience; terms moderate.—G.B., 38, Napier Road, Tottenham, London. 4975

SHOP-FITTING, or high-class joinery, advertiser (38), seeks situation as foreman in shop-fitting or high-class joinery works; can take full control; 9 years' references; abstainer.—Box No. 5007, BUILDERS' JOURNAL Office.

YOUTH wants situation, surveyor's or builder's office; four years' experience; working up quantities, measuring up, good draughtsman; scholarship holder; excellent testimonial.—J. R. O., 233, Essex Road, N. 5017

Appointments Vacant.

NORTHAMPTONSHIRE COUNTY COUNCIL EDUCATION COMMITTEE.

An Assistant will shortly be appointed in the Education Surveyor's Department. He must be a good draughtsman, and accustomed to inspect and report on work in progress. Experience in an architect's or a Surveyor's office is essential.

The salary offered is £120, rising by £5 increments to £150 per annum.

Forms of application may be obtained from the undersigned, and must be returned not later than Saturday, May 8, 1909.

J. L. HOLLAND,
Secretary of Education.
County Education Offices,
Northampton. 4998

WANTED immediately, a temporary fully qualified competent and expeditious quantity surveyor, able to take out a complete and correct bill of quantities (London system), and to write specification; one with experience in school work preferred; state salary expected.—Apply, stating full particulars of age, experience and qualifications, and enclose copies of three recent testimonials, to D. Pugh-Jones, F.S.I., County (School) Architect, 62, Charles Street, Cardiff. 5023

THE GUILD OF ARCHITECTS' ASSISTANTS.

A Guild of the profession formed to promote and maintain the interests of Assistants.

The Committee desire to receive the names of all interested in the proposals of the Guild, and any expressions of opinion thereon. All information required will be given by the Secretary, 60, Idmiston Road, Stratford, E. 4985

This form should be cut out and sent with remittance to: The Manager, "THE BUILDERS' JOURNAL," Caxton House, Westminster.

"THE BUILDERS' JOURNAL"

PREPAID ADVERTISEMENT FORM.

PLEASE WRITE CLEARLY.

Advertisements must reach Caxton House not later than 5 o'clock Monday.

4 LINES (about 28 words)

28 WORDS.

An advertisement costing 1/6 can be inserted 3 times for 3/- (the price of 2 insertions.)

6d. extra for every additional line about words.

The price quoted on this Form applies only to "Situations Wanted" For other Rates see page vi.

Box numbers will be allotted to advertisers free of charge, and replies addressed to a Box Number can be forwarded to the advertiser per post upon request. Postage of such parcels will be charged, but rolls or parcels of drawings in reply to advertisements are not accepted.

Advertisements are accepted for 3 insertions for the price of two, and six announcements are given free in the Employment Register to advertisers seeking situations who order three insertions of their advertisement (see "Employment Register").

May 12, 1909. Volume 29. No. 744.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders:—R.I.B.A.—Report of the Council, 451; A Sympathetic Bequest, 451; Suggested Indian Museum, 451; St. Clement Danes - - - - - - - 452
Architectural Furniture - - - - - 452
Decorative Ironwork: Its Rise and Progress 452
In Parliament - - - - - - - 453
Notes on Competitions - - - - - - 454
Our Plate - - - - - - - - 454
R.I.B.A. - - - - - - - - 454
Correspondence - - - - - - - 454
Enquiries Answered - - - - - - 454
Japanese Garden Architecture - - - - 457
Views and Reviews - - - - - - 458
The Specification and Inspection of Timber. By J. Davies - - - - - - - 459
R.I.B.A. Examinations - - - - - - 463
Federation News - - - - - - - 469
Trade and Craft - - - - - - - 470
Insurance - - - - - - - - 470
Tenders - - - - - - - - -vi., viii.
Complete List of Contracts Open xxiii., xxiv., xxvii.

FIRE RESISTING CONSTRUCTION SECTION.

An Inexpensive Fire-resisting Hospital - - 461
Reinforced Concrete: Design, Quantities and Practice. By Moritz Kahn - - - - 461
Tests at the Kleine Exhibit, Olympia - - 464
Fireproofing the Dwelling - - - - - 464
British Uralite Co.'s Fire-resisting Products - 468

ILLUSTRATIONS.

Centre Plate. — Rebuilding of Netherswell Manor, Gloucestershire. E. Guy Dawber, architect.
Lincoln Cathedral, from the Canal. From the Water-Colour by A. C. Payne - - - 453
Enquiries Answered: Diagrams illustrating replies to Yorks.—"H.," and Burnham—W.J.P., 455; diagrams illustrating replies to Tring—"A Constant Reader," and Berwick-on-Tweed — "H.E.S." - - - - 456
Japanese Garden Architecture: Design for Pergola, adapted from the Japanese Torii, 457; Summer House, with trellis shutters, erected after a Japanese model at Ockley House, Beds. - - - - - - - 458
The King Edward VII. Hospital, Windsor. A. William West, architect. General View, 461; view of big ward block, 462; plans, 462, 463; view from the rear, 464; interior first-floor ward - - - - - - - 464
Fireproofing the Dwelling: Fire-resisting house, Cedarhurst, Long Island, U.S.A., Louis Boynton, architect. View and plans, 465. Fire-resisting house, Bogota, New Jersey, U.S.A., Squires and Waynkoop, architects: Views and plans, 466. Fire-resisting house (No. 2), Cedarhurst, Long Island, Louis Boynton, architect: View and plans - - 467
British Uralite Co.'s fire-resisting products: Warehouse and ordinary types of Uralite fire-resisting doors, 468. Balloon shed at the Army Balloon Factory, Aldershot - 468

R.I.B.A,—Report of the Council.

The report of the Council for the official year 1908-1909 was submitted at the annual general meeting of the R.I.B.A., held on Monday, May 3rd, at 9, Conduit Street. Notwithstanding the rather lengthy list of losses by death, among which we regret especially to observe the names of several well-known architects, who have rendered good service to the Institute, there has been a satisfactory increase in the membership of the R.I.B.A., which now stands at 2,278, as against 2,239 at the corresponding period of last year—to be precise, since the annual general meeting in 1908, nine Fellows eighty-two Associates, and one Hon. Associate have been elected. The Council, as we duly recorded some months ago, has decided to award the Royal Gold Medal to Dr. Arthur John Evans, in recognition of the distinguished services he has rendered to the history of architecture by his explorations in Crete, and we now offer our congratulations to the Council on the wise discrimination it has shown in thus conferring a well-deserved honour upon a very eminent savant. We regret to find that the policy of the Board of Examiners still tends to the wholesale admission of students to a profession which, as is painfully apparent, is already overcrowded to a dangerous extent. The tabulated results of the progressive examinations held during the past year are as follows:—

	Admitted.	Exempted.	Examined.	Passed.	Relegated.
Preliminary ..	335	68	267	198	69
Intermediate..	338	10	328	155	173
Final & Special	237	—	237	79	581

The total number of candidates was thus 910. The number of probationers now stands at 2,923, and of students at 961. The time is surely ripe for exacting a far more rigorous test of suitability from those desirous of entering the ranks of the profession; yet, as we have seen from the published results of the examinations held during the past year, of 335 candidates for the preliminary examination 68 were exempted, 267 examined, 198 passed, and only 69 relegated to their studies. Over and over again, in the pages of this journal, we have pointed out the absolute impossibility of ascertaining a candidate's suitability for a calling—which, beyond all others, requires qualifications of a very diverse nature—by means of any so-called test framed in the form of an elementary examination, which any public schoolboy of from 12 to 15 years of age might reasonably be expected to pass. Frankly, we think that the policy of the Council in thus enabling imperfectly equipped candidates to enter the ranks of a profession in which many very able and accomplished men are unable to earn more than a bare livelihood is detrimental alike to the welfare of the student and of the profession. It deludes many hard-working students into the belief that by their success in passing the requisite examinations they assuredly possess the requisite qualifications for future success in their chosen profession, and, in addition, it stultifies the work of many ardent reformers of to-day who are seeking to close the door of the profession to unsuitable aspirants. What is the good of closing the door of the profession to the undesirable practitioner, and throwing it open to its fullest extent to the unsuitable student? The vacancy caused by the resignation by Mr. Alexander Graham of the office of hon. secretary, after many years of arduous and distinguished service, is one of a kind that it will be extremely difficult adequately and satisfactorily to fill. Indeed, the very nature of the appointment requires qualifications of a literary and personal character with which very few architects are endowed, and it will be extremely difficult to find a worthy successor to Mr. Graham.

A Sympathetic Bequest.

Just to miss the *Prix de Rome*, or any other coveted distinction or reward, is probably a more bitter experience than that of being hopelessly beaten in the competition. *Væ victis!* is a cry that should have died out with the pagans. The more modern note of sympathy with the defeated has been sounded by a lady. At a recent meeting of the Architectural section of the Académie des Beaux-Arts, it was announced that Mlle. de Badiola has bequeathed the sum of a hundred thousand francs for investment as a capital sum, the interest on which is to be available for those young architects who, having competed for the *Prix de Rome* and obtained only the second prize, are debarred by the age limit from competing again. One would like to know the psychological history of that bequest. So much of grace and tenderness suggests the underlying romance of some dear defeat. But the consolation prize is always of practical rather than sentimental value. Defeated candidates for the *Prix de Rome* or for any other prize, have always the consolation that superior success does not invariably turn on superior merit, but may depend on many accidents of the moment or of the situation. The philosophical view, however, seldom presents itself to the disappointed competitor, whose dejection is not alleviated by the knowledge that, besides fame, he has missed substantial advantages that might mean for him the difference between success and failure in his profession. The gracious memory of Mlle. de Badiola will be gratefully cherished by many an aspiring young French architect.

Suggested Indian Museum.

A somewhat neglected aspect of the housing question was the subject of a deputation that waited on Mr. Runciman at the Board of Education on Thursday last. Lord Curzon of Kedleston, who was the leading spokesman, said that the object of the deputation was "to invite a reconsideration by the Government of their alleged intention to distribute what was popularly known as the Indian Collection at South Kensington." The collection had its origin and nucleus in the objects that had been brought together in the old East India House in Leadenhall Street, and these treasures, which had been in various ways augmented, were now accommodated in two long galleries erected for pictures, and "profoundly unsuited" for the present purpose. The deputation was inclined to ask that the collection should not be scattered, but should be housed in the new Victoria and Albert Museum. But there the accommodation was limited, and would be inadequate to the possible and desirable extension of the collection. "Do not these facts, therefore," Lord Curzon asked, with delightful modesty—he was anxious not to frighten Mr. Runciman at a time when there are so many demands on the Government—"point to a larger solution?" Passing swiftly from the interrogative to the indicative mood, Lord Curzon said that "the first thing required would be a plot of land," and "then they should put on it a building worthy of the Indian Collection." Following this graduated method of "breaking it gently," one might be allowed to bridge the yawning hiatus between the site and the building by suggesting that it would be desirable to appoint assessors and select an architect, and that in this connection a useful address is

9, Conduit Street, Hanover Square, W. Mr. Runciman was even more cautious. The difficulty was, he said, that they had no available site, and no building in which to house a great collection of that kind; but he would bring the matter under the notice of his colleagues. No doubt he will break it to them very gently, and they will make a good recovery from the shock on perceiving how much easier it is to avoid building new museums than to postpone the construction of "Dreadnoughts." This allusion is innocent of all political significance; its import being that the deputation was somewhat unlucky to catch the Government in an inauspicious mood for building anything but ships of the sea and of the air. We strongly sympathise with the proposal, and do not utterly despair of its ultimate realisation.

St. Clement Danes. One of the five new memorial windows recently unveiled by Princess Henry of Battenberg in the church of St. Clement Danes, in the Strand, commemorates Dr. Johnson, who was a worshipper in the church, and whose favourite seat is indicated by a tablet. It shows him, as the inscription relates, "surrounded by his literary friends, Goldsmith, Garrick, Burke, Boswell, and Mrs. Elizabeth Carter," who bears in her hand a volume labelled "Plato." The literary associations of the church extend much further back than the days of the "Great Cham of Literature," for here were buried Otway and Lee the dramatists, and Rymer the author of the "Fœdera." Its architectural interest is rather curious. It escaped the Great Fire, but the body of the old church was rebuilt in 1682, by Edward Pierce, under the supervision of Wren, who is commemorated in a tablet in the church as "His Majesty's Surveyor, freely and generously bestowing his great care and skill towards the contriving and building of the church." The present tower and steeple were added by Gibbs, in 1719. The old tower was low and "practicable," serving sometimes, during the Middle Ages, as a beacon with a blazing torch to guide the shipping on the Thames, and later it was mounted with a piece of ordnance that was intended "to quell the contumacious prelates and nobles who resided in and about Essex Street," and served also "as a prevention against the pirates who attacked and plundered those who frequented the river." It must have frightened more than it hurt—if it ever existed. At any rate, the legend is interesting, and is a quite characteristic reminiscence of the times when a church was half fane, half fortress, and the tower was its keep.

Mr. Carnegie has approved the plans for the Blackpool Library, towards the cost of which he is giving £15,000.

* * *

Messrs. Siemens Brothers and Co., Ltd., intimate that they have removed their offices from 12, Queen Anne's Gate and Queen Anne's Chambers, to Caxton House, Westminster, S.W.

* * *

The binding department of the Oxford University Press in Aldersgate, London, E.C., was destroyed by fire on Friday morning last, the damage done being estimated at £30,000. A fire at a timber yard at Plymouth, on Saturday last, did damage estimated at £60,000. Pieces of burning wood were blown into the ventilators of the Council schools separated by two rows of houses from the fire, and the girls' and infants' departments were completely destroyed.

ARCHITECTURAL FURNITURE

Mr. Charles Spooner, F.R.I.B.A., lecturing at the Carpenters' Hall, London Wall, E.C., remarked that the making of furniture is one of the finest of the crafts, and one of those which help to make up the art of architecture. The first things to be thought of in the making of furniture are utility, good construction, and the nature of the material to be used. Designers are too often mere draughtsmen, who make sketches of furniture in this or that style. These are handed on to the manager or foreman, to make working drawings and interpret the sketch in the best way he can. The draughtsman is too often shut up in an office, and never comes into touch with the material or with the craftsmen.

Turning to the work itself, the lecturer said that the first thing to think of was utility. Furniture, he said, was wanted, not as an ornament, but for a definite purpose, and the better it serves its purpose the more satisfactory it is. This is a consideration which is not always borne in mind by makers of furniture. For instance, a heavy piece of furniture is apt to secrete dust, and should either stand on a plinth, or on legs, so that the dust can be removed easily. Then we must think of the nature of the material and of the construction. Furniture is generally made of hard wood. Strong furniture may, however, be made of soft wood, but the shapes should be large and soft. A chest designed by Mr. W. R. Lethaby was shown, which, the lecturer remarked, was an example of an appreciative use of oak. Some of the hard woods, he continued, are of such a hard and close texture that they can only be used as veneer. This is a perfectly legitimate use of wood, provided it is used quite frankly, and as decoration only. A good plan is to surround the veneer with solid wood, so that it cannot get chipped.

All hard woods are heavy, and the lecturer expressed the opinion that it would be well if all the big things like wardrobes, etc., were provided as fixtures when the house was built. As furniture has frequently to be moved, it is subject to much strain, and it is convenient to make it in parts, which are described by the furniture makers as "carcases." There are two ways of making carcases—one is to make them of posts, rails and stiles, the openings filled with panels. This is known as a framed carcase. The other is to use boards dovetailed at the angles. This may be called a dovetailed carcase. The back of a carcase, and especially a dovetailed carcase, wants bracing. The best way would be to put diagonal braces across the corners and fill in with paneling, but this would be too expensive. The only way, therefore, is to have wide horizontal rails tenoned or dovetailed into the upright ends, and the wider the rails the stiffer the carcase.

There are certain qualities which are essential. One of these is fitness. For a thing to be satisfactory in appearance, it must not only be fit for the material of which it is made, but must look so. Another essential is good proportion. There are, however, no rules for good proportion, and the only way to learn it is to study good examples; for instance, Sir Christopher Wren's works, notably St. Paul's Cathedral and St. Stephen's, Walbrook; also the Banqueting Hall, Whitehall, by Inigo Jones. An example of good proportion in furniture was shown, namely a Dutch cabinet of the 17th century, and other excellent examples of well-proportioned furniture were illustrated, including a toilet cabinet by Chippendale, a large round dining table to seat twelve people comfortably designed by the lecturer. There were also a fine sideboard of oak, 8 ft. long, a crib designed by Mr. R. S. Lorimer, with some charming figures beautifully cut in wood (and of which the lecturer remarked that they were the only examples he knew in which the spirit and character of the carving were equal to old work), and some other examples of furniture by the lecturer and Mr. W. R. Lethaby. While ornament (provided it is good) certainly adds to the beauty of furniture, it is necessarily expensive. The kind of wood as well as the character will determine the nature of the ornament. Carved ornament on furniture ought to be in low relief. The linen-fold panel seems a good treatment, and a great deal might be done with it. Some examples were shown treated in a way very unlike folds of linen, but with an excellent result. The lecturer expressed his fondness of tracery as decoration, and thought that much might be done with it. It should, however, be used in moderation, and together with foliage, leaves, etc.

Passing on, Mr. Spooner remarked that so far he had only considered isolated pieces of furniture; but it was important to think of them in everyday use among their surroundings. In this connection several examples of interiors were shown, including rooms from the homes of the late William Morris, and Sir Edward Burne-Jones, and the various points of interest were briefly enumerated. Until modern times, he said, there was no difference between the style and character of house and church furniture. The style was the living tradition of the time, and this lasted until the classic revival in the 15th and 16th centuries. With regard to church furniture, the altar was the first and most important thing in a church; indeed, one of the few essential things. It should be plain, and at all times, except on Good Friday and Holy Saturday (when it should be stripped and bare) covered with a frontal. In height it should never be less than 3 ft. 3 in., nor more than 3 ft. 6 in.—3 ft. 4½ in. is the best height. In width, never less than 2 ft. 3 in.—3 ft. is the best. As to length, anything less than 5 ft. would be inconvenient. The foot space of the step on which it stands should be at least 3 ft. wide. Every altar should have a cross and candlesticks, and at least one frontal.

The largest piece of church furniture is the rood screen, or chancel screen, as it is sometimes called (and rightly when it does not bear a rood). In some of the Somerset and Devon churches this ran right across the church below the nave arcade arches, and so formed a chancel. A large crucifix was fixed on the centre of the screen, with figures of the Blessed Virgin Mary and St. John on either side, the whole being ornamented with colour and gold. Some splendid examples of screens in Devonshire, Lincolnshire, Wales, etc., were shown, and also two from Norfolk, with painted panels. The seats for the clergy should, he said, be fixed to the east side of the screen, and those for the choir returned to face north and south. Concluding, the lecturer said that if a man understands good design, is a master of proportion, and thoroughly understands his material, he will have no difficulty in working in any style.

DECORATIVE IRONWORK: ITS RISE AND PROGRESS.

The last of the series of lectures organised by the Carpenters' Company with the object of stimulating the spirit of craftsmanship, was delivered by Mr. Starkie Gardner. Although woodworking and metal working are sister crafts, yet there has always been a measure of antagonism between the two. In the struggle for existence the smith has encroached on the carpenter's field. He regards wood as merely something on which to fix his iron, or with which to light his fires. He would rather use doors and strong boxes of iron and no wood at all. Screens and gates, etc., originally made of wood, are made of steel, but, as time goes on, roofs, rafters, bridges, railway stations, etc., and then the entire construction of permanent buildings of iron and concrete, preclude the use of wood at all.

In mediæval days, metal working was the recreation of kings, and no other material, with the exception of ivory, was so richly worked. In those days iron was produced in small blooms, weighing only a few hundredweights, and from these the smith cut ff pieces, and while they were hot beat nd hammered them out into the required hape, and then welded them together. In he days of Edward I., stamps and dies 'ere first introduced, which could be pressed n to the hot iron, as a seal is on wax. 'lowers and leaves, etc., in relief were unk into the ends of steel punches, and hese were impressed on the iron while it 'as hot and plastic, by blows of the hamner. The effect produced was that of a ich moulding in relief.

About a century later, the vertical iron alisading, i.e., railing, came into use. This ame about through the fact that Edward I. atronised not only smith-craft, but other etal crafts as well. There are some splenid effigies of his father Henry III. and ueen Eleanor at Westminster. These ombs needed protection, and so we find e tomb of the Black Prince surrounded y vertical bars, and with six massive stanards to give strength and dignity. Soon fter this the vertical bars were sharpened ito points at their upper extremities, and ius became the prototypes of our area and arden railings. Until the reign of Queen nne the carpenter held a monopoly in reens, rails, pulpits, etc. At this time the adition of smith-craft was completely forotten, and when a door or screen was anted in iron, the smith not only carried ut the design from the 'joiner's work, but so mortised and tenoned the pieces into e another.

Edward IV. intended to have a metal onument to his memory, but no smith in ngland was capable of making it, so the order was placed abroad. It is now at Windsor, and is the most wonderful specimen of iron joinery in Europe. Both Wolsey and Henry VII. desired to eclipse all their predecessors in the magnificence of their monuments; but when Henry himself died, after despoiling Wolsey, no one cared to put up a monument to his memory. No revival of ironwork came with the introduction of Renaissance architecture into England. Nor did the introduction of Palladian architecture by Inigo Jones improve matters, for he never designed or used decorative ironwork. Then, again, the ironwork associated with the work of Wren under the Stuarts was of the plainest description. No real revival took place until the accession of William and Mary, and then it was entirely due to the influence of one man, Jean Tijou, who was a magnificent designer and craftsman. His work can be recognised with certainty by the elaborate book of designs which he produced, and also by the building accounts of Hampton Court and St. Paul's. The lecturer briefly reviewed the life of Jean Tijou, who carried out the superb screen for the fountain garden at Hampton Court, and also the three rich and still preserved gates filling the archways on the east front of the palace. The novelty of Tijou's work consists in the use of embossed leaves, masks, crowns, etc., which are in great profusion. No such work or such rich effects had ever been seen in England before. His book of designs makes it clear that he was not a practical smith, but he was a most skilled and artistic embosser. When Tijou was at his zenith, he must have needed many assistants, and the lecturer enumerated a few whom he had been able to trace. One of these in 1707 set up a forge at Derby, and for many years carried on a large trade there and in the surrounding counties. Two brothers set up in Chester and executed all the fine work to be seen in that and adjacent counties. Another was working in Bristol in 1710. The work of all is distinctive and similar, making a lavish use of acanthus leaves and rosettes. There was also contemporary with these men a smith named Thomas Robinson, who had works at Hyde Park Corner. He is first heard of as a competitor with Tijou for the work at St. Paul's. In 1711 he produced the fine screen and gates at New College, Oxford, also work at Carshalton and other places, and the gates now at Devonshire House. His gates are of different proportion from those of Tijou's school, being more lofty and transparent. He was essentially a smith with a fine sense of proportion. During the time of Tijou, and while Wren lived, the design of the work, as well as the production, was considered essentially the smith's work. The English treatment of Robinson and his school was developing rapidly when Gibbs, in his book of architecture (1727), claimed the designing of ironwork to be within the architect's domain. The gates and window grilles to the Radcliffe Library, Oxford, the screen at the Horse Guards, and grilles at the Mansion House and the Bank of England, are examples of architects' designs in ironwork. Little by little the craftsman was left out, until finally the brothers Adam designed the whole of the parts of their buildings. Had the men who succeeded them been as capable, all would have been well, but it seems that the collapse of all art in this country in Early Victorian days must be traced to the suppression of the craftsman. It must be conceded that no one is more qualified to design in the applied arts than properly trained craftsmen.

LINCOLN CATHEDRAL FROM THE CANAL.
FROM THE WATER-COLOUR BY ARTHUR C. PAYNE.

In Parliament.

By our Gallery Representative.

Royal Scottish Museum Building.

In the House of Commons, Mr. Gulland and Mr. Munro Ferguson questioned the First Commissioner of Works on a subject which has several times cropped up in Parliament during the last few years, namely, the safety of the Royal Scottish Museum buildings in Edinburgh.

Mr. Harcourt stated that he had been long aware of the danger to the Museum from the neighbouring spirit stores, and he was glad to say that after prolonged negotiations he had within the last few weeks succeeded in purchasing the site. He could not, however, obtain complete possession until Whitsunday, 1910, but as soon as possible after that date the site would be cleared.

The Dublin Law Library.

Mr. Field asked the Secretary to the Treasury whether he could state the reason why the Board of Works (Ireland) did not advertise for tenders to heat and ventilate the Law Library, Dublin; whether he was aware that the specification precluded Irish firms from tendering for the ventilation portion of the contract; whether he was aware that the Sirocco Fan, patented by a Belfast firm, was acknowledged by experts to be most suitable for this class of building; and whether he could state if it was the practice of the Board of Works in Ireland to place contracts outside of Irish contractors without giving Irish contractors the opportunity of sending in tenders.

Mr. Hobhouse in a printed reply stated:—The first part of the question has already been answered by me in reply to questions put to me. The answer to the second and fourth parts of the question is in the negative. In answer to the third part of the question, I am informed that the Sirocco Fan is a good one, but the question of what is the most suitable fan for a particular building must naturally be determined by the special circumstances of each case.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
June 1	MOLESBY ISOLATION HOSPITAL. The East and West Molesey U.D. Council invite competitive plans, with specifications for the above. Full particulars can be seen at the Council Offices, Dundee Villa, East Molesey.
June 4	COTTAGE HOSPITAL, BODMIN. Architects are invited to submit competitive designs for the above, to be erected at an approximate cost of £2,000. Premiums, £12 12s., £8 8s., and £5 5s., for the three sets of plans *which the Committee may select*. Premiums of selected Architects to merge in Commission. Site can be seen on application to Henry D. Foster, Hon. Secretary to the East Cornwall Hospital, Bodmin, from whom particulars are to be obtained.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading, Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second, and third respectively.
July 9	STOKE-UPON-TRENT. Additions to Town Hall including large hall to seat 3,000 people, police court, etc. Premiums of £100 and £50 for second and third designs respectively. Assessor nominated by Pres. R.I.B.A. Conditions and particulars from Jno. B. Ashwell, Town Clerk, Town Hall, Stoke-on-Trent.
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	WALLASEY U.D. COUNCIL. CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

Middlesbrough New Library Competition.

On the recommendation of the President of the Royal Institute of British Architects, Mr. J. S. Gibson, vice-president R.I.B.A., has been appointed assessor in the above competition.

* * *

Elementary Schools, Wombridge.

The Education Committee of the Salop County Council have accepted the design submitted in connection with the above competition by Messrs. Dickens-Lewis and Haymes, architects, Shrewsbury.

Our Plate.

Netherswell Manor.

Netherswell Manor was built by Mr. E. Guy Dawber, F.R.I.B.A., five years ago, and was illustrated in "The Architectural Review." Mr. Dawber informs us that:—"Last year and this it has been rebuilt and enlarged to three times its original size; incorporating the old work with the new additions, which spread out in all directions, and it has been so altered that it is impossible to tell where the old work ends and the new begins. Consequently the plan is of no architectural interest, as it has awkward spots and corners, which one would not do if planning the whole place afresh." This very fact, however, adds to the personal charm and picturesqueness of the house, and Mr. Dawber considers it one of his best jobs. The building is now nearing completion, Messrs. Walker and Slater, of Derby, being the contractors. The drawing is now on view at the Royal Academy.

R.I.B.A.

The Royal Gold Medal.

Dr. Arthur Evans (Royal Gold Medallist elect) has intimated that it will be impossible for him to be in London at the time fixed for the presentation—viz., Monday, the 21st June. The Council have consequently resolved to abandon the general meeting arranged for that evening, and propose that the presentation shall take place at the opening meeting of next session, which will be the first Monday in November. The President is inviting members to an "At Home" at the Institute on the 21st June, and is arranging for the occasion an exhibition of water-colour drawings by architects.

The Annual Elections.

The following nominations have been made by members in accordance with by-law 30:—

As Vice-Presidents:—Alfred Wm. Stephens Cross, M.A.Cantab. (F.); Samuel Perkins Pick (F.), Vice-President 1905-6.

As Members of Council:—Hippolyte Jean Blanc, R.S.A., F.S.A.Scot. (F.); Arthur William Brewill (F.); Max Clarke (F.); T. Edwin Cooper (F.); Charles FitzRoy Doll (F.); H. P. Burke Downing (F.); Frederic Richard Farrow (F.); Arthur Rutherford Jemmett (F.); A. Marshall Mackenzie, LL.D., A.R.S.A. (F.); Charles Edward Mallows (F.); George Ernest Nield (F.); Paul Ogden (F.); Sydney Perks, F.S.A. (F.); Charles Henry Bourne Quennell (F.); Edward Robert Robson, F.S.A. (F.); Alfred Saxon Snell (F.); Lewis Solomon (F.); Percy Burnell Tubbs (F.); William Gilmour Wilson (F.); William Woodward (F.).

As Associate-Members of Council:—Kensington Gammell (A.); Alan Edward Munby, M.A.Cantab. (A.); Herbert Winkler Wills (A.); Arthur Needham Wilson (A.).

As Assoc. Member Literature Standing Committee:—Harry Inigo Triggs (A.).

As Members of the Practice Standing Committee:—Kensington Gammell (A.); Albert Walter Moore (F.).

As Member of the Science Standing Committee:—Ernest Alexander Young (A.).

Correspondence.

The Taxation of Land Values.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Your editorial in this week's issue proves that your paper is nothing if not up to date. We wish we could say the same for the special article on the above subject. We have a vast army of men employed (or who should be so) in the building trade. It is the second largest trade in the country, and in discussing the merits of "land" taxation the author has quite overlooked the effect of "building" taxation as at present applied. Buildings are taxed 50 per cent. *ad valorem.* If a client wants £1,000 worth of building it will cost him £1,500, because, when in possession and use, he will be assessed on his £1,000 at £60 annual and £50 rateable value, which with rates at 8s. in the £, means a first charge on the £1,000 of £20 per year, or £500 capitalised at 4 per cent. That is the reason why people build only when they must. If Mr. Horsburgh and other architects and builders once get that clearly in their minds they will not look askance at any body of politicians who propose to shift that tax on to something else. To builders this question is more than finding means for "Dreadnoughts" and old age pensions, it is more even than getting cheap land for building, and that is very desirable as we all know. It is going to mean, if carried to its logical conclusion, that people who own buildings will have the privilege of doing as they like with them, pulling down, beautifying, etc., etc., without being taxed for it.

MOORE AND CRABTREE.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Ellipse of Inertia.

CARDIFF.—"ELLIPSE" writes: "Will Mr. Andrews please explain how to obtain the angle of principal axis to the line ZZ in the example of a 5in. x 3in. x ½in. unequal angle given in his book, p. 167? The formula to obtain this is not given in any of my books, and would be of much use to the writer."

Find the moments of inertia of the section about any two axes XX and YY intersecting at the centroid and at right angles to each other, and let these be I_x and I_y Next find the moment of inertia I_w about a line WW, also passing through the centroid and at 45 degrees to XX and YY.

Then if a is the angle of inclination of the principal axes to XX or YY, a is given by the relation

$$\tan 2a = \frac{I_x + I_y - 2I_w}{I_y - I_x}$$

The moments of inertia I_u and I_v about the principal axes are given by:

$$I_u = \tfrac{1}{2}\left[I_x + I_y + \frac{I_x - I_y}{\cos a}\right]$$

$$I_v = \tfrac{1}{2}\left[I_x + I_y - \frac{I_x - I_y}{\cos a}\right]$$

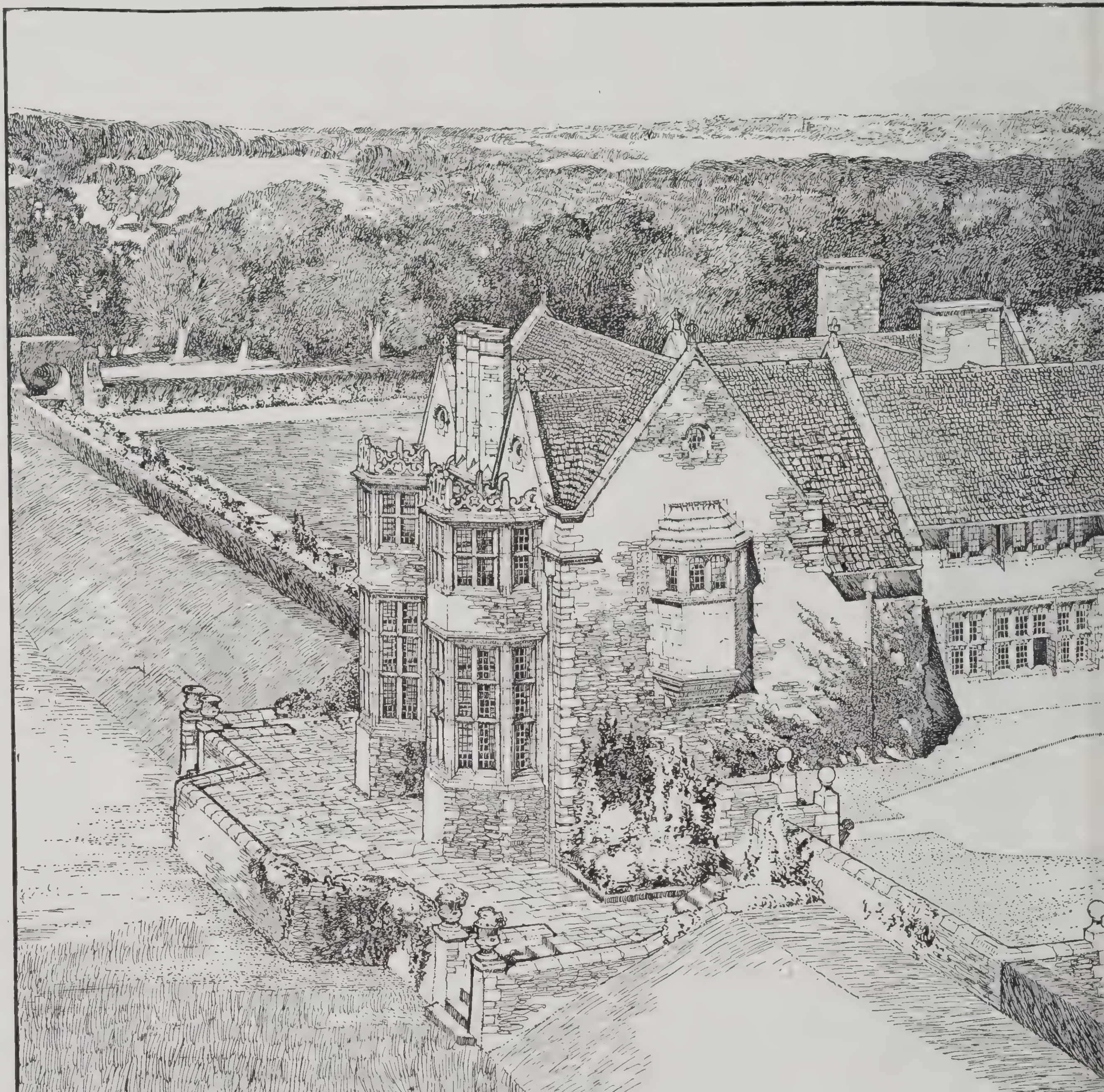
A.

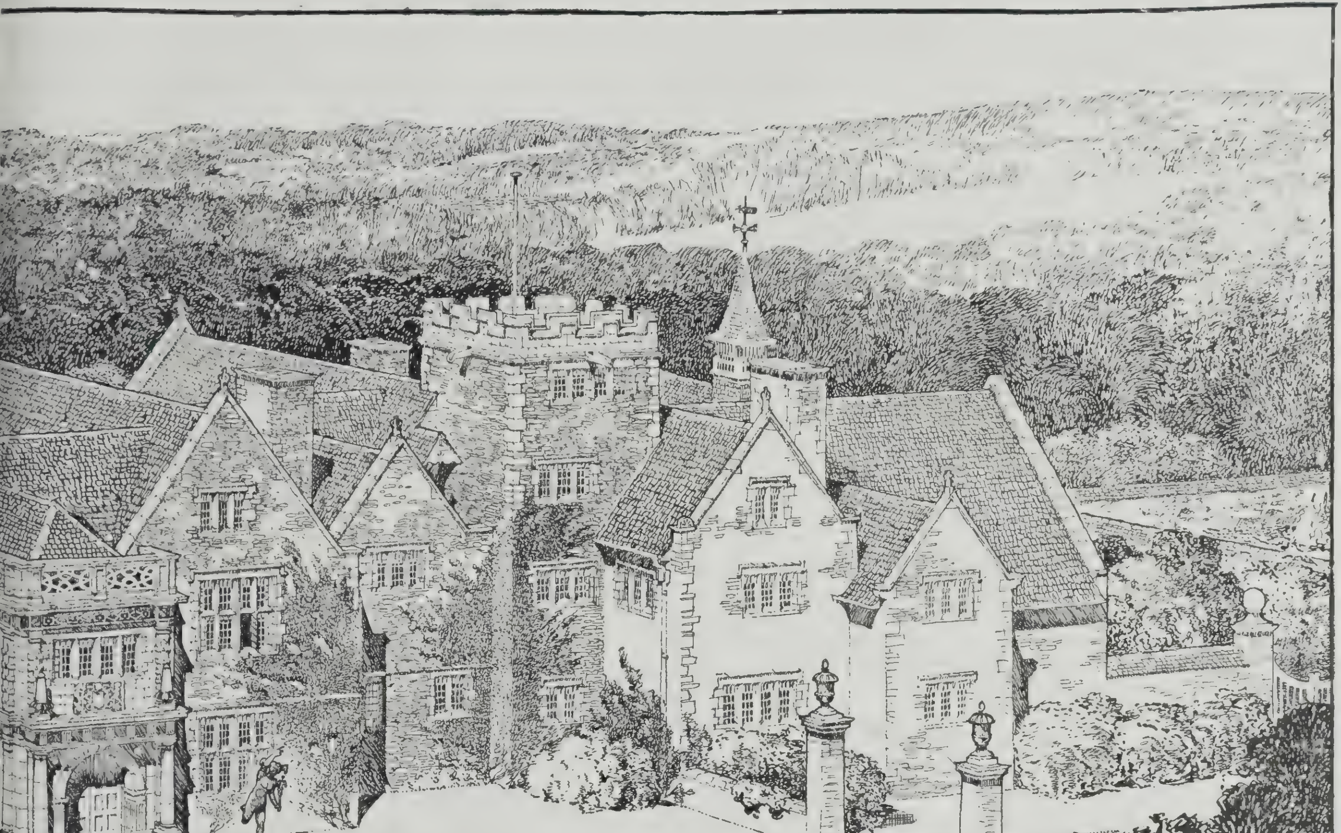
Stress Diagram for Open Timber Roof Truss.

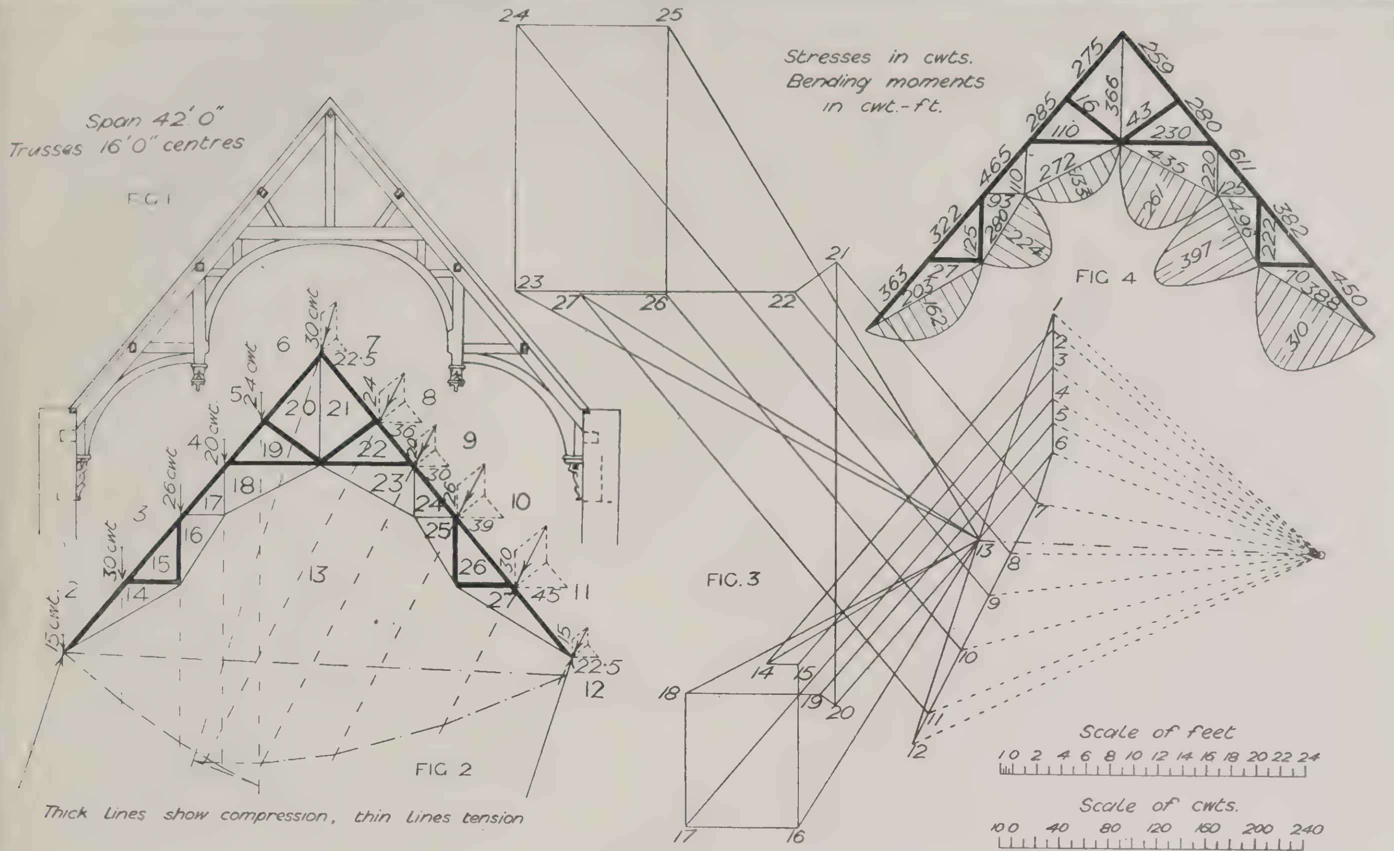
YORKS.—"H." writes: "The tracing enclosed [not reproduced] shows, in outline, a timber-framed roof truss. Will you inform me, through the medium of your paper, whether the "nature" of the stresses, as suggested by the arrows, has been correctly estimated, and how in a truss of this type they may be obtained graphically?"

The elevation of truss submitted is shown in Fig. 1, and in Fig. 2 is shown the nearest approximation to a frame diagram for the truss. Allowing a vertical structural load of 28lbs. per ft. sup. and a horizontal wind pressure of 42lbs. per ft. sup., the loading will be as shown, whence the load line may

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS




AN DOMINI
MCMIX
REBUILDING of
NETHER SWELL MANOR
GLOUCESTESHIRE
E Guy Dawber Architect
ROBT ATKINSON DEL 09



Thick lines show compression, thin lines tension

ILLUSTRATING REPLY TO YORKS.—"H."

set down as in Fig. 3, the reactions ob-ned, and the stress diagram completed. ie stresses may then be scaled off and irked on the frame diagram Fig. 4. The nding moments on the curved members are so shown on Fig. 4, the maximum bend-moments being obtained by multiply-the direct stress in the bar by the versine the curve. The members in direct com-ession are then calculated by the formula

$$W = \frac{F\,S}{1 + \frac{1}{a}\left(\frac{l}{d}\right)^2}$$

iere W = total safe load in cwts., F = safe id on short specimen in cwts. per sq. in. t section = 13 for oak and 6 for fir, S = tional area in sq. ins., a = constant—100 square or rectangular sections flat one d and rounded the other, l—length in hes, d = least diameter or width in inches. ie members in direct tension are calculated allowing 13 cwt. per sq. in. net section oak, and 4 cwt. per sq. in net section for . The curved members are calculated by formula

$$\frac{W}{A} + \frac{M}{Z}$$

iere W = direct tension or compression in ts., A = net sectional area in sq. in., M = ding moment in cwt.-ins., Z = section dulus in inch units. When compression the chief stress the intensity obtained by is formula must not exceed the safe stress taking the member as a strut and working by the formula

$$W = \frac{F}{1 + \frac{1}{a}\left(\frac{l}{d}\right)^2}$$

where W = safe stress per sq. in., the values of the other letters being as given before, S being omitted.

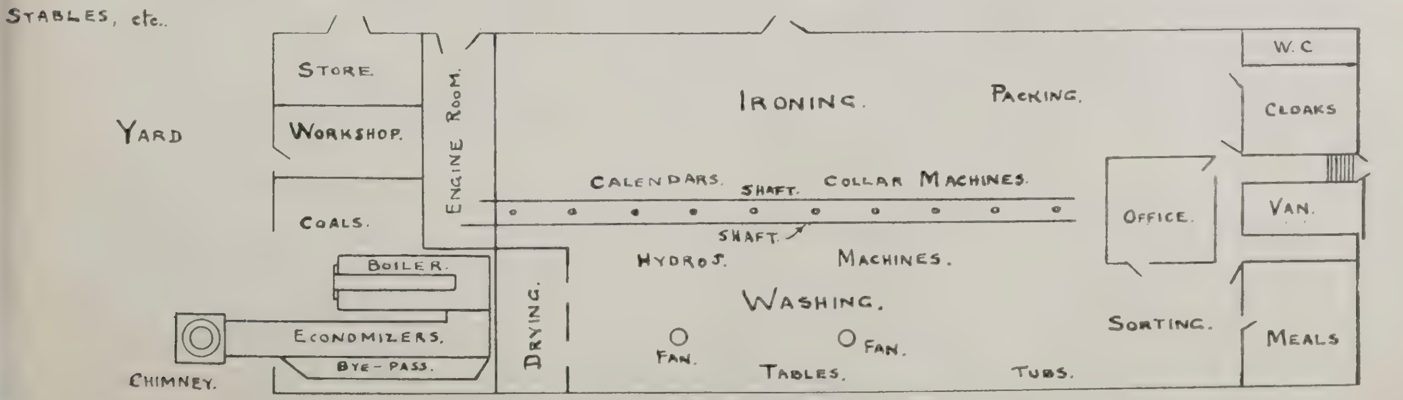
HENRY ADAMS.

Washhouses or Laundries.

BURNHAM.—In answer to "W. J. P.":—

These require extra stout roof timbers, stout walls or pilasters, if shafting be fixed to these; first-rate drains with plenty of inspection chambers, one to each machine is not too many, and one to each 12ft. straight of drain at hand tables; and all the north-east or north-west light you can get. A covered loading and unloading place for vans is also desirable, and a 5ft. glazed brick or tile dado at the washing place is the best; and concrete foundations for all machines, with concrete floors for the wash-house, and wooden floors for the rest. To remove steam from the wash-house, two fans are best, one driven by the wash-house shafting and the other by the ironing-room shafting; and the air supply to these fans comes from the drying chambers and ironing rooms. In winter the air that enters the packing and ironing room is warmed by steam pipes ere it enters the room, and the same at the sorting room, for warmed air is needed to completely remove steam from a wash-house. The drying may be by "horses," or in a room through which hot air is moved by a fan, the spent air being sent to either the wash-house or the open. The driving may be either steam or gas engine or electric motor; suction gas engine is the cheapest. As the wash-house is not always at work during the same hours as the ironing room, two engines, or fast and loose pulleys or clutches, are needed to disconnect the shafts.

As the "calenders" for ironing and drying blankets, sheets, curtains, etc., are heated by steam of from 45 to 60 lbs. pressure, a steam boiler is needed, and one "economiser" to heat the water that feeds the boiler, and perhaps a second economiser to heat the water for the washing. Economisers are batteries of vertical pipes, placed in the flue between the boiler end and the chimney, and the water is pumped through these pipes to get heated by the hot gases that leave the boiler flues. If the water be hard you may do well to collect all the rain from the roofs, and mix it with the hard water to lessen and soften the scale inside the boiler. A hot sulphur spring gives good boiler water. The chimney will be 80 or 90 ft. high and should be at least plumb inside; and if it can be larger inside as it nears the top, so much the better. (See the articles in "The Builders' Journal" on "Tall Chimney Construction," Nos. 703, 704, 705, and 707).



ILLUSTRATING REPLY TO BURNHAM.—"W.J.P."

The accompanying drawing shows the requirements for a laundry employing about 60 hands, and the Factory Act clauses as to number of closets, size of cloak-room, etc., have to be met in the spirit as well as to the letter. The large machine-making firms, such as Summerscales. Manlove Alliott, Tullis, Bradford, etc., whose addresses can be found in "The Builders' Journal" and in "Specification," will supply power and arrangement plans for a stated quantity of washing, and will fit up the laundry complete.

If you are required to adapt an existing two-storey building to a laundry, you must make the best of circumstances. You can have a vertical steam boiler to supply the wash machines and calenders, all on the ground floor with the drying perhaps also. The ironing and packing will be upstairs. A fan is required to ventilate gas-iron rooms, though the factory inspector may allow one machine in a lofty and ventilated room. This fan may in some cases blow into the drying chamber or the wash-house. If ordinary flat-irons be used, the stove has to be in a separate room or space bricked off from the ironing room itself.

The Board of Trade requires the attendant to any steam boiler to be a male over the age of 18.

If the only machines are to be gas-heated irons, the hot-water can be obtained from a heating apparatus boiler, and the clothes can be boiled in cast-iron pans each with its own fire and chimney, and containing 50 or 60 gallons of water. The steam from these can be led away by hoods above them to wooden shafts through the roof, each shaft having a lid to be closed at night. The smoke can be used in some cases to heat air for the drying room and removing steam, as can the exhaust from gas-engines of more than 25 b.h.p.

A meal-room separate from the work-rooms is required by the Act for workpeople taking meals on the premises, and a special place for cloaks, which may have to be warmed in winter to dry the cloaks. Of course, separate closets for the sexes will be provided.

The temperature at which clothes may be dried depends in part on the water, and in part on the chemical constituents of the soaps and glazes. In any case, the hotter the air the quicker the drying.

The foundations and walls of boiler seat and flues must be separate from those of the building; a 2ft. 6in. space between their walls is not too much. If the two join, the walls are likely to crack and buckle the roof. The building shown is intended to be lit by windows and skylights: and its roof to be two-peaked and hipped at the end of the laundry proper. The power end will have a separate roof, hipped or gabled as required.

INGENIOR.

Stresses in Walls.

TRING.—"A CONSTANT READER" writes: "In finding the tension and compression at each face of a wall, the formula

$$P=\frac{W}{A}\pm\frac{M}{Z}$$

is used; what does each of these letters denote, and why *plus* or *minus* $\frac{M}{Z}$?

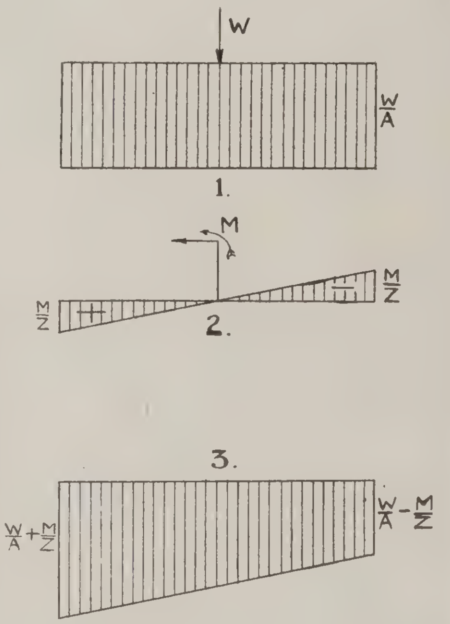
W = Weight of wall (in tons say)

A = Area of horizontal section of wall in sq. in.

M = Bending moment acting on given section of wall in inch-tons.

Z = Section modulus of wall at given section in inch units.

In the most usual case the wall is rectangular in horizontal section, and then $Z=\frac{bt^2}{6}$ where t is the thickness of the wall in inches and b is the length of the wall in inches. The value $P=\frac{W}{A}+\frac{M}{Z}$ gives the compression stress in tons per sq. in. on the compression face and the value $P=\frac{W}{A}-\frac{M}{Z}$ gives the compression stress on the tension face.



The distribution of stresses will be clear from the figure, where: (1) Shows the stress due to the weight of the wall, this being uniformly distributed; (2) shows the stress due to the bending moment due to horizontal forces, such as wind, this stress being proportional to the distance from the neutral axis as in an ordinary beam; (3) shows the combined stress due to dead weight and bending moment, this diagram being obtained by adding (1) and (2), making due allowance for sign. The *minus* sign corresponds to the tension portion of the stress due to bending moment. A very good paper by Prof. Adams on the stability of walls will be found in "The Builders' Journal" for January 27th, February 3rd and 10th, 1909.

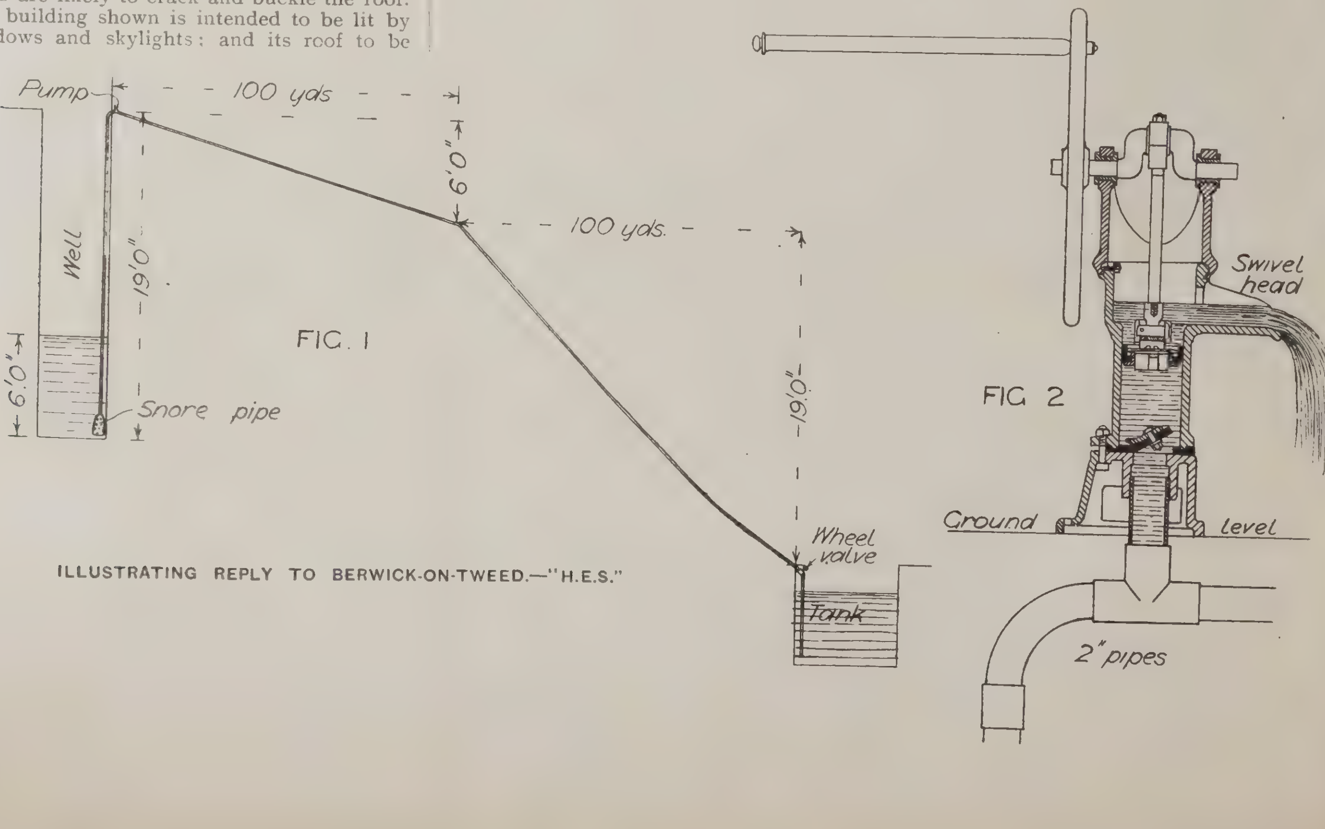
A.

Water Syphon.

BERWICK-ON-TWEED.—H.E.S. writes: "We wish to syphon water from a well to a tank by a 10in. pipe. The accompanying sketch shows the position of the well and the tank and the contour of the ground. What is the proper way of doing this, and would it work satisfactorily?"

A syphon pipe 1in. in diameter could not give more than three gallons per minute. It would require very careful workmanship, as the slightest air leak will prevent it from working, and a pump must be placed at the highest point, as shown in Fig 1. An ordinary suction pump can be applied (such as W. H. Bailey and Co.'s, of Albion Works, Salford), as in Fig. 2, but owing to the size of the foot valve, there will possibly be some difficulty in keeping it air-tight, and more frequent pumping will be necessary than if a small specially made air pump were applied. In setting the pipe to work, the wheel valve should be closed, the tank filled above the mouth of pipe, the pump worked until the water comes out of the spout, the wheel valve then opened and the pump again worked until all the air is withdrawn, the syphon should then be in working order. Air will tend to collect in the upper part of the pipe and require removal by the pump. A 2in. pipe would give about 16 gallons per minute. It will be an advantage to make the pipe from the well to the pump 2in. diameter, as shown, whatever size the remainder of the pipe may be.

HENRY ADAMS.

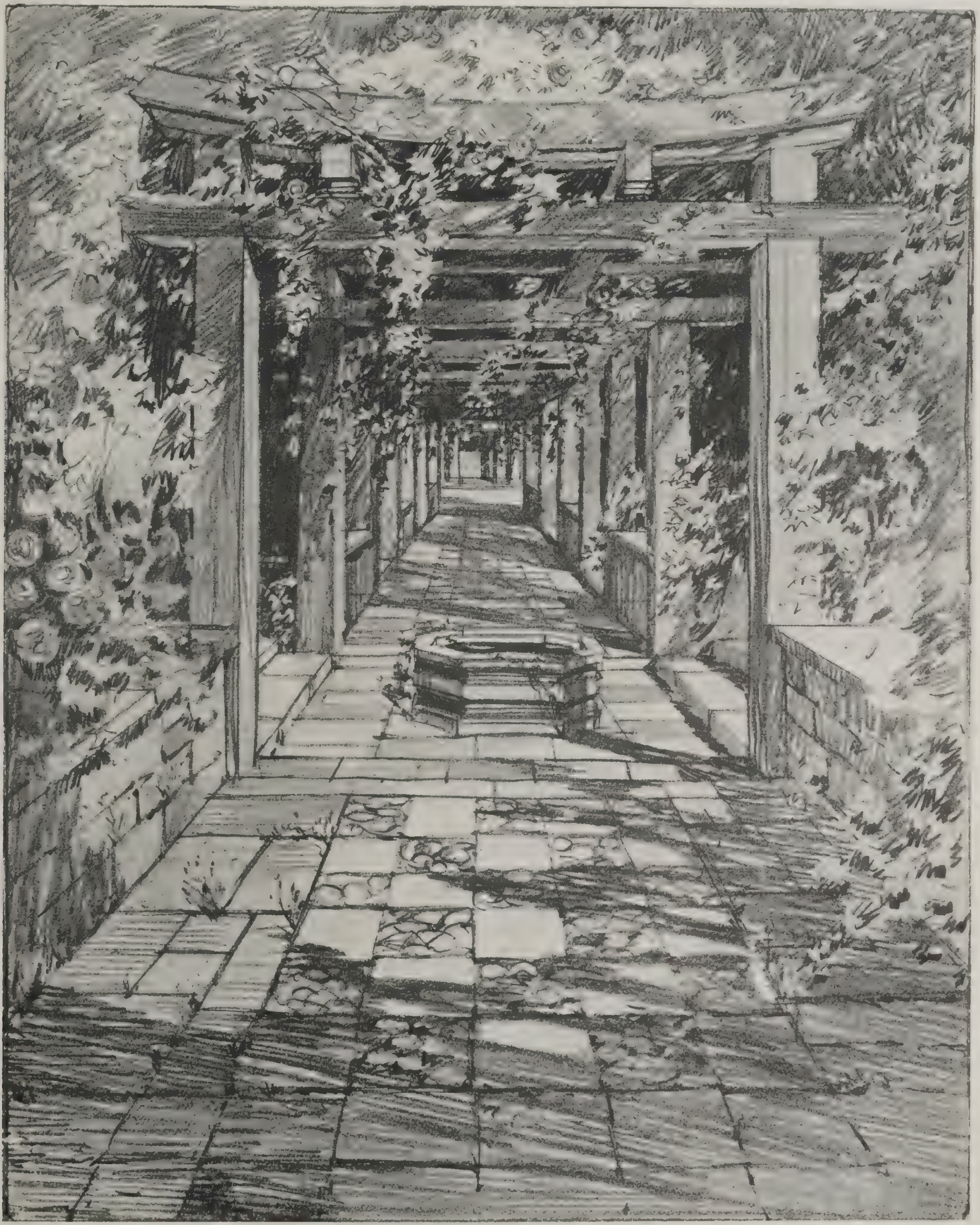


ILLUSTRATING REPLY TO BERWICK-ON-TWEED.—"H.E.S."

JAPANESE GARDEN ARCHITECTURE.

An excellent persuasive to garden design has been published by Mr. John P. White, of the Pyghtle Works, Bedford, and 134, New Bond Street, W. It takes the form of a chastely produced booklet, containing sixteen excellent half-tone engravings, of which, by courtesy of the publisher, we are able to show two examples. The joys of gardening are set forth most alluringly in a graceful introductory essay by Mr. Rowland E. Prothero, who takes for his text a passage from Abraham Cowley's Epistle to John Evelyn: "I never had any other desire so strong and so like to covetousness as that one which I have had always—that I might be master at last of a small house and large garden, with very moderate conveniences joined to them, and there dedicate the remainder of my life only to the culture of them and study of nature." This wish, as Mr. Prothero remarks, "is adapted to all sorts and conditions of men." He points out the antiquity of the gardening cult. He says that it is as old as time. It is at least as old as civilisation. The square palisaded garden was a feature of Ancient Egypt. Assimilated and developed by the Greeks, the art was inherited by the Romans. The passion is universal. English gardening was insignificant until Tudor times, and although Henry VIII. and Wolsey had their formal and architectural gardens, it was not until the spacious days of great Elizabeth that a national style was developed.

This was based on an assimilation of Italian ideas; and the spirit of the Italian garden is architectural. "Its creators," says Mr. Prothero, "were masters of the art of composition. The principle which governs the building of the house is extended to its immediate surroundings; the lines of the dwelling-place are followed in the pleasure grounds, and the domesticity of the one is linked to the natural beauty of the other." Many a noble garden was destroyed during the Civil Wars, and the art of gardening, like all the other arts of peace, was naturally neglected. With the Restoration the revival of gardening was based on the rather theatrical style of which the pictures of Watteau convey a fairly correct impression. Huge fountains and a plenitude of plaster statuary were essential features.



DESIGN FOR PERGOLA ADAPTED FROM THE JAPANESE TORII.

With William and Mary came the Dutch style, prim, precise, and puerile. In the eighteenth century topiary work was the butt of the wits. Pope and the "Spectator" girded at it until it became insufferable. Then came the Chinese style, and afterwards the Romantic school, with its vistas and prospects, and mock temples and obelisks and busts; and now we seem to be gradually evolving a new Renaissance.

SUMMER-HOUSE WITH TRELLIS SHUTTERS. ERECTED, AFTER A JAPANESE MODEL, AT OCKLEY HOUSE, BEDS. (From "Garden Design.")

To whom should we go for vital inspiration with greater assurance than to the Japanese? The Japanese have a genius for artistic or architectural gardening. There is a demand for bridges, summer-houses, etc., in the Japanese style; and it is in response to this demand that Mr. John P. White has published the interesting and handsome booklet under notice. Even as our forefathers in taking the Italians for their guides did not yield themselves up to slavish imitation, so it may be supposed those who base themselves on the Japanese style will be influenced by its spirit only, and will modify the details so as to bring them into harmony with English surroundings. It is the spirit that quickeneth, not the letter that killeth, which is observable in the original designs shown in Mr. White's booklet. These, while strongly reflecting Japanese influence, show a very sympathetic adaptation to Western environment; and how admirably they express essentials without slavish regard for details may be seen on comparing them with the Japanese work shown in the photographic reproduction of typical examples of genuine Japanese gardens and garden structures.

It is becoming increasingly apparent that the architect of to-day must reckon with a general intensification of the regard for architectural gardens. This booklet is at once an evidence of the movement and a means of accelerating it.

An illustrated account of the City of Carlisle has been published by the Corporation with a view to directing attention to the advantages which the city offers to those desirous of establishing factories or works. Many illustrations and a folding map are included.

* * *

"The Concrete Institute Transactions and Notes," Volume I. (Part I), issued from the offices of the Institute, 1, Waterloo Place, Pall Mall, S.W., contains reports of the first and second general meetings of the Institute, and gives in a series of notes much information concerning the constitution and objects of this new and vigorous organisation.

Views and Reviews.

Churches Damaged by Lightning.

Lightning and the Churches. By Alfred Hands, Fellow of the Royal Meteorological Society. London, J. W. Gray and Son, lightning conductor experts, 91, Leadenhall Street, E.C., 1s.

Before the adoption of efficient means of protection, it seemed to be the natural fate of a church to be struck by lightning; and even nowadays the average number per annum of churches in Great Britain that are struck and damaged in about twenty; and in an appendix to this excellent monograph, Mr. Hands gives a list of 244 British cathedrals, churches, and chapels reported to have been damaged from this cause between 1899 and 1908. Yet, of the 3,401 buildings that were damaged by lighting in England and Wales during eleven years (1897-1908), only about six per cent. were churches, whereas eighty-four per cent. were comparatively low structures. Mr. Hands states that while it is obvious that the lofty spires and towers of churches are objects that are very apt to be struck by lightning, yet, within certain limits, difference in height does not make the great difference in danger that might be supposed, and not all the churches struck have been conspicuously taller than the other buildings in their vicinity. This and many other points of interest are discussed very judicially in this instructive and interesting little book, which is enriched by a number of views showing the havoc wrought by lightning, and diagrams illustrating the author's deductions from data collected during many years of close investigation and patient study of a subject in which his knowledge and experience are probably unrivalled.

Fons et Origo.

Fonts and Font Covers. By Francis Bond, M.A Illustrated by 426 Photographs and Drawings. Henry Frowde, Oxford University Press, London, New York, and Toronto. Price, 12s. net.

Although two books on fonts were published sixty years ago, and although Mr. Bond is able to produce a bibliography that includes more than fifty entries, the varied interest of the subject, and the wealth of materials that the author has found awaiting examination and description, will come as a revelation even to those who knew enough to be aware that hitherto this particular branch of art and archæology had never received adequate attention. To Mr. Bond, in fact, belongs the distinction of producing the first comprehensive book on fonts and font covers, and the first attempt to give anything like a complete view of their history and evolution. When Christianity began to take root in Rome and Greece, the domestic bathrooms offered a ready means of performing the rite of baptism. Regularly constituted baptisteries of the fifth or sixth centuries, or even earlier, are still in existence at Rome, Ravenna, Istria, in the south of France, and elsewhere. In many cases the piscina or tank was below the ground level; and in demolishing the old church of St. Clements, Tours, a concrete font was found about a metre below the surface. It was cylindrical, 16in. deep and 33in. broad. As the practice of infant baptism increased, and adult baptism declined, the font began to supersede the baptistery; and the earliest type of font is tub-shaped and unmounted. Afterwards, in order that the ministrant should not have to stoop inconveniently low to the water, the font was raised on legs, and by the fourteenth century it had become usual to mount it on a tall pedestal. The Italians took to modelling their fonts in the form of a chalice, which they soon began to adorn with carving. Long after the chalice form had been adopted in our own country, Puritan zealots would wilfully smash it, and use instead a dish, basin, or pail; and during the Commonwealth the basin was pretty general. Then disappeared, no doubt, many interesting examples that, had they survived, might have enriched Mr. Bond's book. Mr. Bond, disregarding Viollet-le-Duc's despair of the possibility of classification, has arranged fonts in accordance with their external design. He divides them first into unmounted and mounted. The former may be further classified as cylindrical, rectangular, polygonal, caldrons, and block fonts; the latter, as those of which the bowl rests on several legs, and those with one leg or a pedestal.

The decoration is, of course, often symbolical, and the fonts are made of various materials—chiefly of stone; but in a chapter dealing mainly with metal fonts, it is mentioned that at Canterbury there was once a font of silver, and that Queen Elizabeth gave a golden font to Mary, Queen of Scots, and another to Charles IX. of France, each valued at £1,000. Bronze, pewter, wood, and silver-gilt have been used; and of a considerable number of lead fonts most belong to the late twelfth or early thirteenth century. A few examples are of brick. Where the bowls are of freestone, they are commonly lined with lead. In the chapter on font covers, Mr. Bond has the assistance of Mr. Frederick Charles Eden. The covers, at first only flat lids, became in time more or less elaborate in design and decoration, and, like the fonts, they often bear inscriptions. The illustrations in which the book abounds almost to lavishness, are of much architectural interest, and, studied chronologically and with due regard to locality, would probably throw considerable light on the development and progress of decorative design. In accordance with Mr. Bond's admirable practice, the book is furnished with both an index locorum and an index rerum.

An Octaval System of Counting.

There is always a *tertium quid*. If ever the decimal system overcomes the duodecimal, there will remain the octaval to reckon with, or not to reckon with, as events may prove. Mr. S. S. Buckman, F.G.S., has issued, price sixpence, through Messrs. Parker and Son, 27, Broad Street, Oxford, and Messrs. Simpkin, Marshall, Hamilton, Kent and Co., Ltd., a pamphlet entitled "An Octaval instead of a Decimal System; an essay to show the advantages of an eight-figure and the disadvantages of a ten-figure notation for money, weights and measures." It is a very ingeniously elaborated essay; but as the system involves a revised notation, and incidentally takes considerable liberties with the multiplication table, its chance of adoption in this conservative country seem to be rather remote.

THE SPECIFICATION AND INSPECTION OF TIMBER.

By J. Davies.

Abstract of a paper read before the Society of Architects by Mr. J. Davies, of "The Timber News."

(Concluded from page 332, No. 740).

Undoubtedly the old-fashioned Memel, and some of the Danzig, was very fine, mature wood, of slow growth, very sound and clean, and of great durability. But the best trees in the easily accessible forests were cut down faster than they grew, and what we get now is not quite so good. Or, to put it another way, while there may be some Danzig wood of the old-fashioned quality in the logs of to-day, its proportion is much smaller, and the waste in conversion would be prohibitive. So that there is no object in specifying this wood in preference to Swedish or Russian, so far as the latter is obtainable in the required sizes. The question then arises, "Where large sizes are required for main structural work, what is the best alternative, seeing that we do not receive imported planks larger than 12in. by 4in. from Russia or Sweden?" The answer to this is, Pitch pine, and some would include the Douglas fir, or Oregon and British Columbian pine, the merits of which we will discuss when finished with the European fir.

We spoke of

Russia and Sweden as Sources of Supply

Going into details, we may say that the important ports of shipment in Russia are Petersburg and Archangel. We receive both joiners' and carcassing stuff from each, Petersburg being usually sorted into 1st, 2nd, and 3rd, and Archangel into 1st, 2nd, 3rd, 4th, and a few fifths. The shipments can usually be distinguished by their being marked with a hammer stamp on the ends, without any paint, the Swedish being usually marked with stencilled letters in paint.

We have already referred to the Petersburg, yellow or red, as having deteriorated somewhat. It once exported some very fine deals and planks indeed. It still sends us some very good wood, and the quality is quite high enough to warrant its inclusion in specifications as ports of origin for joiners' stuff. But the merchant or builder has to allow for the presence of a number of deals which could not be utilised for the finest work, even in the best quality.

The wood from Archangel is the best of all for the most exacting kinds of indoor work. Its heartwood is less red than that of Petersburg stuff. It is very mild and easy to work, being less likely to warp than similar wood from any other part. In expatiating on its excellencies, of course, it is understood that we are speaking comparatively, seeing that the best we get from any shipper is very far from perfection. The word Archangel covers all shipping places in the White Sea, of which there are many, including Kem, Kovda, Keret, Mesane, Onega, Soroka, and Umba. There is little or nothing to choose between the various shipments, one being better this year, another next, and so on. Some of the better known marks are double eagle, OWC, MM, BB, NRS, JM, SMK, KEM, PBS, W. The first and second qualities are used for joinery, and selected thirds are also taken for similar purposes in cheap work. The thirds, and sometimes fourths, are used for carcassing.

There is a

Large Timber Industry in Finland,

and many ports send carcassing stuff, mostly of the cheaper order. There are two very useful brands shipped from Bjorneborg, BS1stSC and RF1stSO. The cheaper qualities from these shipments are very useful for ordinary timbering work, and there is another Finnish port which is worthy of some attention, as sending large quantities of very sound and usable carpenters' stuff, marked KEMI in red paint, the port of shipment also bearing this name. I emphasize this as the KEMI Company supply the London importers with numerous cargoes of this brand. It is well manufactured and shipped in good condition, as a rule. The wood is a little too strong for joinery, but is none the worse on that account for use where a load is carried. It has been tacitly accepted by many architects as a fair and reasonable standard for medium to good class work, and may perhaps be known to some of my auditors. If so, I should be glad to learn the professional opinion of it in the course of any discussion that may arise.

The Timber of Sweden and Norway.

We now come to Sweden, which has a large number of shipping districts, the better known of which are Gefle, Soderhamn, Hudekswall, Sundswall, Skelleftea, and Lulea. The shippers are numerous, and their marks are legion. The various makers sort their output into 1sts, 2nds, and 3rds, on the one hand, and 1sts, 2nds, 3rds, 4ths, and 5ths, on the other. It is worth remembering that the thirds of some shippers are no better than the fifths of others, and that in Swedish stuff particularly the nominal quality has no great significance. The best wood is very clean, perhaps more free from knots than even the best Archangel shipments, but shows more sap, while even the highest grades contain their full share of centres. Still, properly converted, the first quality Swedish wood makes finished joinery second to none, costing a little more in labour perhaps than Archangel. It is therefore quite fitly included in joinery specifications, and the thirds and fourths make tough timbering sizes, the former being about similar to KEMI. I think the harder nature of the wood makes it superior to the Archangel for stress bearing purposes. A few of the better known brands are as follows: Joinery BSSC, KHB, KAB, SKB, with their respective seconds, which, in the same order, are BC, HAB, NAS, DOM.

Leaving Sweden, we come to Norway. The wood mainly consists of planed boards, floorings, and matchings, for ordinary speculative building, and so forth.

White Deal and Red Pine.

Leaving the yellow deal, there are one or two other woods which claim passing notice. There is the white deal of commerce, *Picea excelsa*, growing within much the same limits as *Pinus sylvestris*. We receive it from Russia, Sweden, and Norway, in the form of planks, deals, and boards. It is not so durable as yellow deal, and is not used for constructional work in the South, although it is largely used, with its American cousin, Canadian and Newfoundland spruce, which it resembles, for cheap work in the North and Midlands. It does not shake so readily as yellow deal, and some of the Archangel and Petersburg shipments are very free from large knots. It is therefore used for internal fittings, etc., but has not as yet entered into the calculations of the architect. The increasing difficulty of obtaining thoroughly clean and sound yellow deal, however, may yet bring it more largely into use in situations where it is not exposed to damp or the weather. The sap in this wood is very difficult to distinguish from the heart, which is or is not a virtue, according to the point of view.

We then come to Canadian red pine (*Pinus resinosa*). This is very similar to our European yellow deal, and was regularly imported before Russian and Swedish wood drove it out of the market to a large extent. It is sometimes used as a substitute for yellow deal, and may be accepted as such without hesitation, being quite equal to it in durability. The best parcels are quite as expensive as the higher-class European imports, and are preferred by some in the belief that they do not shake in seasoning to so large an extent as the latter. When worked up, an expert would find it difficult to distinguish from yellow deal, although the difference is fairly obvious in the imported plank

This brings us to the consideration of pitch pine (*Pinus australis* and *pinus palustris*), from the eastern seaboard of the Southern States of North America. It is imported in boards, deals, planks, and logs. I need say nothing in recommendation of it for joinery purposes, except to emphasize the excellent quality of the highest grade boards. It is sold in boards up to 12ins. and 14ins. wide, practically free from knots and sap, thereby permitting the builder to turn out work creditable to himself and satisfactory to his client, which is not easy of accomplishment when the material is yellow deal. As a substitute for the Memel or Danzig fir it is now almost universally accepted by public bodies as well as private individuals, and I hope that architects will render it its due meed of recognition by specifying it, except in those rare cases where special considerations make the European fir necessary. I may say that Laslett, the author of "Timber and Timber Trees," and once Timber Inspector to the Admiralty, made exhaustive experimental comparisons between pitch pine and Danzig fir, which seem to show that there is no appreciable difference between the two.

We next come to

Oregon or British Columbia Pine,

which is, strictly speaking, a fir, being known to many as Douglas fir. The wood bears a close resemblance to pitch pine, both in the balk and when worked up. It has one or two advantages over pitch pine, inasmuch as it is imported regularly in very useful sizes, sawn into square-edged planks, 4, 5, 6, 7, and 8ins. thick, 12 to 18, and sometimes 20 to 24ins. wide, in lengths of from 12 to 40ft. These are piled under sheds in the docks, instead of being floated in the ponds, which is the usual method of storing pitch pine. The few parcels of pitch pine planks which are imported in similar dimensions do not seem to remain so sound as the Oregon pine when kept out of the water, so that the contractor, in converting roof and other timbers, has to remove the outsides from pitch pine logs, at considerable loss to himself. On the other hand, the dry Oregon pine planks minimize the waste, and the enormous dimensions of the tree permit shippers to send them practically free from sap. Against these advantages is to be set the conviction of some that Oregon pine is less durable than pitch pine. Without being dogmatic on this point, it must be admitted that the spring wood in some of the faster grown trees is somewhat soft, and scantlings converted from them would not stand alternations of wet and dry conditions so well as pitch pine. If the slower grown wood is selected, however, and it is used for internal work, many architects make no objection to its use. It is fair to set off its greater freedom from sap and shakes against the possibly superior toughness of pitch pine. It is used by a sufficiently large number of architects to warrant its inclusion in the list of merchantable alternatives to Baltic fir, and subject to the conditions named is regarded as a reasonable substitute for pitch pine. The ordinary or merchantable quality is used for constructional work, and there is a higher grade, known as select, which is worked up into joinery. There are no so-called firsts and seconds in the shipments, nor are there any well-known and authoritative marks such as can be quoted as a permanent standard. One large firm of shippers, the Hastings Saw Mill Company, mark their ordinary quality with one crown and their select with two, but the practice is not universal.

There is no difference between the Oregon and British Columbian wood, the distinction merely indicating the shipping district. Sometimes merchants possessing the British Columbian variety are inclined to consider that the better, but the arrival of a good cargo of Oregon pine usually dissipates that impression.

Joinery Timbers.

This exhausts the regular carcassing timbers. A considerable amount of Quebec yellow pine and Kauri pine is used for joinery, and gives admirable results. It may be worth while to note in passing that yellow pine (*Pinus strobus*) is largely known in America as white pine, and in England is sometimes called Weymouth pine. It is the mildest and easiest to work of all the pine family, being used by engineers for pattern-making.

Kauri pine is a New Zealand wood (*Dammara australis*). It yields magnificent planks, and is one of the very few woods which are obtainable in large dimensions quite free from pith, knots, and sap. It makes very handsome joinery, and its use is always a source of satisfaction to the contractor. It is one of the very few woods which shrink endways, or in the direction of the grain, in seasoning, but the fault can be overcome by reasonable care in conversion. This wood is not to be confounded with Karri (*Eucalyptus diversicolor*), which is a hard wood, used for paving blocks, piles, etc. It bears no resemblance to Kauri pine, but the similarity in name and the fact that it is an Australian wood sometimes cause confusion.

The foregoing references to the soft woods of commerce will, I hope, help us in agreeing upon the formulæ which we seek. But before building them up we may spend a minute in considering one or two facts which apply to soft woods generally. The first is that the quality of nearly all timber imported into England has steadily deteriorated during the last twenty years, the leading exception, viz., Kauri pine, being unfortunately a joinery and not a carpenters' wood.

Inaccessible Supplies.

No doubt there are thousands of mature and well-grown trees in the forests of Europe and America which would yield just as good timber as that which we used to receive. But the trouble is that they are, so far, inaccessible. The foreign shipper will not buy or cut down trees upon which he cannot earn a profit. When the cost of carriage rises beyond a certain figure, it becomes prohibitive, and the shipper falls back upon those forests which lie sufficiently near to the railways and rivers to permit of his getting the wood to the port of shipment at a certain price. These have already been worked, and the finest trees removed. Natural regeneration and state regulated replanting together fail to keep pace with the development of the world's demand. European countries which once dipped very little into the available Russian and Swedish supplies now compete with the United Kingdom as bidders for yellow and white deal. At this moment Italy is buying it very largely for the erection of temporary buildings in Sicily and the mainland, in consequence of the recent disastrous earthquake. The standard of comfort in the poorer countries is rising, which means that the demand for wood per head per annum is increasing. Our own Colonies import Baltic stuff for house building, finding it cheaper to do that than use their own woods, which are either too hard to work for the purpose or too valuable as exports, so that South Africa, Australia, and New Zealand are growing markets for the material we want.

Ninety Years to Wait,

Afforestation will not help us in our own generation. Although yellow deal now grows in the United Kingdom, it does not exist in really merchantable quantities or dimensions. The Royal Commission which has recently reported upon afforestation is of opinion that it can be grown here in bulk, and that scientifically planted forests will eventually produce good, clean, usable timber. But we shall have to wait about ninety years before the trees will yield cut stuff sufficiently wide and long. Meanwhile, the destructive process is going on, and the cutting of young wood in Norway and Sweden for wood pulp is further retarding the work of replenishment. Therefore, we must do the best we can with the resources at our command, and while anxious not to appear as an apologist for poor or shoddy work, I think we must take these facts into account in the specification and inspection of timber. Importers appeal to agents and shippers in vain for deals and planks which shall be free from sap, shakes, large, loose and dead knots and other defects. Money will not buy them. Timber is not a manufactured article, which a sufficiently tempting price will bring forth in perfection. It is a natural product, and the architect, builder and merchant have jointly to bemoan the fact that Nature is a wasteful woodman. The picturesque shapes which make a well-wooded landscape so attractive spell defects in the woods, from an architectural point of view. If you take a walk through Kew Gardens, or through such a well preserved section of the Sussex Weald as the Duke of Norfolk's Natural Park at Arundel, you will see some noble trees, but surprisingly few which are sufficiently straight in the stem and free from branches to produce a 20ft. plank free from pith, sap, and knots. The sap is the circulatory system of the tree. The growing stem of the tree must of necessity use twenty or thirty of the newest rings as avenues up and down which its life blood must travel. Every broken branch means a dead knot. External injuries produce rindgalls. Wind and frost cause cup shakes. Fungi induce decay.

To sum up, the wood of to-day is admittedly imperfect, and the question arises, "What measure of imperfection, if any, is permissible in timber used for contract work?" The answer to that question will determine the wording of timber specifications.

What Shall We Say about Sap ?

It is safe to say the area of a transverse section of a typical *Pinus sylvestus* will show about two-thirds heart and one-third sap. That two-thirds heart is roughly circular in shape. Cut a parallelogram from it. You have about half the area of the original section in that parallelogram, with a centre, or pith, in it. Can we afford to lose half the tree? Of course, everything depends upon the class of work in hand, and for some exceptional contracts, no doubt every particle of sap must be eliminated. But is that always necessary?

If trees are felled in the winter, when the live sap is not filling the cells, and properly seasoned, the sapwood is visible but bright, and light coloured. If trees are felled during spring and summer when the juices of the tree are circulating, the cells contain chemical combinations which are liable to decomposition or to the attacks of fungi. The sapwood of such trees becomes discoloured, turning green or blue, and is unfit for use. At best the sapwood is less durable than the heart. But if perfectly bright, and not exposed to variations of humidity in the atmosphere, it will last and take a share of the load. That is to say, it is generally assumed that a 9in. by 3in., showing one inch of bright sapwood at the edge, will be stronger than the 8in. by 3in., which would remain were the inch of sapwood removed.

So far as

Internal Joinery

is concerned in panels, mouldings, etc., where the element of strength is not important, the problem becomes largely one of appearance, or interference with decorative effect. The general practice of to-day tolerates the use of a limited proportion of bright sap for all but the very highest class of work. But very few specifying clauses contain any hint of permission for the inclusion of the smallest modicum. Here we have a difference between theory and practice which has frequently caused serious friction. Before leaving the point, let me warn all concerned against deals containing a certain kind of pink, soft, mellow-looking wood, the curve of whose annular rings shows that it was cut from a large and mature tree, and which is usually quite free from any suspicous of sap. It is over-ripe and decaying stuff, far inferior in strength to the youngest sapwood in the healthy tree.

Then What About Knots ?

The large dead knot is a source of weakness, but the live knot, firmly attached to the rings of living wood, may be regarded as playing its part in bearing stress. The small dead knot if its dimensions do not break into many of the annular rings, is a negligeable quantity so far as strength is concerned. Here again the question of disfigurement comes in, and only the class of work and the prominence of the piece of timber can determine what knots may be passed as permissible. As to centres, a sound centre is rarely objected to if completely boxed in by the surrounding wood, and is, of course, inevitably passed in the case of very large carcassing stuff. Referring to shakes, the extent and effect of any divisions in the fibres of a piece of timber are so variable as to prevent any laying down of hard and fast rules on paper respecting them, cross shakes, of course, being regarded as completely outside the pale under any circumstances. Their injurious effect depends upon their length, depth, width, and continuity. The inevitable shrinkage caused by seasoning must effect division here or there in the rings of any large scantling, and only personal examination of the piece itself, and a knowledge of the use for which it is intended can determine whether a shake is injurious.

Suggested Workable Clauses.

Putting all these considerations together, I suggest the following as workable clauses for the regulation of joiners' and carpenters' timber. Seeing that there are so many clauses of work, I should welcome any suggestion from the profession as to the provision of two or more alternative clauses, for use in accordance with the level of practical excellence required or the pecuniary resources of the individual or institution for whom the work is done:—Wood for carcassing or carpentry shall be sawn out of sound, bright, square-edged Baltic or White Sea planks, deals and battens, or Danzig fir, pitch, Oregon, or British Columbian pine of similar quality. The wood for joinery to be Baltic or White Sea yellow, equal in quality to the best Russian or Swedish shipments. All to be free from injurious open shakes, large, loose, or dead knots, or more than a small proportion of perfectly bright sap, and thoroughly seasoned.

FIRE-RESISTING CONSTRUCTION SECTION.

(MONTHLY.)

AN INEXPENSIVE FIRE-RESISTING HOSPITAL.

The King Edward VII. Hospital, Windsor, has been erected on high ground facing the Cavalry Barracks. The completed scheme provides for 100 beds, but only 40 are now being erected, besides a temporary children's ward for seven or eight cots, an out-patient department, an isolation block, and a mortuary. The main entrance is in the centre of the administration block. Opposite the front door is the entrance to the board-room, which is divided from the entrance-hall by a removable screen partition, so that, on the occasion of entertainments, the board-room and the hall can be thrown into one large room. A central corridor runs right and left of the hall, giving access to lift, matron's and secretary's rooms, and to the temporary children's ward. It is hoped before very long sufficient money will be given to enable the children's wing to be built, but for the moment the end of the administration block is being used. On the right are the resident medical officer's and the dispenser's room, also two casualty-rooms, with outside entrance, as receiving-rooms for accidents; then a passage-way giving access to the ward for twenty beds, with a good balcony at the end. Cut off, but easily accessible, is the out-patient department, with the physicians' and surgeons' rooms to right and left of the waiting-hall. The mortuary and isolation blocks are detached from the main blocks. On the first floor are the operating theatre, anæsthetic-room, sterilising-room, etc., nurses' dining and sitting rooms, and another ward for twenty beds. The kitchens, sculleries, etc., are on the top floor, with a separate staircase from outside, and two lifts for food, etc. A portion of the ground has been excavated for boilers, workshops, linen-sorting, etc. The work was commenced in December of 1907, and the hospital was ready for occupation in October. The buildings are constructed on the Frazzi system with steel framework, the building by-laws of the district having been altered by special permission of the Local Government Board to permit of this method of building. It is the same as that used at the National Sanatorium at Benenden, in Kent, designed by the same architect, Mr. A. William West, of Lyall Street, S.W., the cost being about half of what it would have been if executed in brickwork in the usual way. The important features of the Frazzi system of construction consist in the use of a steel frame of considerably lighter design than that usually adopted in "Skeleton" construction, and in the building of the external walls with Frazzi hollow terra-cotta slabs of only 3ins. in thickness, which not only are satisfactory from all hygienic points of view, but form rigid walls of great strength, capable of carrying weight. They are at the same time less than one-tenth the weight of a 14in. brick wall. The slabs are rough cast externally and plastered internally, forming walls of a total thickness of 4¼ins. only, and their heat conductivity is immensely less than that of concrete. All the internal partitions and many of the floors are also formed of Frazzi slabs, and the construction chimneys and ventilating flues is carried out with Frazzi casing and fireclay flue linings. The erection was carried out by the Frazzi Fireproof Construction, Ltd., of Essex Wharf, Whitechapel, E., the builders' work (joinery, framing, fittings, etc.) being done by local contractors.

REINFORCED CONCRETE CONSTRUCTION: DESIGN, QUANTITIES AND PRACTICE.

By Moritz Kahn.

Short abstract of a paper read at a general meeting of the Quantity Surveyors' Association, on April 28th.

Of late the use of reinforced concrete has become so extensive in building construction that quantity surveyors should have a general knowledge of the subject, if indeed not a specialist one.

The objects of this paper are, first to induce discussion on the principles of reinforced concrete construction, and, secondly, to indicate the method of measuring and pricing this type of work.

Comparative Costs.

It is erroneous to say that reinforced concrete will always prove the cheapest method of construction. There are instances where it is not so cheap. Middle-sized and small residential buildings, small manufacturing buildings, and the ordinary one-storey type of building will show very little saving when reinforced concrete is used in their construction. A low retaining wall 6ft. high would be cheaper in brick than in reinforced concrete, inasmuch as it would require a comparatively thin brick wall to withstand the strain; but a retaining wall over 10ft. high could easily be constructed in reinforced concrete cheaper than in brick. Isolated girders and roof trusses high in the air will invariably prove cheaper in steel than in reinforced concrete; but a steel structure, after having been built, will always require a certain amount of upkeep, and the maintenance charges thus entailed will have considerable influence on the total cost. In brief, though the material under discussion may not always be the cheapest in first cost, it is generally the most economical when all things are taken into consideration, such as the additional safeguard against fires, with a corresponding efficiency in one's plant, the saving in fire insurance premiums, and the reduction in maintenance charges.

Materials and Transit.

One of the reasons for the popularity of reinforced concrete lies in the fact that the constituents from which it is made can easily be obtained in almost any locality. In every part of England there are cement mills, and it is never necessary to look far for sand and crushed stone or ballast. These materials being found near the site produce a considerable decrease in the freight charges of building materials. The only remaining constituent which need be brought any distance is the reinforcing steel; this, however, will only be about 20 per cent. of the weight of material required in an ordinary steel structure, and the freight will be correspondingly reduced.

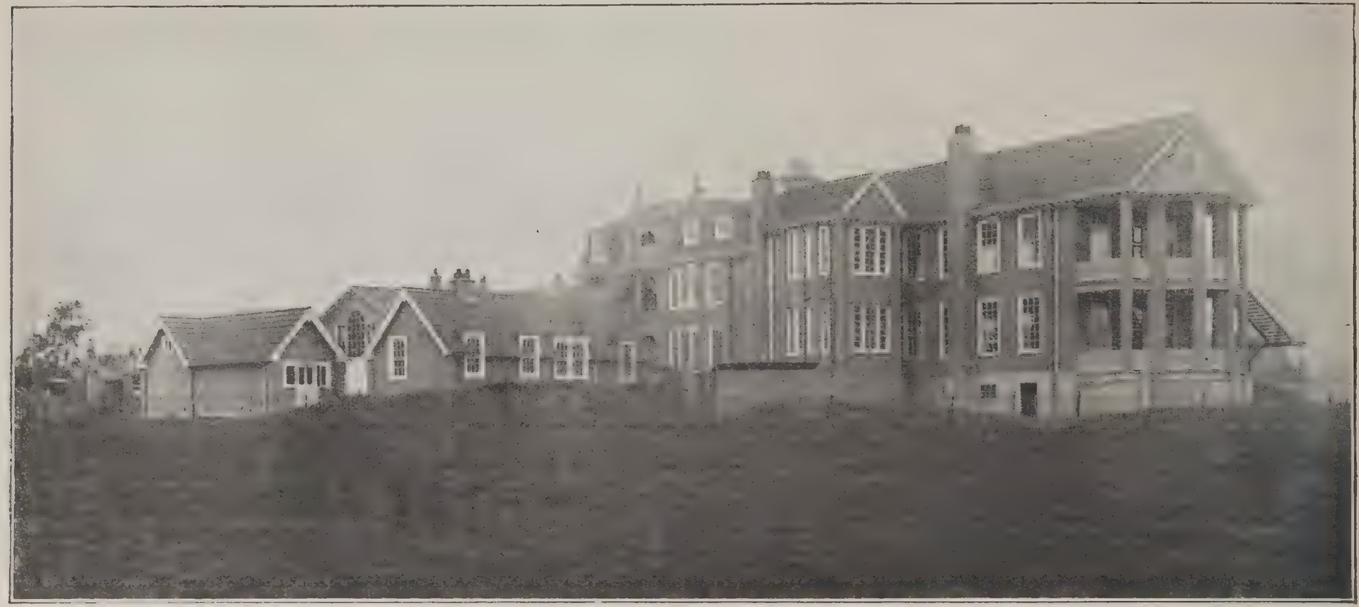
In the

Selection of Materials

the question is often asked whether preference should be given to crushed stone or ballast. Engineers are wont to object to the use of the latter, on the ground that the surfaces are generally round and too smooth. It has often been demonstrated that round, smooth ballast gives just as strong a concrete as crushed stone. This statement might be

KING EDWARD VII HOSPITAL
AND
DISPENSARY FOR WINDSOR, ETON AND DISTRICT
PRESIDENT H.R.H. PRINCE CHRISTIAN OF SCHLESWIG HOLSTEIN
FRAZZI SYSTEM

THE KING EDWARD VII. HOSPITAL, WINDSOR. A. WILLIAM WEST, ARCHITECT.



THE KING EDWARD VII. HOSPITAL, WINDSOR. VIEW OF THE BIG WARD BLOCK. A. WILLIAM WEST, ARCHITECT.

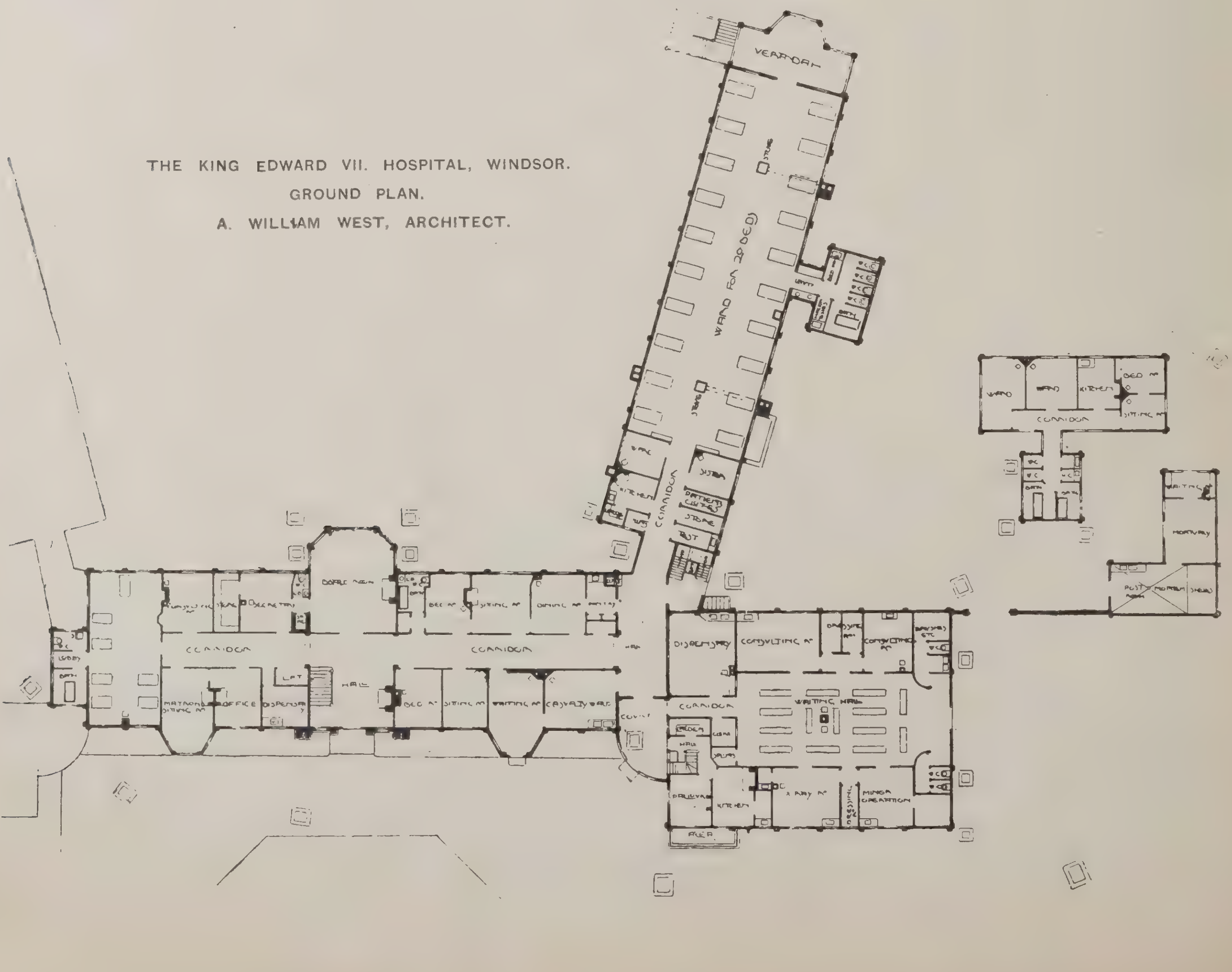
qualified by the fact that in the early stages, say at the end of two weeks, crushed stone concrete will be found to be a little stronger than ballast concrete, but at the end of 30 days ballast concrete is just as strong as stone concrete, and from that time on its strength begins to surpass it.

Ballast as a Fire-resisting Material.

Ballast is often considered unsatisfactory as a fire-resisting material. At a fire test made recently, it was found that ballast concrete would not stand the ordeal, but the ballast used in that test was uncrushed, and portions of it were of considerable size. Large stones when heated to a certain temperature will burst, owing to the internal strains exerted therein, but small stones heated to the same degree will not disintegrate. If the ballast used in that test had either been crushed, or screened to pass a ¾in. mesh, the floor slab in question would have successfully withstood the test. A similar test was made by the author for the New York City Fire Department in 1904, using crushed ballast concrete, with satisfactory results.

Mixing, Hand and Machine.

The use of a good batch machine mixer is advisable on every large construction. When the concrete is mixed by hand it is turned from six to eight times, but a machine mixer turns it at least twenty times in a much shorter period, and at a considerable saving in expense. In truth, a good machine mixer should actually be specified, provided the size of the construction and amount of concrete to be mixed warrant the expense of installing such a plant. In general, it will be found that in all constructions involving a



THE KING EDWARD VII. HOSPITAL, WINDSOR.
GROUND PLAN.
A. WILLIAM WEST, ARCHITECT.

quantity less than 400 or 500 cub. yards the concrete will be more economically mixed by hand than by machine, but in larger constructions the reverse is true.

Stresses and Strains.

That concrete is incapable of resisting all the shearing strains, and all internal tensile strains resulting therefrom, is now generally recognised, and in proper designing provision is made for overcoming all internal strains, whether they occur at the end of a beam, in the web, or at the centre of the beam in the bottom flange.

Theory of Reinforcement.

In a beam uniformly loaded, the maximum tensile strain on the steel will occur at the centre of the span, where the bending moment is greatest. At the same time, the maximum shearing strains on such a beam will occur near the points of support. The ultimate resisting value for concrete to shear is about 300lb. per square inch, and if the total shearing strain on any plane exceeds 300 times the area of that plane failure is bound to occur therein. Concrete being weak in tension, the various particles will fail in directions parallel to the lines of principal tensile stress, and the plane formed by the failure of these particles will be in the lines of principal compressive stress. Reinforcement could be adopted, which would embody small rods curving along the lines of principal tensile stress. A beam thus reinforced would be constructed with a minimum amount of material for the maximum strength, but such a system of reinforcement would necessitate the use of a multitude of small rods.

Measurement and Pricing.

Having given a brief account of the principles underlying reinforced concrete construction, and having described the Hennebique, Coignet, and Kahn systems, the lecturer passed on to the subject of measurement and pricing. The quantities of a reinforced concrete construction should be taken out in considerable detail. The cost of concrete in different portions of the structure varies considerably, and it is therefore desirable to know the yardage of concrete separately in footings, foundations, walls, columns, beams, girders, decking slab, and so forth.

The Cost of Centering

varies in a similar manner. This should be measured up separately by the superficial area of the surface coming in contact with the concrete, namely, for walls, columns, beams, girders, decking slab, and so forth. Thus, walls are measured both sides, without deducting doors and windows, as it is usual to let the form work run straight across these, unless it is impossible on account of mouldings, in which case the framing of the opening will cost as much as the form work omitted. Columns and beams should be measured by their girth, and decking slab by the horizontal measurements. No deductions should be made for the loss of area by the intersection of beams and girders, and small openings in the floor should not be deducted. Anything as large as an elevator or staircase opening is usually deducted.

Extra labour involved in belt courses, moulding, cornices, and so forth, should be measured by the lineal foot, giving the girth of same. All special features of exterior treatment should be carefully noted.

The steelwork should be taken off in lbs., and again, the amounts used in the various constructions should be kept separately.

The Question of Finish.

The greatest source of contention in reinforced concrete construction lies in the question of finish of the work, and therefore great care should be taken to specify the kind of finish required, and accurately measure to the surface area of the various kinds. If no particular finish is included in the contract for the reinforced concrete work, there should be a clause to the effect that all such work is to be left free from the centring. The upper surface of floors can either have a granolithic finish, screeded surface, or surface left from the spade. If either of the first two is required, the yardage should be measured. There is, of course, no extra charge for leaving the floors with a spade finish.

(To be concluded.)

R.I.B.A. EXAMINATIONS.

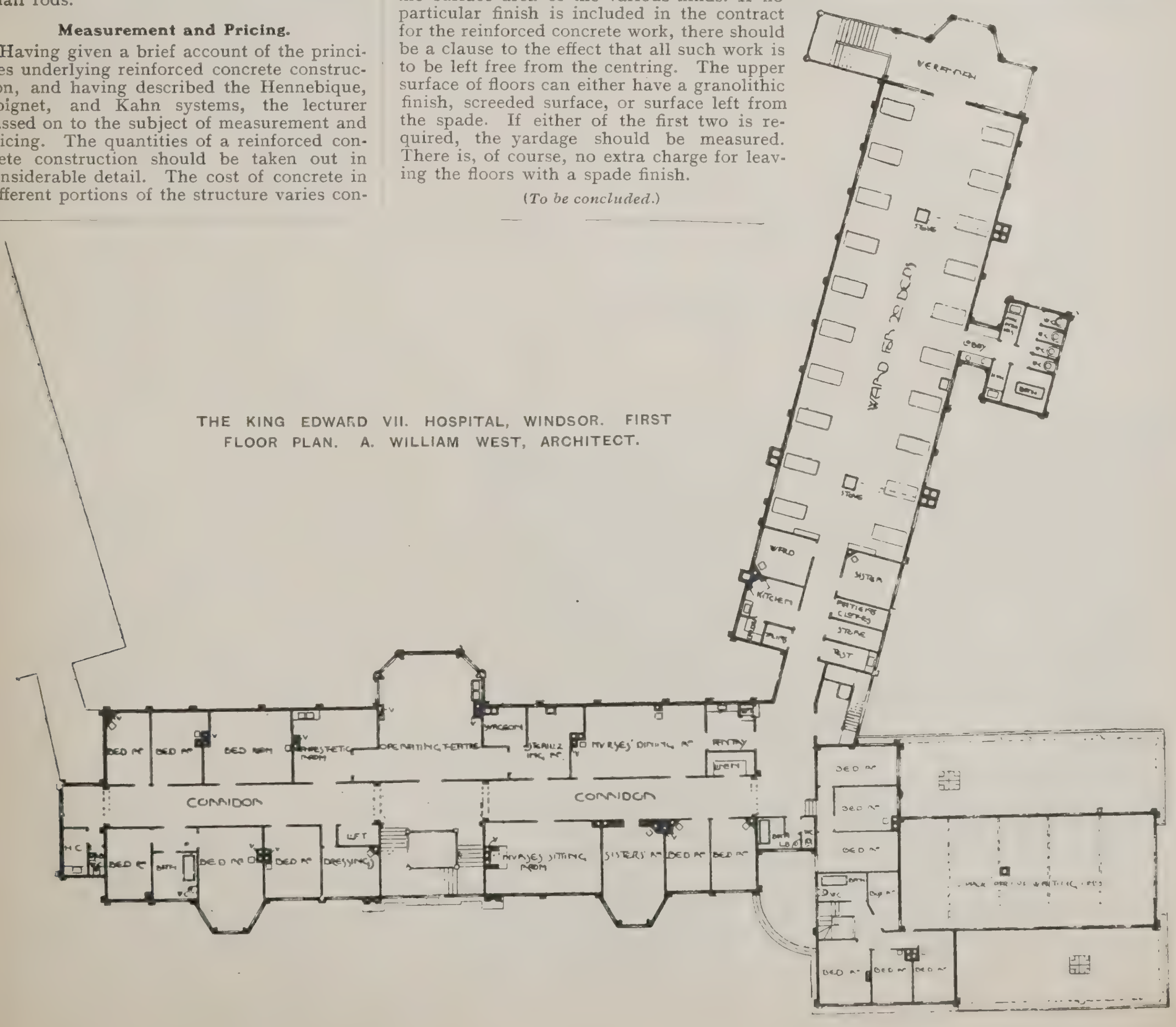
The report of the R.I.B.A. Board of Education includes a statement to the effect that the following modifications in the intermediate and final examinations will come into operation this year:—

The Intermediate.—The following specific subjects will be omitted from this examination in future:—1, Classic Ornament. 2, the Characteristic Mouldings and Ornament of each Period of English Architecture. from A.D. 1000 to 1550, with their application. 3, the Orders of Greek and Roman Architecture; their Origin, Development, and Application. 4, Outlines of the History of Mediæval and Renaissance Architecture in Europe.

Instead of the above, two papers will be set on (1) the General History of Architecture; and (2) the Purpose of Architectural Features in Relation to Buildings in which they occur. Answers to be accompanied by explanatory sketches.

The Final and Special.—The following specific subjects will be omitted from the examinations in future:—Subject II., the Principal Styles of Architecture: their Features, Mouldings, and Ornament. (1), the Characteristic Mouldings, etc., of the Special style selected by the student; (2), the Characteristic Mouldings, etc., of the Principal Styles of Architecture.

Instead of the above the following papers will be set:—*Morning*—The Principles of Architecture: their Theory and Application. Illustrated by drawings, *Afternoon*—A written thesis. Illustrated by sketches.



THE KING EDWARD VII. HOSPITAL, WINDSOR. FIRST FLOOR PLAN. A. WILLIAM WEST, ARCHITECT.

THE KING EDWARD VII. HOSPITAL, WINDSOR. VIEW FROM THE REAR. A. WILLIAM WEST, ARCHITECT.

The amended report of the diploma in Architecture Syndicate at Cambridge University was considered by a committee of the Board, who suggested certain modifications therein, and on the recommendation of the Board, the Council of the Institute forwarded the said suggestions to the Syndicate.

TESTS AT THE KLEINE EXHIBIT, OLYMPIA.

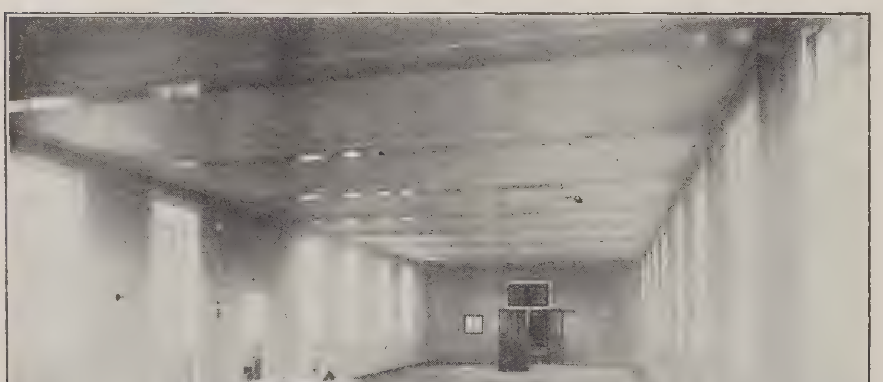
On Monday, the 3rd May, before breaking up their exhibit at the Building Exhibition, The Kleine Patent Fire Resisting Flooring Syndicate, Limited, gave an interesting demonstration showing the effect of heavy loads falling from a height on their floor.

As the floor in question had only been constructed twenty days and had not attained its full strength, and, moreover, was of a very light type, the object of the demonstration was not to show under what load the floor would remain unbroken, but was to show the effect of a heavy weight falling on to, or through, the floor. A stone weighing 90lbs. was dropped from a height of 10ft. in to the centre of the floor measuring 20ft. by 12ft.—the clear span between girders being the latter dimension. After repeated falls on the same spot—about 15ins. square—a hole was knocked through the floor, the stone remaining suspended on the tension bands. Similarly, a round iron shot weighing 30lbs. was dropped from a height of 18ft. on another part of the floor, the effect being much the same as in the case of the falling stone.

Against the side of the floor, consisting of one of the 9 by 4 girders into which the floor was built, a fine glass measuring tube was placed, between an upright wooden support, so that the least thrust or pressure on the steelwork would break the glass. There was also an ordinary hen's egg laid on the concrete surface of the floor a few feet from the spot on which the large stone was dropped, so that the least vibration would crack the egg.

On examining the structure after the test it was found that every portion of the floor except the small spaces on which the weights had fallen, was quite unharmed, and neither the glass tube nor the shell of the egg showed any fracture. It was thus proved to the entire satisfaction of the architects, engineers, and other gentlemen who were present at the demonstration, that even under great shocks from heavy loads falling through a Kleine floor, no harm would be done to any part of the building except the actual small area of floor on which the load had fallen. Particularly noteworthy was the absolute cohesion of the cement mortar joints in which the iron tension bands are embedded.

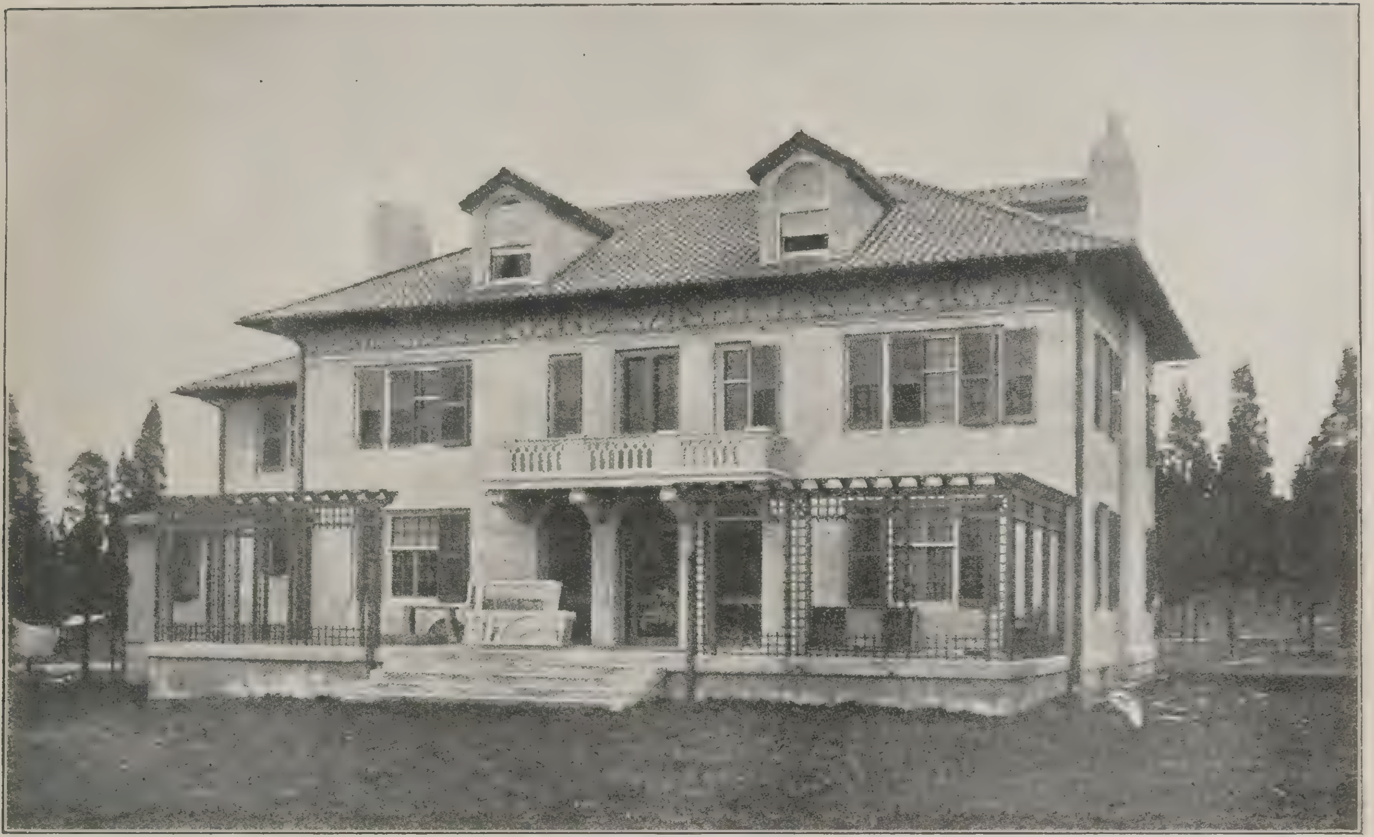
Although comparatively green after twenty days, not a sign of severance or loosening of the joints was to be seen anywhere, even in close proximity to those parts of the floor on which the weights had fallen.



THE KING EDWARD VII. HOSPITAL, WINDSOR, INTERIOR FIRST FLOOR WARD. A. WILLIAM WEST, ARCHITECT.

FIREPROOFING THE DWELLING.

A writer in the "Architectural Record," of New York—Mr. A. C. David—passes in philosophical review the causes that have led up to "The Advent of the Fireproofed Dwelling" in America, where people are beginning to prefer a well-made and non-inflammable house to one that is ill-built and at the mercy of every occasional fire. His article heralds the hollow-tile system of construction, which has sprung into sudden popularity in America, and is by no means unfamiliar in our own country. The cheap dwelling is going out of fashion. While the country was still young and growing rapidly, and economic conditions were swiftly changing, the American had no regard for permanency in his buildings. When as yet social conditions were fluctuating, he could not feel sure that he would continue long in the same city and in the same habits, and he felt still less assurance that his heirs would succeed to any fixed set of conditions. He built for present and pressing needs, and took no thought for the morrow. The insurance bills and the fire losses were enormous; but it would have been hazardous to build more substantial structures that might speedily lose their economic value through incalculable developments, and their æsthetic interest by the growth of taste. This unsettlement naturally affected business buildings, as well as dwellings. But it did not long outlast the construction of the railways, whose routes determined the sites of cities, and whose structures set an example of more substantial methods of building. Greater social and industrial stability led to greater stability in the building.



FIRE-RESISTING HOUSE, CEDARHURST, LONG ISLAND, U.S.A. LOUIS BOYNTON, ARCHITECT.

The "Skyscraper" Stimulates Fireproofing

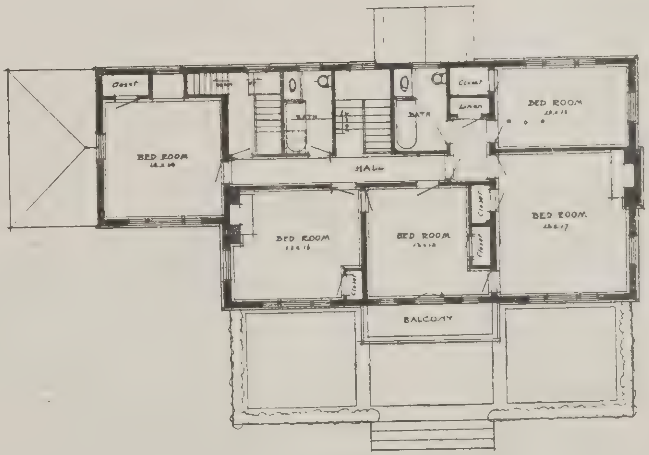
The much-abused skyscraper turned men's minds to the very earnest consideration of means and methods of fireproofing. These tall buildings being so enormously expensive, it became necessary that they should be rendered as far as possible non-inflammable. For this and for other reasons the substantial fireproof building is becoming for the American business man the economical form of construction.

Domestic Fireproofing.

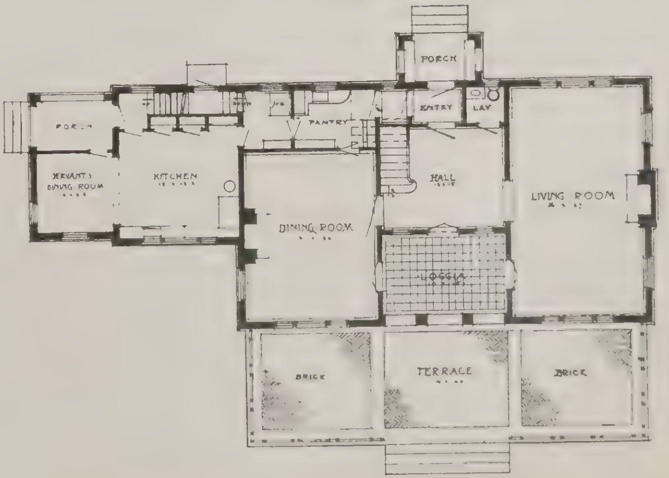
In the domestic buildings of America, as in those of Great Britain and elsewhere, too little consideration is given to fireproofing precautions. In the instances in which this point has been studied, the motive has usually been the safeguarding of rare furniture, pictures, and similar treasures. Still, the number of wealthy Americans who, while they could abundantly afford to have their houses as nearly perfect as science and art can make them, prefer to have cheap dwellings, "which are not even of slow-burning construction," is extraordinarily large.

Timber Dwindles.

A change of view, however, has been, during the past few years, plainly observable. In part it has been compulsory. Timber of all kinds has grown rapidly more scarce and more costly; so that the difference in cost between the old-style timber-constructed dwelling and the up-to-date fire-resisting structure is rapidly losing its force as a dominating factor in the choice of system. "Of course," says Mr. David, "a wooden house still remains the type of building whose initial expense is least burdensome; but in certain cases a man could figure that a fire-proofed building might be actually cheaper in the end. He could figure that in the course of a decade he would save enough in the cost of insurance, in the cost of repairs, and in the absence of deterioration, more than to compensate him for the larger initial expense. The consequence is that of late year a number of small fireproofed dwellings have been erected, costing from 5,000 to 15,000 dollars; and the number is constantly increasing."



SECOND FLOOR PLAN



FIRST FLOOR PLAN

FIRE-RESISTING HOUSE, CEDARHURST, LONG ISLAND, U.S.A.
LOUIS BOYNTON, ARCHITECT.

HOVSE FOR MR E A GIBBONS
BOGOTA N.J.

FIRE-RESISTING HOUSE, BOGOTA, NEW JERSEY, U.S.A.
SQUIRES AND WAYNKOOP, ARCHITECTS.

A By-product of the Fireproofing Industry.

This extension of fireproofing methods to small houses is explained as being a sort of by-product of the fireproofing industry. "The enormous demand during periods of business prosperity and expansion has resulted in the building of vast plants for the manufacture of the different kinds of fireproofing materials—in particular, such materials as hollow tile and cement. These plants are employed to the limit of their productivity as long as business is active; but during a period of inactivity their owners are in very much the same situation as the owners of a steel-rail plant. They find it very hard, under such circumstances, to keep their machinery working; and they have naturally been seeking some source of consumption which might prove to be more permanent. The only possible source of a more continuous demand is that which might be developed among the builders of residences. Of course, the number of dwellings erected in a prosperous period is larger than the number erected during a period of business depression; but the population of the country increases steadily, and the variations in the demand for the materials entering into residence construction are slighter than those entering into the construction of large business buildings. The tile and cement manufacturers have, consequently, been willing to make sacrifices and to spend money in order to increase the use of fireproofing materials in domestic building; and their efforts have been attended with a certain measure of success.

All over the country

Hollow-tile and Cement Houses

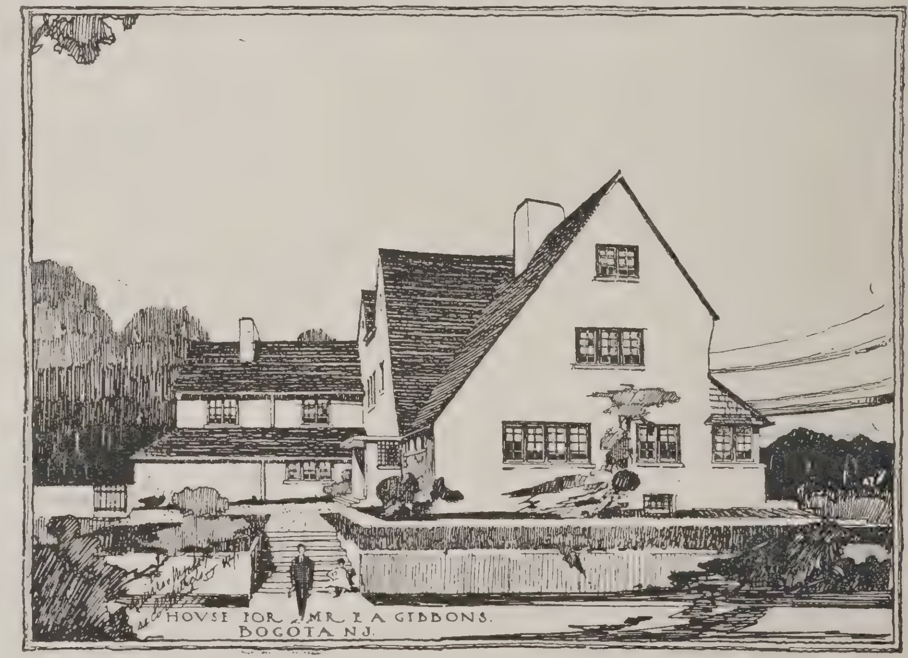
are being erected in larger numbers than ever before, and the movement has only begun. There can be no doubt that the small as well as the large fire-resisting dwelling is destined to become a common type of building." It would be vain to speculate whether or not we in this country are likely to follow America's example with regard to the smaller buildings as readily as we have followed it with respect to the larger. At present the by-laws are prohibitive; but they are not likely to remain perpetually in force; but we are inclined to think that, even were this barrier removed, the old system of construction would still remain in favour, and would not be likely to see very radical changes.

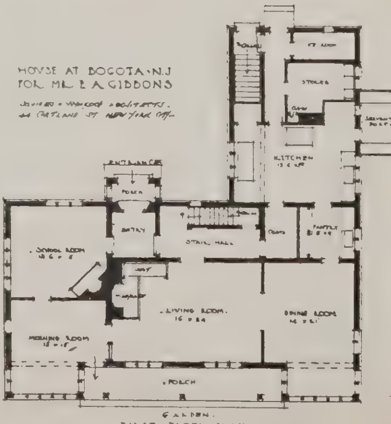
Origin of Hollow-tiled Houses.

The hollow-tiled houses that have recently become so popular in America call for serious consideration. Hollow tile was, says Mr. David, manufactured originally for the purpose of affording protection for the steel framework of a modern skyscraper. Its use in ordinary construction is quite recent. It is easily and economically laid, and affords a rough surface to which plaster will adhere without the assistance of lathing. But, the larger the house, the greater the necessity for inserting cement beams and piers; and even in small houses hollow-tile construction involves the use of a good deal of cement. Nevertheless, the use of tile for the walls, and to a smaller extent for the floors of dwellings, has been an immense advantage to the cause of fire-resisting construction. "It has made possible," says Mr. David, "the partial or complete fireproofing of many residences which for one reason or another could not have been built of concrete. It involves a simple but sound method of construction, which can easily be mastered by the ordinary builder; and while it demands a higher and more careful standard of workmanship than a frame house, it does not call for the same sort of expert knowledge as does thoroughly good cement construction; . . . and in course of time the method of construction it involves will become still further diversified, simplified, and cheapened."

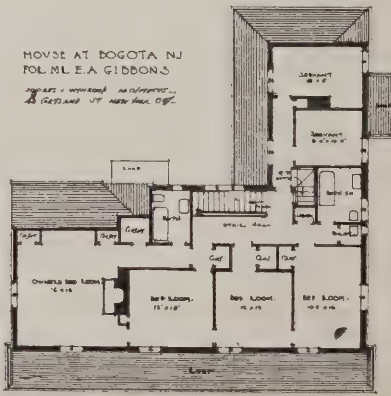
Structural Aspects of the New System.

The hollow-tiled house, then, is the fireproof dwelling whose advent Mr. David acclaims. His article is followed, in the same magazine, by Mr. H. W. Frohne's observations on "Some Structural Aspects of the Fireproofed Dwelling," in which the author begins at once with the admission that the hollow-tiled dwelling costs from ten to twenty-five per cent. more to build than a house of similar size built in the ordinary way. He points out, however, that whereas with the ordinary type of house the insurance rate is high, the life is short, and the cost of repairs is heavy, the hollow-tiled

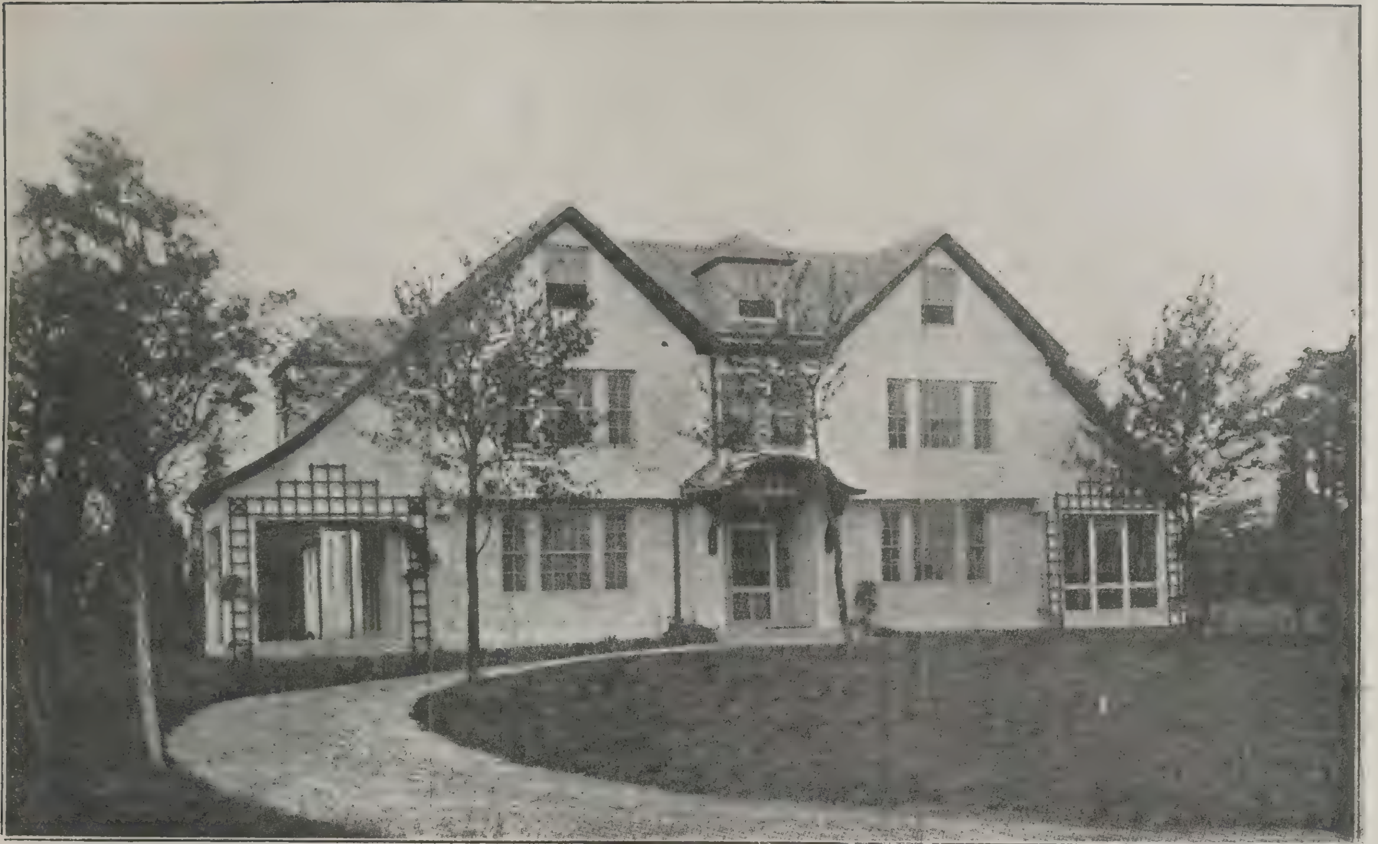

HOVSE FOR MR E A GIBBONS.
BOGOTA N.J.



FIRST FLOOR PLAN



SECOND FLOOR PLAN



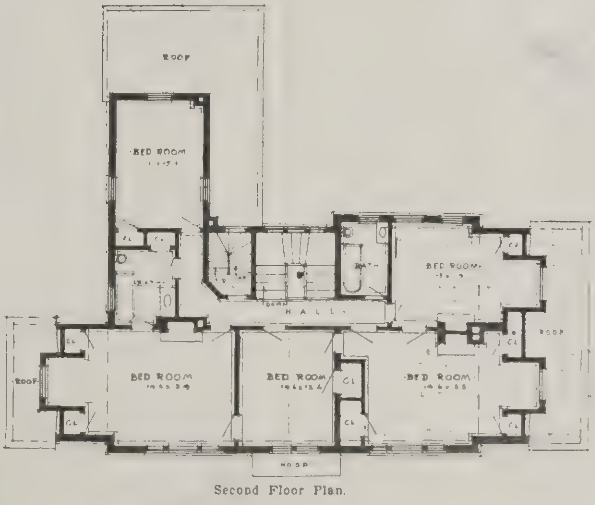
FIRE-RESISTING HOUSE (NO. 2) CEDARHURST, LONG ISLAND, U.S.A. — LOUIS BOYNTON, ARCHITECT.

would hardly need to be insured at all,' is practically everlasting, and costs little or nothing for maintenance in good repair.

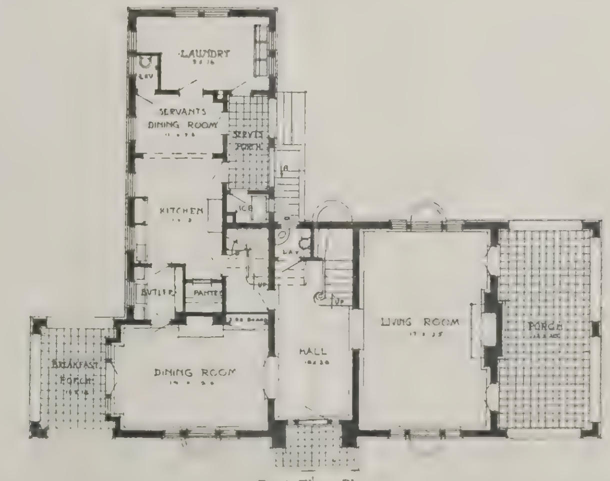
The Method of Construction.

Mr. Frohne illustrates a number of hollow-tiled houses, of which three examples are here shown; and he thus explains the method of construction: "Rows of hollow-tile, with alternating beams of concrete, containing at the bottom one or sometimes two very slender steel rods (generally one ⅜in., ½in., or ⅝in. rod in each beam is necessary), form the floors, while the hollow tiles, laid in Portland cement, constitute the walls; thinner hollow tile blocks, similarly laid, serve as the interior dividing walls or partitions. Under ordinary conditions the floors and walls are built of the same size tiles. These tiles are burned under a temperature of about 2,500 degrees Fahr. Those most commonly used in walls are about 8ins. deep, 12ins. wide, and 12ins. high, and, on experimental tests, have been found to possess a crushing strength along their height of more than 3,200lb. to the square inch of material in the cross-section, which allows for a very generous factor of safety in the walls and floors where they are used. Walls and floors so built are accordingly 8ins. thick, in addition to the thickness, in the case of walls, of half an inch of plaster for the inside, and an inch or more of cement for outside protection from the weather. The floors are then plastered on the under side with about half an inch of plaster, as is the inside of the walls; and the upper side of the floor may be treated as preferred."

The cost of roof construction for the fire-proof dwelling is admittedly heavy, as it may involve the use of reinforced concrete rafters; and of course the ordinary roof is not highly fire-resisting. But the roof problem is engaging the earnest attention of inventive brains, and its solution is probably only a question of time. The future of the system depends largely on the degree to which its cost can be reduced. It is quite possible that in this respect the experts in hollow tile construction who are already doing a brisk business in our own country may be able to show our American cousins a good lead.



Second Floor Plan.



First Floor Plan

FIRE-RESISTING HOUSE (NO. 2) CEDARHURST, LONG ISLAND, U.S.A. LOUIS BOYNTON ARCHITECT

BRITISH URALITE CO.'S FIRE-RESISTING PRODUCTS.

By invitation of the British Uralite Co., Ltd., a representative of this journal visited their works at Higham, Kent, on Wednesday last, when a party of Royal Engineers, about thirty in number, were conducted round the works, and had the various processes explained to them by Mr. C. R. Hoare (chairman), Mr. Davidson (managing director), and various heads of departments.

The basis of the British Uralite Company's products is asbestos. This, it was explained, is a mineral fibre composed of neutral and practically infusible silicates of lime and magnesia. Glossy as silk, and often as finely fibrous, this mineral can yet resist the attacks of extremely high temperatures, and show not the least sign of fusion or any other kind of damage. Nor is it affected by the strongest acids.

It was a Russian engineer officer who, perceiving how useful a building material could be made from asbestos, hit upon the happy idea of adapting millboard-making machinery to the manufacture of sheets of asbestos. Much of the plant, therefore, is reminiscent of the paper-mill. The asbestos, like the raw material for paper-making, has first to be freed, by means of an air-blast process, from all traces of rock and other foreign matter. It is then placed in a "beating and mixing engine," in which it is disintegrated and beaten to a sludge. The sludge or pulp is fed into a receiving trough at one end of the modified type of millboard-making machine, and, carried along an "endless" webbing, under and over several cylinders, it at last emerges in the form of a limp and plastic asbestos sheet. The material has taken shape and substance, but it is not yet Uralite. It must pass through many processes, from which it must finally emerge rigid and flawless.

The machine can produce 700 sheets of Uralite, 6ft. by 3ft., ⅛in. thick, in eight hours; but the finished product will not be allowed to leave the works until it has matured for six months. The sheets, after undergoing a series of elaborately graded stoving operations, are steeped alternately in solutions of sodium silicate and calcium chloride, with the effect that silicate of lime is deposited in the interstices of the fibres, stiffening the material into a rigid sheet, while approximating, chemically to the composition of the asbestos itself. Uralite is therefore, it will be seen, a purely mineral material, of homogeneous composition, and therefore not subject to decay, fibrous in structure, and therefore tough and strong, and, in its nature and essence, eminently fire-resisting.

Uralite is in no way affected by gases, acid fumes, or damp, and has therefore been adopted in chemical and explosive works, foundries, breweries, and similar buildings, as well as in hospitals, where its hygienic character is well recognised. Messrs. Reckitt and Sons, Ltd., the starch, blue, and blacklead manufacturers, have fitted a large quanitity of Uralite for the ceilings, etc., of the new packing-rooms at their Hull works, in full confidence that it will prove here (as it has proved in recorded instances) an effective means of confining any fire within the limits of the room in which it may happen to start; and with the same object, they have lined staircases and goods hoists with this material.

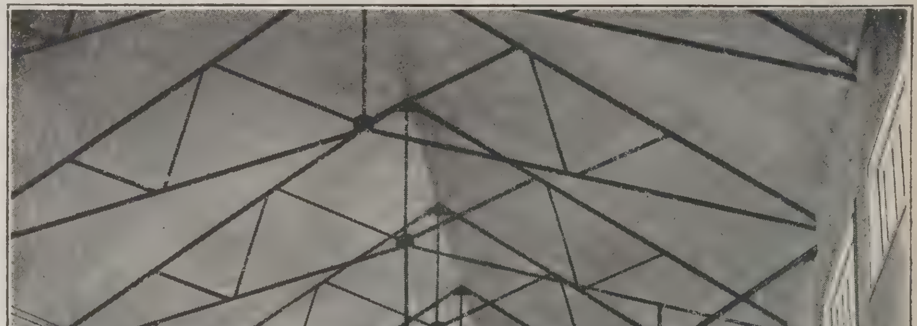
Large malt-kilns at Burton-on-Trent, Dublin, Glasgow, and elsewhere, have been lined with Uralite, which not only reduces the fire risk to a minimum, but prevents condensation, and is proof against sulphur fumes.

Uralite roofing has been used in all parts of the world, its lightness (1lb. to the square foot) and its immunity from breakage rendering it an ideal material for shipment and general conveyance, while its resistance to heat, its non-conductivity, and defiance of the ravages of insects make it peculiarly suitable for the tropics. It is manufactured in large sheets (up to 6ft. by 3ft.) for use on the Colonial system; also in large or small diamond tiles; and in most of the usual slate sizes.

The Uralite fireproof doors, of which two illustrations are here given, are, however, of three several types. The warehouse door is built up of two thicknesses of wood (cross-grained), with one thickness of Uralite between, and both faces and all edges covered with two thicknesses of Uralite. The armoured door is similar in construction to the ordinary armoured door, with the important addition of a layer of Uralite between the wood foundation and the steel sheeting. The door designated "Uralite ordinary" has panels formed of a double thickness of Uralite; the whole area of the door, including the edges, being similarly protected. The warehouse door has successfully undergone a severe test by the British Fire Prevention Committee, who reported that, although a temperature of 1,780 degs. Fahr. had been reached, "the outer thickness of Uralite was not damaged." Doors protected with this material form part of the company's fire-testing hut at their works, and have endured unscathed many a fierce fire. At a test in this hut on Wednesday last, a wooden box lined with Uralite was kept in a fierce flame for half an hour, and yet its contents—sulphur, paraffin wax, and thin lead, a sheet of paper, and a cotton handkerchief—were in no way affected.

Uralite Asbestone, an improved form of asbestos cement sheet, manufactured by the British Uralite Co., is also an excellent fire-resisting material. It may be used for outside walls, as well as for interior partitions, ceilings, roofing, etc.; and, like Uralite, it is easily and rapidly fixed, is light and durable, and can be painted or papered immediately after erection. The firm's London offices are at 16, St. Helen's Place, E.C.

THE WAREHOUSE AND THE ORDINARY TYPES OF URALITE FIRE-RESISTING DOORS.


BALLOON SHED AT THE ARMY BALLOON FACTORY, ALDERSHOT. LINED WITH URALITE SHEETS.

Federation News.

BRISTOL ASSOCIATION.

Secretary: A. J. Pitt.

The Bristol Association annual dinner was held on March 30th at the Royal Hotel, under the presidency of Mr. Frank N. Cowlin, who had the pleasure of seeing nearly 100 present, including Mr. E. J. Brown (president of the National Federation), Alderman H. W. Twiggs (chairman of the Bristol Docks Committee), Mr. F. Chown (vice-president of the Bristol Association), Mr. Mowbray A. Green (president of the Bristol Society of Architects), etc., etc.

Mr. Charles Long (Bath) proposed the toast of "The City and Port of Bristol."

Alderman H. W. Twiggs, in replying, said that while the building trade had to deplore depression in their industry, he thought that the Dock Committee had done something to help them in the spending of the large sums of money they had on construction works during the past seven years. He was delighted to know that members of their own trade, not content with carrying on their operations at home, had gone across the seas, and he was glad to know that their president was now engaged in carrying out a very big contract in Jamaica.

Councillor G. H. Oatley also responded to the toast.

Mr. G. H. Perrin, in proposing the toast of "The National Federation of Building Trade Employers of Great Britain and Ireland," said that perhaps he owed the honour to the fact that he had for some time past taken a prominent part in the work of the associations connected with the timber trade, and having held the office of vice-president of the Timber Trade Federation of the United Kingdom. The National Federation of Building Trade Employers, he noted, represented a most important industry, which employed, with one exception, more labour than any other industry in the land. He understood that the Federation was subdivided into no fewer than thirteen sections; and he observed, in the list of their hon. vice-presidents, honoured names in the trade. Their organisation he looked upon as excellent and practically perfect so far as it went, but there was room for expansion. In glancing over their annual report he was struck with the multiplicity of subjects that had engaged the attention of the Council of their Federation. The union was one of strength and of inestimable value, in his judgment, not only to themselves as masters, but for the benefit of the vast number of employees engaged in the trade. It was apparent to anyone that without such an organisation as theirs, many wild schemes would be thrust upon individual members of their trade and districts that would materially damage both masters and men; but with such knowledge and influence as they possessed in the Federation they were able to repel such attacks. It was distressing to learn that there were not enough apprentices being made for future requirements of many sections of their business—masons, bricklayers, slaters, tilers, plasterers and painters. He was glad to note that carpenters and joiners were not included in this category; but the wood was wanted after the bricks and mortar. What were the youths of to-day doing? He feared they all knew too well that they were sportsmen first, and not workers and patriots, as they ought to be. Their Council had worked against the Eight Hours Bill, and they expressed regret that party consideration of votes had been placed higher than that of the industrial welfare and prosperity of the nation. He noticed that the fair-wage clauses in contracts had received attention by their Council, owing to the activity of labour representatives on public bodies. He also observed that they were making efforts to secure the adoption of the Federation form of contract, but he was sorry that the R.I.B.A. did not see their way to support it.

The President, in reply, said he was sorry that Mr. White, their excellent National Secretary, was unable to be present with them, for he had done splendid work for the Federation, and would be able to tell them something of what it had accomplished. He wished that such associations as Bristol could be distributed throughout the land, for there were parts in a terribly neglected condition, through the fault of those who lived in those districts. There were large builders who came to London and took advantage of the organisation there, and yet never contributed to their funds. That was a shame. If all the associations were as loyal as Bristol, the Federation would be a tremendous success, for Bristol was second to London only. They were glad that the relations between the masters and the workmen continued in a satisfactory state. The Conciliation Board had done good work although the decisions were sometimes against the employers. They, however, set their faces dead against the employees' view as regarded piecework, and they claimed to have a free hand in the matter. There was the question of the Anti-Sweating Bill which was being brought forward in Parliament. It was started with regard to the clothing industry, but there were proposals that it should apply to other trades in the country. It would be necessary for the Federation to watch carefully and see that their rights were not interfered with. The Federation had adopted an official organ, and he hoped that all members of the Federation would do everything in their power to support and recommend the journal, because from it they could and did reap benefit. They asked their friends the architects also to support the journal. He wanted all the members who had the power to influence advertisements to exercise it in favour of the journal.

Councillor A. Dowling, in proposing the toast of "Architects, Engineers, and Surveyors," spoke of the need of more attention being paid to the study of architecture, and a more liberal education in regard to it. If that were done there would be a bigger demand for better work, and they would have better buildings designed. That was a study where they could find much to appreciate, for they saw before them history re-enacted. In the profession of the architect there must be no make-believes, no make-shifts. He honestly believed that the shadow was behind them in regard to trade. There were indications within the last few months that they had seen the worst in connection with their trade, and in that revival the profession of architect was bound up.

Mr. Mowbray Green (president of the Bristol Society of Architects) and Councillor Frank Wills replied.

Mr. R. F. Read proposed the toast of "Kindred Associations."

Alderman J. Curle (president of the Bristol Trades Council), in reply, said for the last thirty years there had not been a serious dispute in the building trade in Bristol. He was glad that they got on so amicably, and with the Conciliation Board established, there were great hopes for the future. There was nothing to be gained by strikes, and he hoped they would get along without them in the future. He thought they could do so if they sat down and reasoned things out as they ought to do.

Mr. Henry Alsop (president of the Bristol Furnishers Chamber of Trade) also responded.

Mr. W. H. Brown proposed the toast of "The Bristol Master Builders' Association."

The President, in reply, said he was glad to say that their relations with the architects were far better than they had ever been before. They had a really good form of contract, and arbitration cases between architects and builders in Bristol were almost unknown. The employment of a professional quantity surveyor to take out the quantities and settle the accounts had contributed greatly to that happy result. The same happy condition of affairs reigned as regards their employees. They appreciated very much the presence of Mr. Curle, who represented the employees. He did not think that there had been a single dispute in the Bristol building trade. They had a set of working rules which were a model that had been accepted in many towns in the country.

EDINBURGH, LEITH, AND DISTRICT BUILDING TRADES ASSOCIATION.

Secretary: James Cameron.

The monthly meeting of the executive of the above association was held in the Building Trades Exchange, 61, Lothian Road, Edinburgh, on April 29th, when there was a good attendance of members, presided over by Mr. David Mekie, president, who was congratulated on his election to the Edinburgh School Board. After the minutes were read, reports on the state of trade were given which showed that there was a seasonable improvement, but trade generally was still very quiet. The only new job reported was the addition to the General Post Office.

As regards priced schedules being sent in along with the tenders, some further discussion took place, and the matter was ultimately remitted to the committee, who are meantime attending to the drawing up of a new constitution to see that a rule is incorporated in the constitution that no priced schedules are to be sent in along with offers in future.

A member stated that a firm of surveyors, in sending him a schedule, had inserted the rate per hour that he, the contractor, was to be allowed for days' jobbing work in connection with the contract. This is unusual, and the meeting strongly resented the innovation. The matter will come up again.

The Secretary gave a report on the half-yearly meeting of the Scottish Building Trades Federation, and the delegates attending along with him were thanked for their presence at that meeting.

A specimen of the telephone card proposed to be issued by the association was submitted by the secretary, who explained generally the lines that he purposed following, and the matter was left in his hands to carry out.

The annual excursion has been fixed to take place in June, and a committee was appointed to make the necessary arrangements.

Scottish Building Trades Federation.

The half-yearly meeting of the executive of the Scottish Building Trades Federation was held in the Royal British Hotel, Perth, on Friday, April 23rd. Delegates were present from Aberdeen, Dundee, Inverness, Kilmarnock, Perth, Edinburgh, and Leith, and Mr. James Leslie, builder, Aberdeen, presided. After the minutes had been read, a welcome was extended to the gentlemen attending from Perth, in whose district the local association is at a very low ebb. Reports on the state of trade were submitted by the secretary, from which it appeared that the building trade throughout Scotland is still in a depressed state.

The secretary reported that the Glasgow Employers' Council had not yet joined the Federation. The secretary, Mr. Cameron, was instructed to endeavour to attend a meeting of the Glasgow Employers' Council, and lay the claims of the Scottish Federation before that body.

At this stage the delegates from Perth spoke as to the conditions obtaining in their district. Mr. Robert Brand, junior, Perth, stated that it was practically useless to attempt to stir up interest amongst the local contractors at the present time, but he informed the meeting that before the winter months came, he along with one or two interested members would do all they could to have their association resuscitated, and asked that the Perth association's name might be retained on the list of the affiliated associations. This request was unanimously granted, and the chairman expressed the hope that Mr. Brand's expectations would be fully realised.

The proposal to adopt a National Crest was brought forward by the secretary, who submitted a sketch of a crest, which was unanimously approved, and will come up for confirmation at the annual meeting, which is to be held in Inverness on September 10th next.

The secretary was also instructed to bring forward a report as to the progress being made by the various associations who had adopted the intertrading rule.

EDINBURGH, LEITH, AND DISTRICT BUILDING TRADES ASSOCIATION.

Annual Report.

In submitting the thirty-seventh annual report of the Edinburgh, Leith, and District Association, regret was expressed that the past year had shown practically no improvement in the building trade. It is believed, however, that the works in connection with Rosyth Naval Base and the new barracks at Redford will tend to ease matters, and in the year 1909 an improvement in the state of trade is confidently looked for.

Notwithstanding the dull state of trade, the executive have found much to demand their attention. Thirty meetings were held during the year, and matters of much importance were dealt with. The executive meetings have been well attended throughout the year.

According to the constitution, the following gentlemen retire from the executive, and are not eligible for re-election until the expiry of one year, viz.: Messrs. Alexander Macdonald, James Millain, John M. Scott, and Charles Taylor.

A firm were threatened with legal proceedings by the Operative Joiners' Society on behalf of three of their members, who alleged that country money was due to them for working on a certain job. The whole facts were reported to the executive by the firm concerned; the executive decided that the position they had taken up in resisting the claim was quite justified, and they agreed to support the firm in any action that might be raised. The matter was placed in the hands of the secretary, and as a result of his intimation to the agents acting for the operatives' union, nothing further was heard of the claim.

In January, 1908, intimation was given to the operative bricklayers that the wages were to be reduced from 9½d. per hour to 9d. Two conferences were held between delegates from the operatives and the association, but nothing definite was settled, and, in face of the working agreement, the men went on strike. After being on strike for more than a month, they asked for another conference, which was granted, and at that meeting it was agreed to remit the matter to arbitration, as provided for under the rules. The arbiter mutually agreed on was Mr. W. T. Oldrieve, of H.M. Office of Works, before whom evidence was led from both sides. On June 8th he issued his award that the wages were to remain unaltered.

With respect to the masons, the relations between the employers and men remain unchanged. The wages throughout the year have remained at 8½d. per hour; and the wages of the plumbers have remained at the old rate of 9d. per hour.

Correspondence on the mode of measuring plumbers' work has passed during the year between the surveyors' society and the association secretary, but the surveyors have not, so far, intimated what they purpose doing in the matter.

The Edinburgh and Leith Corporations Gas Commissioners, in the work they have to contract out, insist on the schedules being sent in with the offers. This is a practice that is directly against what is recognised as the general practice of this Association, and if it were allowed to creep in, members would be placed in an unenviable position. During the past year, representations were made to the Gas Commissioners, who were requested to return the schedules of unsuccessful contractors, but this request was not complied with. The Association will require to come to some definite understanding not to send in schedules along with the offers in future. Another matter on which the Master Plumbers have a just complaint is the practice of the Edinburgh and Leith Gas Commissioners doing plumber work themselves. In connection with their alterations at Waterloo Place, the Commissioners supplied the material and employed the labour. No schedules were issued to the Edinburgh and Leith plumbers inviting tenders for the plumber work on the Waterloo Place job, while all the other works for the job were scheduled and tenders invited. The Gas Commissioners were approached in the matter, but they refrained from answering the questions raised in the correspondence. At the request of the Operative Plumbers' Society, the matter has been under consideration by a joint committee appointed by the Master Plumbers and the operatives, with a view to joint action being taken to safeguard the interests, not only of the employers, but of the operatives as well.

During the past year the Secretary has been in communication with the Lord Dean of Guild and the Town Clerk, with regard to the proposed new building regulations. A provisional order was drafted, and sent to the Town Council, and was remitted by them to a sub-committee for attention. The executive have asked to be allowed to consider the proposed new regulations and give an expression of opinion thereon before the committee make their report.

The new scaffolding regulations proposed by the Home Office have been dropped, in view of the pressure of other Parliamentary business, but the matter will not be lost sight of by the Executive.

Two delegates from the Association, Messrs. Simon Slater and David McKie, attended a conference in connection with the proposed Educational Bureau. Much good was expected to come out of that conference, but so far, nothing has emerged.

The Miners' Eight Hours' Bill was considered by the Executive, and a petition was sent to Parliament petitioning against it.

It was with extreme regret that the Executive learned of the death of Mr. John Sutherland, retired builder, who, for 23 years, acted as secretary and treasurer of this Association. He was the first secretary appointed when the Association was constituted on 1st December, 1871, and he held office until 14th February, 1895. A resolution of sympathy was sent to his widow.

The annual meeting of the Scottish Building Trades Federation was held in Aberdeen on September 18th last, when a fairly large number of representatives were present. There were five representatives attending from this Association.

The Glasgow Associations have not yet joined forces with the Federation, but it is hoped that ultimately they will do so.

The "Builders' Journal" has been appointed the sole official organ for the National Federation of Great Britain and Ireland. It is a first-class trade paper, with much readable and useful information in it. Several members have subscribed for the paper, and have expressed their satisfaction with it.

The annual excursion took place on 2nd July, to Loch Long and Loch Lomond, and was well attended. The annual dinner was held on 10th December, when a company of about 80 were present, presided over by Mr. McKie.

The Executive are of opinion that the present jobbing price lists for mason, joiner, and plumber work should be revised and brought down to date. It is several years now since they were last revised.

As a result of the circulars sent out to the trade in November last, the membership has been materially increased, and now stands at 110. All trades connected with the building trade are now admitted to membership, and provision will require to be made for the constitution being altered to meet the new circumstances.

The two annual scholarships in the architecture section of the Edinburgh College of Art have been awarded to Mr. James Robb and Mr. Robert H. Craig. Mr. Robb has been trained in the office of Messrs. Sydney Mitchell and Wilson, and Mr. Craig in the office of the Edinburgh City Architect. The scholarships are of the value of about £30 and are tenable for six months.

Trade and Craft.

Cox's Air Gas System.

The Machine Gas, Ltd. (Cox's Air Gas System), 180, Arlington Road, N.W., gave last week a special demonstration of their system of gas production which, briefly described, consists in the carburetting of air with a small non-condensable proportion of petrol vapour. The machine in which this process is effected consists of a small hot-air engine (operated by the gas which it produces), gas-holder, carburettor, and blower mounted on an iron stand. The gas, which is conveyed through pipes in the ordinary way, gives a brilliant light, and the apparatus is extremely compact, being 36ins. by 15ins. over all, and other sizes in proportion. The mixture is non-explosive, so that an escape of gas is unattended by danger. The system is of the greatest possible utility in places where ordinary gas is unavailable. The firm publish many convincing testimonials as to the satisfaction it is giving in a variety of services; and a long list of installations includes, for the Government, the Royal Artillery Lines at Lydd Camp, Kent, where 10,000ft. of piping has been used, distributing 2,000 cubic feet of gas per hour. Pamphlets and full particulars are obtainable at the address given above.

Coming Events.

Wednesday, May 12.

Junior Institution of Engineers, Royal United Service Institution, Whitehall.—Mr. T. S. F. Gibson, Assoc.M.Inst.C.E., on "The Construction of Coin-Freed Mechanism as Applied to Gas Meters," 7.30.

Thursday, May 13.

Paint and Varnish Society, St. Bride's Institute, London, E.C.—Mr. J. Cruickshank Smith, B.Sc., on "The Physics of a Pigment," 8 p.m.

Society of Architects.—Mr. G. Topham Forrest, M.S.A., on "Secondary Day Schools, their Planning and Equipment," 8 p.m.

Saturday, May 15.

Society of Architects.—Sketching Party to St. Albans, under direction of Mr. C. H. Ashdown.

Tuesday, May 18.

National Federation of Building Trade Employers.—Annual Meeting of the Northern Conciliation Board, at Leeds, 2.30 p.m.

Insurance.

Subscribers to "The Builders' Journal" are entitled to a Free Insurance for £500. Every subscriber should apply for this, sending a postcard with the name of the newsagent with whom the order has been placed. Subscribers can also obtain a General Accident and Sickness Insurance (the "Lighthouse" policy) at a reduced premium, which includes the Annual Subscription to this Journal. A pamphlet giving full particulars can be obtained free on application.

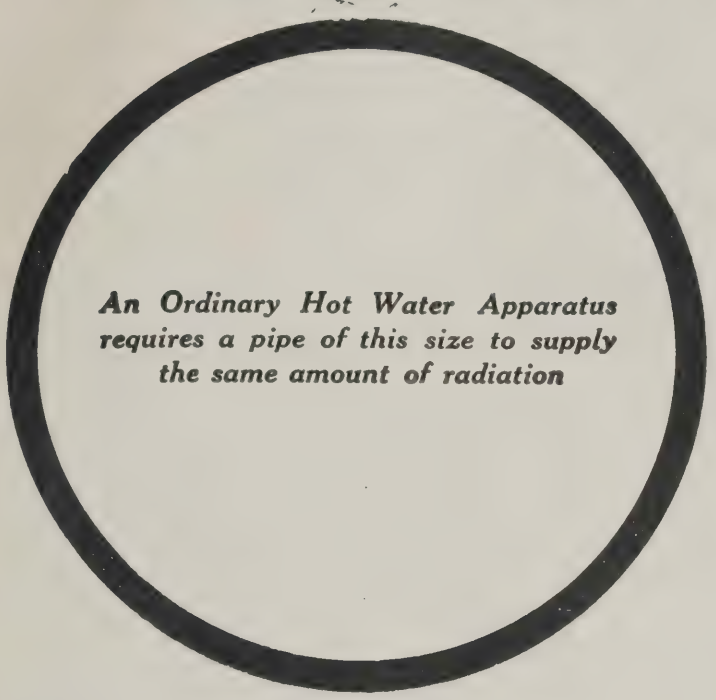
Free £500 Accident Insurance Coupons have been sent to the following:

A.A.R. (Bowes Park), A.H. (Runcorn), A.H.D. (Newport, Mon.), C.H.S. (Manchester), A.W. (Nottingham). S.G.B. (Coventry), J.W. (Blaina), J.H.F. (Bingley), T.P. (Retford), W.P.P. (Leeds), W.A.V. (Bath), C.F. (Edenbridge), L.D.P. (Largs), W.J.W. (Southend), C.G. (Newcastle), R.T.R. (Coatbridge), B.W. (Cheltenham), I.P.J. (Cardiff), E.F. (Hull), A.G.A. (Redditch), H.J.S. (Redditch).

We regret to record the death of Mr. Thomas Yeomans, who had for many years past carried on the trade of a builder at Redditch. Mr. Yeomans, who was very much respected by his colleagues, had been a member of the Redditch Association since its formation. A letter of condolence and sympathy has been sent, on behalf of the Association, to the family of Mr. Yeomans, and as a last token of esteem, the Association were represented at the funeral, and a wreath was sent by the Association.

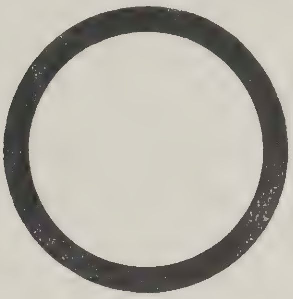
RICHARD CRITTALL & Co.,

197, Wardour Street,
Oxford Street, W.

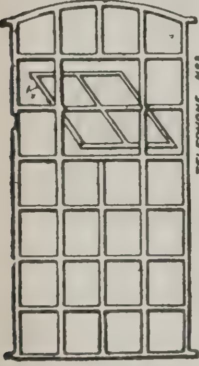


An Ordinary Hot Water Apparatus requires a pipe of this size to supply the same amount of radiation

as the "Cable" System does with a pipe of this size.



PREMIER LICENSEES FOR THE
BARKER PATENT "CABLE" SYSTEM OF HEATING
BY LOW PRESSURE HOT WATER.



PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART

TELEPHONE No 9492 Central

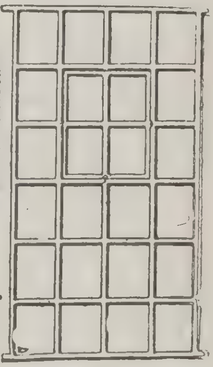
MEASURES BROS LTD 53B SOUTHWARK ST LONDON.S.E. & PITLAKE, CROYDON.

TELEPHONE No 171 CROYDON.

10,500 TONS OF SIEMENS MARTIN **ENGLISH** & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.

SECTION SHEETS, BOOKS & PRICES ON APPLICATION.

CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.



STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock.

The "Centenary" Petrol Gas Turbine Generator,
For Supply to a City or a Cottage.

THE CENTENARY GAS CO. (Dept. E), 11, QUEEN VICTORIA ST., LONDON, E.C., & 109, Hope St., Glasgow.

THE BUILDERS' JOURNAL BOOK LIST.

Being a comprehensive Catalogue of the most recent and authoritative text-books on various subjects connected with Architecture and the allied Arts of Design, Building Construction and Engineering, together with their published prices, 1908.

Price **3d.** Post Free, **3½d.**

Technical Journals, Ltd., Caxton House, Westminster, London.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are a follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - - -	6d.
Three insertions* - - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER, S.W.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aston Manor, Birmingham.—For the erection of new shops and warehouses to premises No. 3, Lozells Road, Aston Manor, for Miss A. J. Webster. Mr. Benjamin Boswell, C.E., architect and surveyor, 18, Regent Road, Handsworth, Birmingham:—

Bodhams, Moor Street, Birmingham	£285	0	0
Geo. Brooks,* Small Heath ...	283	18	1
J. and E. Baker, Lozells Road, Handsworth	244	0	0
Percy W. Case, Green Lane, Handsworth	240	0	0
W. Coleman and Son, College Road, Handsworth, Birmingham	215	0	0

*Accepted.

Bakewell.—For the various works required in erection of the Men's Institute, Bakewell. Mr. E. M. Longsdon, F.S.I., architect, Bakewell:—

W. J. Eyre, Longstone, near Bakewell	£854	12	0
T. and F. Bates, Intake, near Sheffield	840	2	2
J. Twyford and Son, Buxton Road, Bakewell	815	11	9
J. W. Wildgoose, Industrial Works, Rutland Street, Matlock	729	13	0
T. Clark,* Rutland Works, Bakewell	705	0	0

*Accepted

Bexhill-on-Sea.—For erection of a colonnade, shelters, and bandstand, for the Corporation. Mr. G. Ball, A.M.I.C.E., borough surveyor, Town Hall:—

J. Every, Lewes	£3,767	6	5
W. Pattinson and Sons, Ltd., Parliament Street, S.W. ...	3,743	6	5
Pethick Bros., Ltd., Victoria Street, Westminster, S.W. ...	3,702	6	5
S. Carey, Bexhill	3,610	9	8
Peirson and Co., St. Dunstan's Hill, Gt. Tower Street, E.C....	3,584	10	4
A. Peskett and Co., Crawley...	3,413	2	9
Peerless, Dennis and Co., Eastbourne	3,303	6	5
W. J. Fryer and Co., Paddington, W.	3,274	6	5
General Ironfoundry Co., Ltd.,* 43, Upper Thames Street, E.C.	3,193	0	0

Note.—The provisional amount allowed in the bills of quantities for artificial stone work has been abstracted.

*Accepted.

Biggleswade.—For erection of printing works for Messrs. Spong and Son. Mr. T. Cockrill, A.M.I.C.E., architect, Market Square, Biggleswade:—

S. Redhouse and Son, Stotfold ...	£1,029
Bartle and Son, Potton	999
G. Wrycroft and Son, St. Neots ...	999
C. Wright,* Langford	900

*Accepted.

Inverurie, Scotland.—Accepted for the erection of a dwelling-house. Mr. G. Gray, architect, Inverurie:—

G. Paul, mason; W. Buchan, carpenter; J. Laing and Sons, plumbers; R. Moir, plasterer; C. McDonald and Sons, Dyce, slaters; J. Mason and Sons, Aberdeen, painters and glaziers. Total, £1,290.

Rest of Inverurie.

London.—For erection of a painting shop at the Hammersmith car-shed, for the London County Council:—

C. Wall, Ltd., Lloyd's Avenue, E.C...	£5,273
J. and C. Bowyer, Upper Norwood, S.E.	5,080
W. Johnson and Co., Ltd., Wandsworth Common, S.W.	5,005
Leslie and Co., Ltd., Kensington Square, W.	[illegible]
A. Roberts and Co., Ltd.,* Earl's Court Road, S.W.	4,99[illegible]

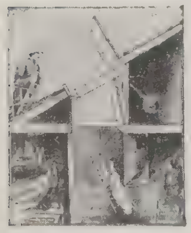
Architect's estimate, £5,140.

*Recommended for acceptance.

(*Tenders continued on page viii.*)

ROOFING SLATES.
Velinheli, Penrhyn and Westmoreland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

THE BAFECO PATENT
AUTOMATIC
TRAP-DOOR FIRE ESCAPE.
BURGLAR PROOF.



FIRE DOWNSTAIRS
Escaping to the Roof.

SIMPLE.
CHEAP.
EFFICIENT.
Easily Fixed.
A child can operate it.
A 'Bafeco' Roof-Escape safeguards at a trifling cost the lives of a whole household against Fire.
Full particulars and prices from
THE BUILDING ACTS FIRE ESCAPE CO.,
4, Southampton Row, W.C.
Telephone 2366 CENTRAL.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs.
Premier Ironworks,
DEPTFORD, S.E.

WRITE TO THE MANUFACTURERS.
BAYLISS, JONES & BAYLISS, LTD.
FENCING GATES, ETC.

WOLVERHAMPTON & LONDON.
LOW PRICES. CATALOGUES FREE. (NAME THIS JOURNAL.)

NOSTELL BRICK AND TILE WORKS,
MANUFACTURERS OF NR. WAKEFIELD.
TERRA COTTA in BUFF, RED, &c.
ROOFING AND FLOORING TILES.
Tel. Address: "WINN NOSTELL"
Tel. No. 66, WAKEFIELD.
Representative: FRANK TALBOT,
West Leigh, Walton, near Wakefield.

CLARK & CO., 32a, Westminster Palace Gardens, S.W.
X ELITE
The Most Perfect Substitute for Keene's at almost the price of Lime
ONE material only required for both render and finish
A Perfectly Sanitary Fireproof Cement
PLASTER Telegrams: "CLARCOLITE, LONDON." Telephone: 5321 WESTMINSTER. Works: Newark-on-Trent, G.N.R.

FOLDING PARTITIONS. 2/- ft. Super.
REVOLVING SHUTTERS. 1/- ft. Super.
Hartley Bros.,
GORTON, MANCHESTER.

Telegraphic Address:
"METCONSTRU, LONDON."

Telephone:
15290 CENTRAL.

THE ADJUSTABLE SHELVING AND METAL CONSTRUCTION

COMPANY, LIMITED.

Manufacturers of

Patent Steel Constructional Work,

AND

Steel or Wood Fittings,

For Stores, Warehouses, Libraries, etc.,

WITH

Fixed or Adjustable Shelving

(Patented all over the world.)

Leading Features of our Adjustable Shelving.

Easy and rapid adjusting of the shelves, even when fully loaded.

Greatest economy of space, the usual supports being dispensed with, the sideplates only require sufficient clearance to prevent chafing.

Free access of air and light, owing to the absence of the usual partitions. No corners where dust can collect. Pleasing appearance.

Contents visible at a glance. Erection and dismantling perfectly simple, only a spanner and screwdriver required.

Interchangeability of all parts. Great saving in time and cost when removal is necessary.

Our stacks are suitable for Shops, Warehouses, etc., as well as Libraries, Archives, etc.

Complete Space-Saving installations for Libraries, both Public and Private, Government and Insurance Offices, Banks, etc.; Museums, Collections, etc.; Shops, Warehouses, Showrooms and Book Stores, Business Houses and Factories.

OFFICES AND SHOWROOMS:

Gwydir Chambers, 104, High Holborn, London, W.C.

Works: The Willesden Metal Works, Willesden Junction, London, N.W.

A Splendidly Illustrated 64 pp. Catalogue sent Free on Application.

Designs, Plans and Estimates Free of Charge.

(Tenders continued from page vi.)

Ealing, W.—For the erection of St. Saviour's Church House, Ealing. Mr. George H. Fellowes Prynne, architect, 6, Queen Anne's Gate, Westminster, S.W. :—

Mussellwhite and Sapp, Basingstoke	£4,[illegible]79
Walden and Cox, Henley-on-Thames	4,694
Charles Ansell, Lambeth	4,650
Holland and Hannen, Bloomsbury ...	5,589
Goddard and Sons, Dorking	4,582
Jarvis and Sons, London, N.E. ...	4,484
J. Carmichael, Wandsworth	4,397
Ogilvie and Co., Dalston	4,350
Myring and Sons, Ealing	4,297
Wilkins and Sons, Bristol	4,278
Bowman and Sons, Stamford	4,220
Kingerlee and Sons, Oxford	4,179
Crossley and Son, Bromley	4,173
Webster and Cannon, Aylesbury ...	4,168
W. J. Dickens, Ealing	4,100

Gainsborough, etc., Lincs.—For erection of, or additions to, elementary schools, for the Lindsey County Council Education Committee, viz. :—Ropery Road, Gainsborough (new block); South Killingholme (new school with teacher's house); Skegness Council (additions); Crosby (additions). Messrs. Scorer and Gamble, architects, Bank Street Chambers, Lincoln :—

Ropery Road, Gainsborough.

H. Dorrington	£3,700	0	0
J. G. Cooling, Trent Joinery Works	3,674	0	0
Wright and Son, Park Street, Lincoln	3,558	0	0
J. W. Burrell	3,330	0	0
Scarborough, Upper Moor Street, Lincoln	3,307	0	0
B. Pumfrey	3,250	0	0
A. J. Elmes,* North Street ...	3,240	0	0

Skegness.

T. H. Cade, High Street, Boston	£595	0	0
Hockley and Co., Grantham ...	497	3	10
H. J. Thompson, Gilliatt Street, Scunthorpe	485	0	0
G. W. Wainer, 40, Sneinton Dale, Nottingham	440	0	0
J. Kime, Candesley	438	0	0
J. T. Turner and Sons, Wainfleet, Lincs	436	0	0
A. J. Elmes	430	0	0
F. Scarborough,* Moor Street, Lincoln	384	18	0

Crosby.

A. Sykes, Crosby, near Scunthorpe	£1,970	10	0
H. J. Thompson, Scunthorpe ...	1,920	0	0
T. Scarborough,* Lincoln ...	1,784	0	0

*Accepted.

Little Coates, Lincs.—For the erection of an elementary school at Little Coates, for the Lindsey County Council Education Committee. Messrs. Scorer and Gamble, architects, Bank Street Chambers, Lincoln :—

Hewins and Goodhand, Grimsby	£8,335	14	6
Moss and Sons, Ltd., Loughborough	8,300	0	0
H. Marrows, Grimsby	8,071	0	0
H. J. Thompson, Scunthorpe...	7,902	0	0
G. Longden and Son, Neepsend, Sheffield	7,771	10	0
Pattinson and Son, Ruskington, Sleaford	7,748	0	0
Holmes and Richardson, Grimsby	7,736	0	0
Wright and Son,* Park Street, Lincoln	7,697	0	0

*Accepted.

London, S.E.—For erection of depot buildings at Norman Road, Greenwich, for the Greenwich Borough Council :—

Buildings, etc., excluding Cart Shed.

F. and G. Foster, Norwood Junction	£1,850	0	0
Kirk and Randall, Woolwich ...	1,734	0	0
Wood Bros., Forest Gate ...	1,700	0	0
F. W. Western, Greenwich ...	1,659	0	0
W. Mills and Sons, Blackheath	1,640	0	0
Newell and Lusty, Poplar ...	1,600	0	0
E. Thomas, trading as Thomas and Edge, Woolwich	1,597	0	0
H. Groves, Greenwich	1,569	0	0
F. J. Gorham, Greenwich ...	1,554	11	0
F. Deacon and Son, Addlestone, Surrey	1,395	0	0
Pasterfield and English,* Streatham	1,298	0	0

Cart Shed.

F. and G. Foster	£180	0	0
F. W. Western	120	0	0
W. Mills and Sons	115	0	0
H. Groves	112	0	0
F. J. Gorham	108	0	0
Kirk and Randall	104	0	0
E. Thomas	98	10	0
Newell and Lusty	98	10	0
Pasterfield and English*... ...	98	0	0
Wood Bros.	95	0	0
F. Deacon and Son	71	13	0

Whole tenders.

Spencer Santo and Co., Ltd., Earl Street, Westminster ...	£1,943	0	0
W. H. Hyde and Co., Norwood Junction	1,737	0	0

*Recommended for acceptance

London, N.—For the extension to stables at the Liverpool Road Depot, for the Islington Borough Council. Mr. J. P. Barber, borough engineer :—

Weibking and Co., Ltd., Hackney, N.E.	£1,414	15	0
Rawkins and Jackson, Graham Street, N.	1,361	[illegible]	0
Sabey and Sons, Ltd., St. Peter Street, N.	1,305		
W. Eyre, Westminster, S.W. ...	1,266	10	0
Mattock and Parsons, Gray's Inn Road, W.C.	1,164	0	0
Stevens & Son, Crouch Hill, N.	1,164	0	0
W. Reason, Rosebery Avenue, E.C.	1,159	0	0
Newell and Lusty, Poplar, E....	1,148	4	0
H. H. Hollingsworth, Peckham, S.E.	1,124	0	0
H. E. Percy, Leytonstone, E....	1,098	5	0
F. and G. Foster, Norwood Junction, S.E.	1,080	0	0
McLoughlin and Harvey, Ltd., Brecknock road, N.	1,077	10	0
B. E. Nightingale, Lambeth, S.E.	1,074	0	0
A. N. Coles, Westbourne Pk., W.	1,058	0	0
C. P. Roberts and Co., St. Paul's Road, N.	1,019	0	0
Pasterfield and English, Streatham	1,017	0	0
W. H. Hyde and Co.,* Clifford Road, Norwood Junction, S.E.	924	0	0

*Accepted.

South Killingholme, Lincs.—For the erection of a new school, South Killingholme. Messrs. Scorer and Gamble, architects, Bank Street Chambers, Lincoln :—

J. Stamp, Barton-on-Humber...	£2,052	5	0
G. R. Usher, South Ferrily ...	2,050	0	0
H. J. Thompson, Gilliatt Street, Scunthorpe	1,851	0	0
Hollingsworth Bros., South Killingholme	1,831	11	0
Pattison and Son, Ltd., Ruskington	1,800	0	0
Pettifer & Stainton, Immingham	1,770	0	0
Holmes & Richardson, Grimsby	1,765	0	0
Scarborough,* Lincoln	1,585	0	0

*Accepted.

Wolverhampton.—For pulling down the second-class swimming bath and slipper baths, and the erection of new swimming and slipper baths for the Parks and Baths Committee. Mr. George Green, M.I.C.E., borough engineer :—

G. Caver and Son	£9,419
H. Gough and Son	9,300
T. and S. Ham	9,300
J. Lovatt, Ltd.*	9,269
R. Speaker and Sons	9,194

*Accepted.

The WALL-PAPER MANUFACTURERS, Ltd.
"Relief Decorations."

ANAGLYPTA and SALAMANDER
London Show Rooms : 71, Southampton Row, W.C.
London Tel. No. : 2731 Gerrard. Works : Tel. No. 155 Darwen.
Telegrams : "Anaglypta, London." "Anaglypta, Darwen."

LINCRUSTA-WALTON,
CAMÉOID and CORDELOVA
London Show Rooms : 1, Newman Street, W.
Tel. No. : 3769 Gerrard, London. Telegrams : "Lincrusta-Walton, London."

LIGNOMUR Works : Old Ford Road, Bow, E.
Tel. No. : 422 East, London. Telegrams : "Lignomur, London."

SAMPLES, ILLUSTRATIONS, and FULL PARTICULARS can be obtained on application to the respective Branches of the Wall-Paper Manufacturers, Ltd., as above.

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about **five days** after the date of this issue.

Unless expressly stated to the contrary, all deposits required for bills of quantities, &c., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

May 14—June 1. MORPETH.—Extending and improving Morpeth pupil teacher centre, in order to adapt the premises for use as a secondary school, for the Northumberland Education Committee. Name and address, together with a deposit of £2 2s. for specification and bills of quantities, to C. Williams, secretary to the education committee, The Moothall, Newcastle-on-Tyne, to whom tenders, endorsed "Tender for Morpeth Secondary School," must be sent. Applications for quantities by May 14.

May 15. RAMSEY, HUNTS.—Erection of an isolation hospital at Ramsey, for the U.D.C. Names to P. S. Bennett, surveyor, Ramsey, Hunts., by May 15.

May 15. HAMSTALL RIDWARE (near RUGELEY).—Erection and completion of a new council school for 82 children at Hamstall Ridware, for the Staffordshire Education Committee. Applications, accompanied by deposit of £1 1s., by May 15, to Graham Balfour, director of education, county education offices, Stafford.

May 17. MIDDLESTOWN.—All trades in the erection of three houses at Middlestown, for the Co-operative Society, Limited. Plans and specifications at the society's office. Tenders to be sent in by May 17.

May 17. OUTLANE, NEAR HUDDERSFIELD.—Erection of four dwelling houses at the Mount. Plans, etc., of J. Berry, architect and surveyor, 3, Market Place, Huddersfield, where tenders are to be delivered.

May 17. POOLE.—Erection of a pair of semi-detached cottages at the Corfe Mullen pumping station, for the corporation. Drawings and specification, etc., at the waterworks department, Municipal Buildings, Poole.

May 17. LYDIARD (WILTS).—Enlargement of chapel and erection of class-room at Lydiard. Plans and specifications with W. J. Morse, Lydiard Green, Purton, Wilts. Tenders to J. J. Webb, Lydiard, Purton, Wilts, by May 17.

May 17. BIRKENHEAD.—Repairs, etc., at the poor law offices, Conway Street, Birkenhead, for the guardians. Forms of tender, with specification, of John Carter, clerk, poor law offices, Birkenhead, to whom tenders, endorsed "Tender for repairs," must be delivered by May 17. Fair wages clause.

May 17. WICK.—Mason work in erection of new higher grade school at West Banks. Schedules from School Board's architects, D. and J. R. M'Millan, 105, Crown Street, Aberdeen. Plans and specification may be examined at office of the clerk, D. W. Georgson, Wick, to whom offers must be sent.

May 17. NORTH SEATON.—Erection of additions to the isolation hospital near North Seaton station, for the Ashington U.D.C. Plans and specifications and full particulars from the surveyor, Alexander Wood, Council Chambers, Ashington. Tenders, marked "Hospital," by May 17, to Charles Alderson, clerk to the D.C., Bridge Street, Morpeth.

May 17. LONDON.—Enclosing and roofing-in the depot in Walmer Road, Notting Hill, W., for the corporation of Kensington. Plans and specifications and further particulars at the Borough Engineer's Department, town hall, Kensington. Tenders, endorsed "Tender for Works at Walmer Road Depot," to Wm. Chambers Leete, town clerk, town hall, Kensington. Fair wages clause.

May 17. GLASGOW.—Construction of a goods shed, about 718ft. long by 57½ft. wide, on Springfield Quay, south side of Glasgow Harbour, for the trustees of the Clyde Navigation. Drawings and specification, schedule of quantities, and form of tender, of the trustees' engineer, at his office at Robertson Street. Tenders, marked "Tender for Shed at Springfield Quay," by May 17, to T. R. Mackenzie, general manager and secretary, 16, Robertson Street, Glasgow.

May 18. LANCASTER.—Tiling and joiner's works in connection with the renovation of butchers' shops in the market, for the corporation. Quantities and particulars of J. C. Mount, borough surveyor. Tenders to T. Cann Hughes, town clerk, town hall, Lancaster.

May 18. HIGHWEEK.—Alterations to and painting, papering, etc., Brookhill House, Highweek, for the Newton Abbot Union. Plans and specifications of the architect, Saml. Segar, 26, Union Street, Newton Abbot. Tenders to F. Horner, clerk to the guardians, union offices, Newton Abbot.

May 18. COCKFIELD.—Erection of new school for about 210 children, for the Durham C.C. Plans, specification, and general conditions of contract, and bills of quantities, of F. E. Coates, Shire Hall, Durham. Tenders by May 18, to A. J. Dawson, clerk to the education committee, Shire Hall, Durham.

May 18. BRADFORD.—1. Alterations to conveniences; 2, repairs to roof; 3, painting on roof, Kirkgate Market, for the Corporation. Drawings, conditions of contract, quantities, specification, and forms of tender of city architect, Whitaker Buildings, Brewery Street, Bradford. Fair contracts clause. Tenders not later than 9 a.m. May 18.

May 18. ALDERSHOT.—Supplying a tile dado and matchboarding at the sewage pumping station, and certain repairs, painting, etc., at the sewage works, manager's cottage, Ash Road, for the U.D.C. Specifications and full particulars at the surveyor's offices. Tenders to be sent to W. E. Foster, clerk, clerk's department, Municipal Buildings, Grosvenor Road, Aldershot.

May 18. DURHAM.—Erection of new council schools at Haverton Hill and Dunston; alterations at Washington Biddick Council School, for the C.C. Plans, specifications, and general conditions, and bills of quantities as follows:—Haverton Hill School (for about 900 children), W. Rushworth, Shire Hall, Durham. Dunston (Glebe Estate) Council School (for about 800 children), J. Potts and Son, architects, 57, John Street, Sunderland. Washington Biddick Council School (plans and specifications only), F. E. Coates, Shire Hall, Durham. Tenders (endorsed with name of school), by May 18, to A. J. Dawson, clerk to the education committee, Shire Hall, Durham.

May 19. GLANAMMAN, CARN.—Erection of Congregational Chapel and schoolroom. Plans and specifications may be seen at office of H. Herbert, architect, Ammanford. Tenders to T. Thomas, Council schools, Glanamman.

May 19 BRYNMAWR (WALES).—Pulling down certain old building and erecting complete a small post office and telephone exchange at Brynmawr. Plans of W. H. Dashwood Caple, F.R.I.B.A., architect, 2, Church Street, Cardiff, and of J. G. Bishop, solicitor, Brynmawr. Tenders to be delivered to the architect by 5 p.m. on May 19.

May 19. KIRKHAM.—Erection of a new elementary school and cookery and manual building, to accommodate 200 scholars, at Kirkham, for the Lancashire Education Committee. Plans and bill of quantities at the office of the county architect, Henry Littler, 16, Ribblesdale Place, Preston, upon deposit of £2.

May 19—June 14. BIRMINGHAM.—Erection of superstructure of buildings in extension of council house, for the corporation. Names and addresses to the architects, H. V. Ashley and Winton Newman, 14, Gray's Inn Square, London, W.C., by May 19, enclosing deposit of £10 10s. Drawings, etc., on and after May 31, at the offices of the architects, and of the joint quantity surveyors, Anthony Rowse, King's Court, 117, Colmore Row, Birmingham, and Hugh Watkins, 13, Gray's Inn Square, London, W.C., and bills of quantities will be sent. Tenders, endorsed, "Council House Extension (Second Contract)," by noon on June 4, to E. V. Hiley, town clerk, Council House, Birmingham. Fair wages clause.

May 20. MILNSBRIDGE.—Erection of six dwelling-houses in George Street. Plans, etc., of P. Taylor and Co., architects, Milnsbridge, to whom tenders are to be sent.

May 20. OUTLANE, NEAR HUDDERSFIELD.—Erection of a dwelling-house and boundary walls. Drawings, etc., of John Kirk and Sons, architects, John William Street, Huddersfield, where tenders are to be delivered.

May 20. WANDSWORTH.—Construction of a new Concrete and timber floor to one of the wards at the infirmary, St. John's Hill, for the guardians of the union. Specification of F. W. Piper, clerk, union offices, St. John's Hill, S.W., to whom tenders endorsed "New floor to ward," are to be sent by 10 a.m. on May 20.

May 21. PORT TALBOT.—Erection of a rocket life saving apparatus house, at Port Talbot, for the Board of Trade. Plan and specification and forms of tender on application at the Harbour Master's office, Port Talbot. Tenders to the assistant secretary, Marine Department, Board of Trade, 7, Whitehall Gardens, London, S.W., by May 21, marked on the outside "L.S.A. Tenders."

May 21. CURRAHEEN, CO. KERRY.—Erection and furnishing of National School Buildings at Curraheen, for the Board of Public Works. Plans, etc., at the district office of works, Blennerville, Tralee, and at Killarney Royal Irish Constabulary Barracks, where (and at office of H. Williams, secretary, Dublin) printed forms of tender can be had. Tenders to be sent in by May 21.

May 21. HUDDERSFIELD.—Erection of a dwelling-house, Springdale Estate. Plans of Lunn and Kaye, architects and surveyors, Milnsbridge, near Huddersfield, where tenders are to be delivered.

May 22. ST. AUSTELL (CORNWALL).—Erection of a pair of dock gates, and a new sill at Charlestown Dock, near St. Austell. Plans and specifications, and further particulars, at the harbour office at Charlestown, or of H. Bulteel, C.E., 31, Whimple Street, Plymouth. Tenders to Henry J. Bulteel, Charlestown, St. Austell.

May 22. PENCLAWDD.—Erection of a new Welsh Congregational Chapel (800 sitting) at Penclawdd. Plans and specification with the secretary, John Rees, Penlan, Penclawdd, or of W. Beddoe Rees, architect, 3, Dumfries Place, Cardiff, where bills of quantities may be obtained on deposit of £3 3s. Tenders to the secretary by 10 a.m. on May 22.

May 23. WAREHAM.—Erection of a dwelling-house at Wareham. Plans and particulars of W. Watts Fookes, architect and surveyor, Wareham, Dorset, by appointment.

May 24. ANCHOR, ST. AGNES (CORNWALL).—Erection of a new farm house at Anchor, St. Agnes. Plans and specifications at the office of Alfred J. Cornelius, M.S.A., architect, Truro. Tenders to be sent to G. H. Chilcott, St. Mary's Street, Truro.

May 24. PORTSLADE.—Enlarging the administration block, constructing porter's lodge, water tower, and destructor, forming paths, laying drains, and other work at the Infectious Diseases Hospital, Portslade, for the Corporation of Hove. Drawings, specification, and form of contract and bills of quantities and form of tender at the office of the borough surveyor, Hugh Hamilton Scott, on deposit of £2 2s. Tenders, endorsed "Tender for New Buildings at Hospital, Portslade," by 6 p.m. on May 24, to H. Endacott, town clerk, town hall, Hove.

May 25. SHEERNESS.—Erection of a mineral water factory, stables, etc., at Railway Road, for the Sheerness and District Licensed Victuallers' Mineral Water Company, Ltd. Plans and specification at the company's office, 49, Alma Street, Sheerness. Tenders, endorsed outside "New Factory," to William Golder, secretary, Sheerness, by 9 p.m. on May 25.

May 25. SUTTON-IN-ASHFIELD.—Construction of retort house, retort bench, coal elevator and conveyor, hoppers, etc., in connection with the gasworks extension, for the U.D.C. Names and addresses to Corbett, Woodall, and Son, Palace Chambers, Bridge Street, Westminster, S.W., with deposit of £3 3s. Tenders to John D. Fidler, clerk to the council, council offices, Sutton-in-Ashfield.

May 27. CHARTHAM DOWNS, near CANTERBURY.—Alterations and improvements to laundry at the Kent County Lunatic Asylum, Chartham Downs, near Canterbury, for the Kent County Asylums Committee. Drawings and specifications, etc., of W. J. Jennings, architect, 4, St. Margaret's Street, Canterbury, on deposit of £5. Tenders to Francis R. Howlett, clerk to the Asylums Committee, 9a, King Street, Maidstone.

May 29. CRYNANT (WALES).—Erection of a new church at Crynant. Plans and specification, and bills of quantities, of J. Cook Rees, architect, Parade Chambers, Neath. Tenders to the Rev. J. D. James, Vicarage, Cadoxton, near Neath.

May 29. SEVEN SISTERS, near NEATH.—Erection of a new church at Seven Sisters, near Neath. Plans and specification and bill of quantities of J. Cook Rees, architect, The Parade, Neath. Tenders to E. Evans Bevan, Cadoxton House, Neath, endorsed "Tender for church," by May 29.

No Date. HEREFORD.—Erection of a villa in Bodenham Road. Particulars to be obtained on application to W. W. Robinson, architect, Hereford.

No Date.—DARLINGTON.—Erection of a house in Langholm Crescent West, Darlington, for J. Forster. Plans, etc., at the office of J. E. Chilton, Bank Chambers, Darlington.

No date. SHIPLEY.—Re-erection of the Airedale Tannery. Contractors desirous of tendering to send their names to S. Jackson and Son, architects, 11, Tanfield Chambers, Bradford.

No. Date. ULVERSTON.—Erection of a house in Kilner's Park, Ulverston, for Mr. E. Smith. Plans and bills of quantities of Settle and Brundrit, A.R.I.B.A., architects, County Square, Ulverston.

No date. GOATACRE, CALNE, WILTS.—Erection of proposed church for Primitive Methodist Connexion. Particulars from the architect, T. E. Sandford Pitt, M.S.A., Calne, Wilts.

No Date. LITTLE URSWICK.—Erection of a shop at Little Urswick, for the Swarthmore and Ulverston Co-operative Society, Ltd. Plans and bills of quantities of Settle and Brundrit, A.R.I.B.A., architects, County Square, Ulverston.

No date. INVERKEITHING.—Erection of lodging-house. Plans may be seen at office of William Williamson, F.R.I.B.A., architect, Royal Bank Buildings, Kirkcaldy, from whom quantities may be obtained on deposit of £1 1s.

No Date. COWDENBEATH.—Execution of mason, joiner, plumber, slater, plaster, smith, asphalte, glazier, and painter works of tenements of shops and houses. Schedules of quantities and plans of William Birrell, architect and surveyor, 214, High Street, Kirkcaldy.

No date. WARKWORTH.—Execution of (1) alterations to cottages at Maudlin Farm. (2) Erection of farmhouses and buildings at West Stobswood Farm near Widdrington, for the Northumberland C.C. Plans and specifications of the County Land agent, Moot Hall, Newcastle-on-Tyne.

No date. WAKEFIELD.—Erection and completion of athletic club buildings at Hemsworth Collieries, near Wakefield, for the South Kirkby, Featherstone, and Hemsworth Collieries (Limited). Bills of quantities and all particulars from Garside and Pennington, architects, Pontefract and Castleford, on deposit of £1 1s.

No Date. NEWCASTLE-UPON-TYNE.—1, alterations to cottages at Maudlin Farm, near Warkworth; 2, erection of farm houses and buildings on West Stobswood Farm, near Widdrington, for the county council of Northumberland. Plans and specifications and quantities at the offices of the county land agent, Moothall, Newcastle-on-upon-Tyne.

No date. GLASGOW.—Mason, wright, plumber, plaster, glass, tile, fireproof flooring, cast-iron, steel, heating, lighting, and painting works required for new buildings at the county asylum, Castle Street, for the managers. Schedules with conditions and full particulars (on deposit of £2 2s.) of John Baird and Jas. Thompson, architects, 88, Bath Street, Glasgow.

No Date. PORT GLASGOW.—Erection of about 45 tenement houses in Port Glasgow. Firms desirous of tendering either for the whole work or for the mason, joiner, slater, plumber, or plaster work, should apply by letter (giving references) to James Lithgow, Port Glasgow. Plans at the offices of G. Arthur and Son, architects, 4, Graham Street, Airdrie; or J. Dansken and Purdie, measurers, 241, West George Street, Glasgow.

No date. STRATFORD-ON-AVON.—Erection of villa for W. S. Brassington, Esq., F.S.A. Particulars of E. G. Holtom, architect, 58, Henley Street, Stratford-on-Avon, from whom quantities may be obtained on deposit of one guinea.

ENGINEERING.

May 18. BUSHEY, HERTS.—Construction and erection of alterations and additions to the Hall Road pumping station, for the U.D.C. Plans, drawings, specification and conditions of contract, of Ernest E. Ryder, council offices, Bushey. Specification, bill of quantities and form of tender on deposit of £3 3s.. Tenders to be sent to John Wilson, clerk to the council, council offices, Bushey, Herts.

May 18. LONDON.—Partial reconstruction of the bridge carrying Highgate Road, in the borough of St. Pancras, over the Midland Railway (Tottenham North Curve), for the L.C.C. Drawings and specifications, bills of quantities, form of tender, and other particulars of the chief engineer of the council, Maurice Fitzmaurice, C.M.G., County Hall, Spring Gardens, S.W., upon deposit with the cashier of the council of £3. Tenders, marked "Tender for the Partial Reconstruction of a Bridge in Highgate Road," by 11 a.m. on May 18, to G. L. Gomme, clerk of the C.C., County Hall, Spring Gardens, S.W. Fair wages clause.

May 24. FARNWORTH.—Supply and laying in position, etc., of extra high and low tension cables in connection with extensions at electricity works; also supply and entire fixing into position of ten circuit breakers in connection with the additions to the switchboard, for the U.D.C. Plans and drawings and specifications and quantities from R. B. Leach, electrical engineer, Electricity Works, Farnworth. Tenders to W. Tyldsley, clerk, council offices, Farnworth, S.O.

IRON AND STEEL.

May 17. MERTHYR TYDFIL.—Supply of about 50 tons cast-iron pipes and specials for water mains. Form of tender and specification from borough engineer, Town Hall, Merthyr Tydfil. Tenders to T. Anewryn Rees, town clerk, at same address.

May 21. PLYMOUTH.—Supply and delivery of wrought-iron palisading and entrance gates for the boundaries in connection with the Millbay Barracks improvement scheme. Particulars of James Paton, borough engineer and surveyor, municipal offices, Plymouth.

PAINTING.

May 15. AYLSHAM.—Repair and decoration of town hall for the Parish Council. Contractors desirous of tendering to send their names to the clerk to the Council, H. F. Proudfoot, at Aylsham, not later than the date named.

May 17. LEYTONSTONE.—Painting a portion of the interior and exterior of schools, High Road, Leytonstone, for the Bethnal Green Board of Guardians. Forms of tender and specification on deposit of £2 2s. with D. Thomas, clerk to the board, guardians' administrative offices, Bishops Road, Victoria Park, N.E., to whom tenders are to be sent.

May 18. BRADFORD.—Painting on roof of Kirkgate Market. See under "Building."

May 18. DURHAM.—Painting, etc., the following council schools, for the Education Committee:—Haverton Hill, Hartburn, Sedgefield temporary, Trimdon Colliery, Norton girls' and infants'. Specifications and form of tender, of J. Leonard, Station Road, Norton-on-Tees, to whom tenders must be sent.

May 18. ST. ANNE'S PARK, etc.—Cleaning and repainting stations, etc., at the following places, for the Great Western Railway:—1, St. Anne's Park, Nailsea, Puxton, Lawrence Hill and Temple Meads (Bristol); 2, Bath and Wootton Bassett; 3, Frome, Pewsey, and Woodborough; 4, Neath (Low Level), Landore (High Level) and Landore (Low Level); 5, Cradley, Smethwick Junction, Langley Green, Old Oldbury, Rowley Regis, and Windmill End; 6, Handborough, Charlbury, Shipton, Adlestrop, Hook Norton, Chipping Norton, Moreton, Blockley, and Campden; 7, Norton Junction, Stoulton, Pershore, Fladbury, Evesham, and Worcester; 8, Fernhill Heath, Droitwich, Hartlebury, Churchill, and Hagley; 9, Aynho, King's Sutton, Kidlington, Heyford, Olton, and Widney Manor; 10, Lawley Bank, Horsehay, Madeley Court, Ketley, Crudgington, Peplow, and Hodnet. Specifications and forms of tender and bills of quantities at the office of the engineer at Bristol for 1, 2, 3; at Neath for 4; and at Wolverhampton for 5 to 10. Tenders, marked outside "Tender for Station Painting," by 10 a.m. on May 18, to G. K. Mills, secretary, Paddington Station, London.

May 19. DALMARNOCK.—Painting and tarring iron work of the bridge over the River Clyde at Dalmarnock, for the Joint Bridges Committee. Specifications and forms of offer of the master of works, Thomas Nisbet, City Chambers, 64, Cochrane Street, Glasgow, to whom tenders are to be sent.

May 22. BANGORN VILLAGE.—Painting exteriors of the Five Wood and Iron Homes for Edinburgh District Board of Lunacy. Specification from James Kyd, clerk and treasurer, Chambers, Castle Terrace, Edinburgh, to whom tenders are to be sent.

PLUMBING & SANITARY

May 12-27. IPSWICH.—Alterations and additions and new latrines at St. John's Home, Ipswich, for the guardians. Applications to J. A. Scheuermann, architect, Norgate Street, Ipswich, before noon on May 12, accompanied by deposit of £1 1s. (cheque). Bill of quantities supplied. General conditions, specification, plans, and sections at Mr. Scheuermann's office. Tenders, endorsed "St. John's Home," by 4 p.m., on May 27, to Richard J. Kent, clerk to the guardians, guardians' offices, 19, Tower Street, Ipswich.

May 17. DUNDEE.—Forming concrete slab, etc., at Gagie Filters, for the Dundee Water Commissioners. Schedule and form of tender of George Baxter, engineer and manager, water engineer's office, 93, Commercial Street, Dundee. Tenders, marked "Tender for Concrete Slab, Gagie Filters," with Wm. H. Blyth Martin, clerk to the commissioners, City Chambers, Dundee, by May 17.

May 18. BRADFORD.—Alterations to conveniences, Kirkgate Market. See under "Building."

May 18. EAST STONEHOUSE.—Works of improvement in Union and Edgcumbe streets, for the U.D.C.:—1, laying about 194 yards of 18in. stoneware sewer; 2, lining about 493 yards of an existing sewer with concrete slabs and building five new access channels; 3, laying about 700 yards of 7in. water main; laying about 4,900 yards of Jarrah wood paving. Names of persons wishing to send in inclusive tender, with deposit of £2 2s., to C. H. Trounce, surveyor and water engineer.

May 20. DUBLIN.—Plumbing and gasfitting works and supplies and ironmongery supplies, for Commissioners of Public Works, Ireland, at several buildings in Dublin and its vicinity. Forms of tender and schedules of supplies on deposit of £1. Tenders endorsed "Tender for Plumbing, Gasfitting, etc., Works and Supplies, by 10 a.m. on May 20, to H. Williams, secretary, Office of Public Works, Dublin.

May 20. ASHFORD (MIDDLESEX).—Sewerage and sewerage disposal works, consisting of pumping machinery, storage, screening and subsidence tanks, sludge well, basteria beds, cast-iron rising main, valves and stoneware sewers; also the conversion of the existing earth closets to latrines and water closets, together with soil pipes, cisterns, etc., for the managers of West London District School, Middlesex. Plans and particulars of Prof. H. Robinson, Parliament Mansions Victoria Street, Westminsster. Forms of tender, with the specification, quantities and conditions, of F. G. Beeching, clerk to the managers.

May 24. LONG ASHTON (SOMERSET).—Execution of additions to the sewage disposal and sewerage works in Long Ashton, for the R.D.C. Plans and specification of the engineer, A. P. I. Cotterell, M.Inst.C.E., 28, Baldwin Street, Bristol. Bill of quantities and form of tender from the engineer, on deposit of £1 1s. Tenders to Albert E. Hicks, union offices, Flax Bourton.

No Date. STOCKSBRIDGE.—Laying about 1,200 lineal yards of 6in. sewer, for the U.D.C. Particulars and form of tender of Fowler and Marshall, engineers, 3, Hartshead, Sheffield; also of J. Marsden, clerk to the council, council offices.

ROADS AND CARTAGE.

May 18. LONDON.—Supplying machine-broken road stone and stone chippings, for the G.W. Railway. Conditions of contract and forms of tender of G. K. Mills, secretary, Paddington Station, London, to whom tenders, marked outside "Tender for Road Stone, etc.," are to be sent.

May 19. GOLCAR.—Construction of a new street off Sear Lane. Quantities of Arthur Shaw, architect, Golcar, to whom tenders are to be sent.

May 19. CLACTON.—Making up the road known as Pier Gap, for the U.D.C. Drawings, specification and conditions and copies of the quantities of A. R. Robinson, surveyor to the council, town hall, Clacton-on-Sea. £1 1s. deposit for quantities. Tenders by noon on May 19, to Geo. T. Lewis, clerk to the council, Town Hall Buildings, Clacton-on-Sea.

May 19. BIRMINGHAM.—Making good Rookery Road, Selly Hill Road, and Coronation Road, Selly Oak, for the King's Norton and Northfield U.D.C. Bills of quantities and forms of tender, and plans and specifications, of the engineer and surveyor to the council, Ambrose W. Cross, A.M.I.C.E., 23, Valentine Road, King's Heath, on deposit of £1 1s. Tenders to Edwin Docker, clerk to the council, 10, Newhall Street, Birmingham.

May 20. ROMNEY MARSH.—Supply and delivery of 300 yards of Cherbourg quartzite, for the R.D.C.:—100 yards 2in. gauge, Ivychurch Road, Snave; 100 yards 2in. gauge, Brenzett Road, Ivychurch; 20 yards 1in. gauge, Ivychurch Road, Brenzett; 20 yards 1in. gauge Snave Road, Brenzett; 20 yards 1in. gauge, Straight Road, Brookland; 20 1in. gauge, Alliance Road, Brookland; 20 yards 1in. gauge, Guldeford Road, Brookland. Tenders to William B. Smith, district surveyor, New Romney.

May 20. CHATHAM.—Supplying 2,020 tons 2½in. broken granite or other hard stone for macadam; 2,800 cubic yards 2½in. surface picked flints; also Jarrah wood blocks, for the corporation. Specification, stipulations, schedule, and form of tender, at the borough surveyor's office, town hall, Chatham. Tenders, endorsed "Tender for Road Material, or Wood Blocks," as the case may be, to Charles Day, borough surveyor, town hall, Chatham, before 10 a.m. on May 20.

May 24. STRATTON ST. MARGARET.—Making up Pump Lane, Stratton St. Margaret, for the Highworth R.D.C. Plans and specifications of John P. Kirby, clerk to the Council, 100, Victoria Road, Swindon, to whom tenders are to be sent.

May 26. WOOD GREEN.—Making-up (1) Dukes Avenue (from the Parish Boundary to Grove Avenue), and (2) Wellesley Road, for the U.D.C. Plans, sections, and specifications, and bills of quantities, on application to the surveyor, town hall, Wood Green, upon deposit of £1 1s. with Wm. P. Harding, clerk to the council, town hall, Wood Green, to whom tenders are to be sent by 5 p.m. on May 26. Fair wages clause.

May 27. ASHFORD, KENT.—Supplying 1,160 cubic yards (more or less) of 2in. gauge broken granite, as per form of tender, to be obtained of the surveyor. Tenders (with samples), endorsed "Tender for Granite," by 5 p.m. on May 27, to William Terrill, surveyor, 5, North Street, Ashford, Kent.

May 27. ASHFORD (KENT).—Supply and delivery of 380 cubic yards (more or less) of unbroken Kentish ragstone, and 400 cubic yards (more or less) of coarse gravel or pit flints, for the U.D.C. Further information of William Terrill, surveyor, 5, North Street, Ashford, Kent, to whom tenders (with samples) are to be sent.

MISCELLANEOUS.

May 24. ARBROATH.—Supplying cast-iron and fireclay pipes, coals, bricks, lime, cement, brass-work, oils, pavement, kerb, channel, and setts, from June 1 1909, to May 31, 1910. Schedules of quantities and all information of P. C. Smith, burgh engineer, burgh engineer's office, Arbroath. Tenders to be lodged with W. K. Macdonald, town clerk, Arbroath.

No Date. MONTROSE.—Supplying paints and oils, ironmongery, builder's material, etc., for the Royal Asylum. Schedules, etc., on application to the House Steward.

THE

Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:

8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,

General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE Junior Assistant desires post in small office south of Midlands; working drawings, details, help quantities; good draughtsman and tracer; excellent references; salary 22s. per week.—Architect, 36, Devonshire Road, Cambridge.

ACADEMY (Royal) exhibitor prepares perspectives on moderate terms; specimens sent; also designs, plans from rough sketches, drawings, tracings, competition work, etc.—Box 4983, BUILDERS' JOURNAL Office.

ADVERTISER (28), seeks position of trust in a business; 10 years with large London builders; good references; security would be given, if required.—Address, E.G., 6, The Avenue, Brondesbury, N.W. 5012

ADVERTISER, with six years' practical experience and a knowledge of bookkeeping and office routine, desires situation in builder's or estate agent's office.—C. J. Mounter, 24, Hillfield Road, West Hampstead, N.W. 5028

ADVERTISER (32), calling on architects and contractors in London, would represent good country firm; part salary and commission.—"Sunnyside," 65, Pretoria Road, Streatham, S.W.

ADVERTISER seeks position as junior assistant, 3½ years' experience; excellent draughtsman, surveying, levelling, book-keeping, general office routine; highest testimonials; low salary.—Box 5045, BUILDERS' JOURNAL Office.

AN experienced young architect, with small connection, desires position or work at own office; prolific designer and rapid draughtsman; specifications, etc.—"C.," 24, Hainthorpe Road, West Norwood, S.E. 5026

AN Architect's Assistant desires re-engagement; town or country; neat and quick draughtsman; thoroughly capable; moderate salary.—M. P., 358, New Cross Road, S.E.

APPOINTMENT as Improver (19), just completed three years' articles with architect; good draughtsman, tracer, etc.; excellent testimonials; moderate salary.—J.S.C., 10, Almeric Road, Clapham Common. 4993

ARCHITECT'S Assistant desires re-engagement in a good London office; eight years' experience; good references; experience in competition work.—B. E. Atkinson, jun., 14, Rosslyn Hill, Hampstead, N.W. 5018

ARCHITECT'S Assistant (27), good draughtsman and colourist; contract drawings, designs, details, perspectives, surveys; travelling studentship winner; specimens.—H. C. S., 65, Grove Road, Norwich 5025

ARCHITECT'S Assistant desires engagement, finalist, R.I.B.A.; design, details, specifications; first-class honours, quantity surveying, honours (Part I.), building construction, artistic and practical; moderate salary.—Address, Architect, 24, Brunswick Street, C.-on-M., Manchester. 4984

ARCHITECT'S Assistant (24), disengaged; Inter. R.I.B.A., 6½ years' varied experience, town and country; working drawings, details, and perspectives; levelling, reinforced concrete details; assist with quantities.—Riches, 35, Culverden Road, Balham, S.W. 5013

ARCHITECT'S Assistant (23), 6½ years' experience; excellent draughtsman, working drawings, details, specifications, surveying; assist with quantities; first-class references.—H.B., 23, Springfield Road, Bury St. Edmunds. 5001

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill, S.W. 4992

ARCHITECT'S Assistant (23), excellent draughtsman, desires re-engagement; six years' first-class experience; contract, detail and competition drawings, specifications, perspectives (exhibitor at Royal Academy); prizeman for architectural design; highest references; moderate terms.—F.E.T., 10, Cobham Road, Kingston-on-Thames. 5015

ARCHITECT, 32, qualified, seeks any position where his services would be available; energetic; disengaged; mod. salary.—Box 5006, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant, nine years' experience; bronze and silver medallist; acted clerk of works; perspective, details, etc.; assist on quantities.—French, 23, Port Street, S.W.

ARCHITECT'S Assistant seeks engagement; 14 years' experience; plans, details, specifications, quantities, surveying, dilapidations, and levelling; excellent references.—C. G., "Brooklyn," Leas Road, Guildford.

ARCHITECT'S Assistant disengaged, good all-round; design, construction, specification, supervision, dilapidations, surveying, etc.; excellent testimonials.—H., "Bowood," Heronsgate, Ricksmansworth, Herts.

ARCHITECT'S Assistant (24), eight years' experience; chiefly schools; intermediate R.I.B.A., first-class design, construction, architecture, ornament; folio of drawings sent for approval.—Vivian S. Whitaker, Barcroft, Bromsgrove, Worcester. Salary 49s.

ARCHITECT'S Assistant (23), capable draughtsman; good constructionalist; would go on trial for permanency; town or country; temporary work 35s.—H. J. W. E., 1, St. Dunstan's Road, Hanwell, W.

ARCHITECT'S Assistant seeks engagement; good draughtsman; working drawings, details, surveying, levelling, and quantities; eight years' experience.—Owen, "Meadowside," New Queen Street, Chesterfield.

ARCHITECT'S Competent Assistant desires engagement; many years' practical experience; designs, details, specifications, superintendence, surveying; two guineas.—Arch, 23, Lavenham Road, Wandsworth, S.W.

ARCHITECT and Surveyor's junior assistant (22), 4½ years' experience, desires re-engagement; neat and expeditious draughtsman; working drawings, surveying and levelling.—Williams, "Brynderwen," Pontyclun, Glam.

A.R.I.B.A., disengaged shortly, London training; chief and senior assistant in leading provincial offices; expert designer, and experienced in all branches.—A. G., "Beverley," Yardley Wood Road, Moseley, Birmingham.

ARCHITECT'S Assistant (22), desires re-engagement in London office; contract drawings, details, surveys, double scholarship holder; Stage III., Building Construction.—Smeed, 24, West Ham Lane, Stratford, E. 5050

ARCHITECT, prepares designs, working drawings, specifications, on moderate terms; assistance rendered, town or country.—Box 5,036, BUILDERS' JOURNAL Office.

ARCHITECT'S Junior Assistant (20), 4½ years' experience, West End and country offices; working drawings, details, perspectives, competitions, general office routine; excellent draughtsman and tracer. Highest references; salary 25s.—G. W. S., 26, Cowley Road, Ilford, Essex. 5056

ARCHITECT'S Assistant (24), over six years' experience; working drawings, details; knowledge of quantities ;specification, land surveying; good references.—G. O. E., 72, St. Ann's Hill, Wandsworth, S.W.

BUILDERS' and Contractors' Assistant desires situation, knowledge of plans, specifications, quantities, wages and general office routine; age 21; 4½ years' experience; salary moderate; good timekeeper.—Box 4994, BUILDERS' JOURNAL Office.

BUILDER'S Clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N.

BUILDER'S Book-keeper, 9 years' excellent reference from present employer. All books, double entry, prime costs, accounts, trading and profit and loss accounts, etc.—Box 5049, BUILDERS' JOURNAL Office.

CARPENTER, and French polisher wants situation, young, capable workman, good refs.; moderate wage.—C.P., 21, Redstone Road, Redhill, Surrey. 4989

CLERK of Works, disengaged; experienced in building and engineering works; home or abroad; fluent French, translations.—Address, Tett, 78, Durban Road, Beckenham, Kent. 4988

CLERK of Works, shortly disengaged, well up in all trades; levelling and surveying; best references; abstainer.—R. E., 3, Oakfield Road, Stroud Green, London, N. 5052

DRAUGHTSMAN (26), home or abroad, neat, quick tracer and colourist, working drawings from rough sketches, bookkeeping and general office routine; foreign experience.—H.W., 64, Crofton Road, Camberwell, S.E. 5003

ENGINEER, 29, disengaged; exp. in designs, detail, drawings, calculations, quantities, structural steelwork, fireproofing, reinforced concrete, bridges, buildings.—Box No. 4991, BUILDERS' JOURNAL Office.

ENGINEER, mechanic, desiring change, requires permanent situation on staff, official or private; thorough all-round general experience; married.—J.G., 86, Bathurst Gardens, Willesden, N.W. 5011

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W. 4951

JUNIOR (20), 4 years' experience, good draughtsman, quick and accurate leveller and surveyor, building, sewerage, water supply, abstracting, billing quantities, typewriting, shorthand; salary no object.—S.F.H., 16, Dodington, Whitchurch, Salop. 5032

JUNIOR Assistant, disengaged; good knowledge of domestic architecture.—Reply, J. R. F., 248, Sandycombe Road, Kew Gardens, S.W. 5031

MASONRY, manager or foreman, machinery and all details, all classes of masonry work; London and country experience; terms moderate.—G.B., 38, Napier Road, Tottenham, London. 4975

FRENCHMAN, Architectural Draughtsman, having an office at Rouen (France) is willing to accept representation of English articles used in building.—Write Ledien, 39, Petherton Road, Highbury, London, N.

SHOP-FITTING, or high-class joinery, advertiser (38), seeks situation as foreman in shop-fitting or high-class joinery works; can take full control; 9 years' references; abstainer.—Box No. 5007, BUILDERS' JOURNAL Office.

SUPERIOR first-class architectural draughtsman seeks engagement; smart at competition work; good colourist; excellent at elevations; £2 2s. per week.—H. Y., 6, Aldermanbury Avenue, E.C.

TYPEWRITING, tracing, shorthand, good class work, requiring intelligence and accuracy, can be undertaken in spare time by architect's clerk.—Address, "Typist," 2, Marsham Street, Westminster. 5043

YOUTH wants situation, surveyor's or builder's office; four years' experience; working up quantities, measuring up, good draughtsman; scholarship holder; excellent testimonial.—J. R. O., 233, Essex Road, N. 5017

Appointments Vacant.

FIRST-CLASS mould maker, for artificial stone works required, and to act as foreman; joiner preferred; good wages, house and garden, and permanent situation to the right man; apply, stating wages and experience, to Edwin J. Pearce and Co., De Montfort Chambers, Horsefair Street, Leicester. 5039

REQUIRED, experienced working manager, one prepared to invest in a small paying brick works in Carmarthenshire.—Apply first, Thomas, 71, Moy Road, Cardiff. 5042

TO Architects, estate agents, builders, Ironmongers, gas-fitters, etc., agents in town and country are wanted for air gas machine; large and small installations for lighting and heating in public and private establishments, factories, etc. Already working most efficiently.—Apply Machine Gas, Ltd., 180, Arlington Road, N.W. 5047

WANTED, assistant in decorative marble, contractor's office; must be competent to prepare scale and full size drawings; also knowledge of taking out quantities for estimating.—Box 5046, BUILDERS' JOURNAL Office.

WANTED, builder's assistant, for books and general office routine; state salary required, age, and experience, to G. Kersley, Builder, Blackwater, Hants. Letters only. 5041

WANTED, in country builder's office, (Somerset), competent and confidential clerk, married man preferred; permanency to suitable man. Apply, stating wages and references, to Box 5038, BUILDERS' JOURNAL Office.

WANTED: Builder's Clerk, young man; state age, experience, and wage wanted; copies of testimonials only, which will not be returned.—Box 5051, BUILDERS' JOURNAL Office.

NORTHAMPTONSHIRE COUNTY COUNCIL EDUCATION COMMITTEE.

An Assistant will shortly be appointed in the Education Surveyor's Department. He must be a good draughtsman, and accustomed to inspect and report on work in progress. Experience in an architect's or a Surveyor's office is essential.

The salary offered is £120, rising by £5 increments to £150 per annum.

Forms of application may be obtained from the undersigned, and must be returned not later than Saturday, May 8, 1909.

J. L. HOLLAND,
Secretary of Education.
County Education Offices,
Northampton. 4998

May 19, 1909. Volume 29. No. 745.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders:—Registration and the R.I.B.A. Election, 471; The Divorce of the Arts, 471; Academic Study, 471; The Budget and Land Values, 471; Architectural Copyright - - - - - - - - - 472
R.I.B.A. Supplemental Charter - - - - 472
The Society of Architects: Travelling Studentship, 1909 - - - - - - - - 472
The A.A. Dinner - - - - - - - 473
Architectural Competitions: Some suggested reforms. By T. Faulkner Shepheard - 474
Views and Reviews - - - - - - 476
Notes on Competitions - - - - - - 476
In Parliament - - - - - - - - 477
The Beachcroft Reservoir - - - - - 477
Secondary Schools: Their planning and equipment. By G. Topham Forrest, M.S.A. - 478
Buildings in Progress and Completed - - 480
Our Plate - - - - - - - - - 480
A New Theory of Plans. By Max Judge - 481
German Town Planning: Lessons of the Recent Tour. By T. Alwyn Lloyd and H. Colin Allen - - - - - - - - - 481
Correspondence—Against Back-to-Back Houses and Block Dwellings. The Taxation of Land Values - - - - - - - - 483
Enquiries Answered - - - - - - - 483
Quantity Surveyors' Association: Annual Dinner 485
Architects' Charges in America - - - - 485
Societies' Reports - - - - - - - 486
Coming Events - - - - - - - - 488
Insurance - - - - - - - - - 488
Tenders - - - - - - - vi., viii.
Complete List of Contracts Open xvii., xviii., xix.

ILLUSTRATIONS.

Centre Plate. House at London Road, Chelmsford; C. H. B. Quennell, F.R.I.B.A., Architect. General View and View of Hall. Plans - - - - - - - - - - - 480
New Charlottenburger Bridge, Berlin; A Recent Example of German Civic Architecture. Entrance, 473; View from River, 475; Statues of Queen Sophie Charlotte and King Frederick I. of Prussia - - - - 477
Secondary Schools: Their Planning and Equipment. Suggested Arrangement of Chemical Laboratory - - - - - - - - 479
Bank of Speyer and Co., Basle, Switzerland. Charles F. Mewes, Architect - - - 482
House at Binton Park, Farnham, Surrey. Arthur J. Stedman, Architect. View, 487; Plans - - - - - - - - - - 488

Registration and the R.I.B.A. Election.

In view of the favourable opinion on the subject of registration which has been recently shown to exist in the architectural profession as a whole, several of the provincial societies in alliance with the R.I.B.A. have resolved to support the efforts of the Institute Members' Club to obtain a return of such a representation on the Council of the R.I.B.A. as shall reflect the opinion of the majority of members of the Institute on this important question. At a meeting of the Leicester and Leicestershire Society of Architects recently called for the express purpose of conferring "on the subject of the forthcoming elections to the Executive of the Royal Institute of British Architects," it was unanimously decided to support the candidature of the registrationists, and many other provincial societies are rendering equally loyal and useful service.

The Divorce of the Arts.

The A.A. Members' dinner was chiefly remarkable for an interpellation on the divorce of the Arts. It is not a new subject, and in the hands of a speaker with less verve than Sir William Richmond, would have excited no more than mild academic interest. Last Wednesday evening Sir William was followed with close and undivided attention, which may have been indicative of a desire among architects and painters to join hands once more. Or this respectful attention may have been due only to eloquence following a good meal. At present the painters are rather in the position of the music hall artiste who is offered a part in the legitimate drama. The latter carries a more recognised status, but the man becomes one of a crowd, each individual engaged in adding a quota to produce the complete work of art. In the "halls" no one divides the limelight with him, and providing he "catches on," there are possibilities of "starring" and big salaries, which are sore temptations. Sir William's advice to take young sculptors and painters and train them up within the rigid lines of architecture sounds at the present moment like a counsel of perfection. Architects are finding it hard enough to make a living themselves let alone aiding the sculptor and painter. At present the clients, as the Americans say, "Won't stand for it." And it is the difficulty of persuading clients to "stand for it" in the matter of decorative painting and sculpture that makes Sir William's rosy future in the arts seem to us like a very beautiful dream.

Academic Study.

At the same function, and in proposing the toast of "The Guests," to which Sir William Richmond replied, Sir A. Brumwell Thomas introduced a topic which can well be commended to the attention of our educationists. He pleaded for a higher course at the A.A. School for the purpose of academic study. They educated men up to a point and then left them—the point being, presumably, that which enables them to take the A.R.I.B.A. qualification and a place in the profession. Sir Brumwell Thomas proposed this course—which might be a diploma course—to absorb the enthusiasm of numbers of budding architects and create a national enthusiasm for architecture among the public. The idea seems a very excellent one if the enthusiastic students are to hand, and this extra course of study might well be devoted to the Grand Manner. We suffer largely at the present day from pettiness in architecture—pettiness of conception, pettiness of scale, pettiness of detail. And that is because our men have never been taught properly to face a big thing. As Mr. George remarked at the same meeting:—"We want something beyond the answering of economic requirements."

The Budget and Land Values.

In the closured debate on the Budget proposals with regard to the taxation of land values, in the House of Commons last Wednesday, the most important speech was undoubtedly that of Mr. Harold Cox, who made some strong points against the Government proposals. At the outset, he made, it is true, a deplorably banal reference when, in pointing out the fundamental difference between land and other property—namely, that a man who owned a piece of land was liable to the risk of having that land taken from him because the public required it—he added, "whereas a man owning pictures or a pair of trousers was not liable to have them taken from him." He pointed out very cogently the enormous difficulty of ascertaining —or, rather, of fairly assessing—the value of land. The expenditure on the attempt might amount in the aggregate to hundreds of thousands of pounds; the costs of the landlord in defending himself against the valuer would be great, and there was likely to be a stupendous amount of litigation. What, he asked, was to prevent the evasion of the tax on undeveloped land by putting up some rough-and-ready sheds and shanties, and claiming that the land was no longer undeveloped? Mr. Cox stated that he had received a letter from master builders of Bradford pointing out that it was the usual practice in that town for builders to purchase the freehold of land for the express purpose of erecting buildings upon it. Land, therefore, was the raw material of their industry. Would the Chancellor of the Exchequer impose a tax on this raw material, and thus inflict an injury on a class that was by no means wealthy? While the tax would almost compel owners of beautiful open spaces—like Holland Park, for instance—to cover them with bricks and mortar, municipal authorities—including the London County Council—who are the worst holders-back of land, are to be exempted. As to the housing aspect of the question, it seemed absurd, in face of the countless empty houses around London, to talk of developing land in order to provide more dwellings. He thought it a grave injustice to reverse the principle upon which all civilised countries had hitherto proceeded—the principle that land was interchangeable with all other forms of wealth. Mr. Lyttelton declared that land taxes would check the growth of garden suburbs, and nobody but the lawyers and surveyors would reap any benefit. Supposing a man invested a large sum in land, laid out roads, etc., and then for some unforeseen reason the neighbourhood did not develop. The man found himself burdened for years with heavy charges for capitalisation, and would have to prove to some Excise officer that he had no unearned increment. Mr. Lloyd George, in reply, deprecated criticisms on a Bill which had not been introduced, and of which the terms were not known, and in particular he repudiated the suggestion that anything in the Bill would be injurious to garden cities or other amenities. Then, again, the Government proposed to exempt all expenditure by a landowner on property with a view to making it fit for building. Very poor land, he said, is used for housing purposes —land at 4s. or 5s. an acre is let for the purpose of building houses for workmen. As a rule, a ground rent of about £2 a house is expected, and the acre of land that used to produce about 5s. an acre is now producing about £50 an acre, and more. Was it too much to ask the owner to pay a halfpenny in the pound on that improved value towards a pension for the worn-out worker? It will be seen that the reply of the Chancellor of the Exchequer to his critics was somewhat rhetorical; but so also were the speeches of his opponents; and builders, who have such serious interests at stake, must feel considerable impatience with the purely gladiatorial displays on both sides that marked the course of a most unsatisfactory debate, which, after degenerating into something that was very like a wrangle, came to a lame and impotent conclusion by the enforcement of the closure.

Architectural Copyright. The question of architectural copyright is again being discussed with considerable vigour, in view of the belief that the matter is about to be thoroughly investigated by a Committee of the House of Commons. Those who urge that a building is as much a work of art as a painting or a statue, and is therefore as much entitled to the protection afforded by the law of copyright, hardly seem to appreciate the practical difficulties of the problem. Effective protection for the architect might act in restraint of building and against the public interest; and ineffective protection is not worth while. In the former case, much valuable educational influence would be lost, as the young architect would be afraid to study the best work of the best men, lest he should reproduce colourable imitations of it, and thus render himself liable to pains and penalties. Cases in which the copyright of pictures has been vindicated have often resulted in an order for the destruction of the entire pirated issue, or that it shall be handed over to the author of the original. That a similar restitution should be made in the case of a pirated building may be a grotesquely Gilbertian idea, but it will perhaps serve to indicate that there are important differences of incidence as between buildings and pictures or books or music. The principle of the existing law of copyright is mainly concerned with wholesale reduplication, to the detriment and loss of the original author. Some approach to wholesale reduplication is found in the case of small dwellings that are constructed in hundreds from designs for a single pair. This is obviously unfair to the architect, and it would be well if some means could be found of reserving to him a kind of royalty in each repetition; and this royalty, while insufficient to increase at all materially the cost of building, would be a welcome addition to the income of the architect, and it would imply his power of veto, which would enable him to prevent his designs being perverted or caricatured, or carried out in an objectionable environment. This, however, very obviously involves a certain degree of restraint of trade; and this consideration, perhaps emphasized and exaggerated, might conceivably be fatal to the hopes of those who are seeking protection. Then, again, the architect who has conceived a gem of domestic work, should be spared the annoyance of seeing it repeated, perhaps with deplorable variations, in inferior materials, on an unsuitable site; but he has no remedy either for his injured feelings or for the unfair enjoyment by another man of the fruits of his ability—a man who perhaps underbids him. Here again the plausible allegation of "public interest" would probably outweigh the advocacy of the private interests of the architect, who, even supposing copyright were granted, would usually find it an exceedingly difficult task to establish a charge of plagiarism. In indicating some of the difficulties that stand in the way of copyright in architecture, we have no desire to throw cold water on the proposal; which we think ought not to be modelled quite closely on existing copyright laws, but should be modified to meet the special circumstances of the case; and therein lies the chief difficulty of the problem. We understand that the matter is being taken up very seriously by the Berne Convention, and in that case the problem is considerably complicated by international considerations, and British interests should be very closely watched.

R.I.B.A. SUPPLEMENTAL CHARTER.

A special general meeting was held on Monday evening last to consider the proposals of the Council of the R.I.B.A. for the revision of the by-laws under the new Supplemental Charter. With regard to the latter document, which has now received the Royal approval, its most important feature has reference to the election of the new class of members known as Licentiates, who are defined as "architects who have attained the age of 35 years and either (a) have been engaged as principals for at least five successive years in the practice of architecture, or (b) have been engaged for at least ten successive years in the practice or the study of architecture. But unless determined by resolution of a general meeting of the Royal Institute, confirmed at a subsequent general meeting, held not less than seven nor more than twenty-eight days after the former meeting, no person shall be elected as a Licentiate after the expiration of twelve months from the date of the coming into force of the first by-laws relating to Licentiates." The following clause (2), relates to the admission of Fellows:

"After the date of this Our Charter no person shall, save as hereinafter provided, be admitted a Fellow of the Royal Institute unless he shall at the time of admission be either (a) an Associate of the Royal Institute or a person who has passed an examination qualifying for admission to the class of Associates, or (b), a Licentiate who has passed such examination or examinations as may from time to time be prescribed by the Council as a qualification for the admission of Licentiates to the class of Fellows. Provided, however, that the Council shall have power to elect and admit as a Fellow any architect who shall have attained the age of thirty years and shall have been engaged as a principal for at least seven successive years in the practice of architecture as to whom the Council may resolve that it is desirable to elect and admit him as a Fellow."

Clause IV. authorises the Council to deal with the question of professional education in the following terms:—"Subject to the by-laws for the time being the Council shall formulate, and from time to time alter and amend, a scheme or curriculum for education in architecture, and may appoint, in relation thereto, such boards or committees (whether or not consisting wholly of members of the Royal Institute) as may from time to time be prescribed by by-laws, and the Council may apply the funds of the Royal Institute in making provision for and furthering and developing any such scheme or curriculum, and in providing for lectures or teaching, and for the holding of examinations in accordance therewith, and for granting certificates in connection therewith, and (subject to such exemptions as may be allowed by or in accordance with the by-laws) no person shall in or after the year One thousand nine hundred and thirteen become entitled to admission to the final examination for Associateship of the Royal Institute unless he shall have passed through a course of study under, or in accordance with, such scheme or curriculum, and shall have passed such examinations in relation to the subjects comprised in that course of study as shall from time to time be prescribed by or in accordance with the by-laws." Among the proposed amendments to the by-laws a change occurs in the method of election to membership of the R.I.B.A., it now being required that a candidate shall be supported by twelve Fellows and Associates, of whom not less than seven shall be Fellows. Clause 26 directs that Diplomas and Certificates shall be granted to every Fellow, Associate, and Licentiate who is entitled thereto. Clause 27 concerns the *personnel* of the Council, in future it is to consist of not more than forty members, namely, the President, four Vice-Presidents, an Honorary Secretary, eighteen Fellows as members of Council, and four Associates as Associate members of Council. In addition there are to be two Past-Presidents of the Royal Institute, the Presidents of the three societies within the United Kingdom in alliance with the Royal Institute, "which on the 31st December of the year preceding the election contain the largest number of members of the Royal Institute," and the Presidents of six other of the societies within the United Kingdom in alliance with the Royal Institute selected in rotation. Important amendments were proposed with regard to Education and Examination in Architecture, in regard to which Clause 44 reads as follows, viz.:—"The Council shall annually appoint a Board of Education to deal with the education of pupils in architecture, and to conduct such examinations as are required by the Royal Institute under the provisions of any Act of Parliament or of the charters and by-laws. The Board shall not exceed fifteen in number and shall consist of such subscribing members of the Royal Institute and such other persons as the Council may invite, including representatives of such teaching institutions as have accepted, or may accept, the scheme of the Council."

It is also provided that the Council may "on the advice of the Board, appoint examiners and visitors in the United Kingdom or in any Dominion, Colony, or Dependency of the British Crown, and shall make such regulations in respect of their appointment and in regard to the payment of fees and expenses as they may from time to time determine."

As a condition precedent to the final examination, it is enacted that (after 1913) every candidate for the Associateship, before presenting himself for the final examination, shall have either (a) passed through the course prescribed under the scheme adopted by the Council as above, or (b) proved to the satisfaction of the Board of Education that he has been otherwise properly trained as an architect. Finally, the forms of declaration to be signed on election to membership of the Institute by (1) Fellows, (2) Associates, and (3) Licentiates, have been very carefully and judiciously amended.

THE SOCIETY OF ARCHITECTS

Travelling Studentship, 1909.

Twenty-five sets of designs have been received in competition for the Travelling Studentship, which is of the value of £25, and carries with it the silver medal of the society. The subject set this year was a secondary school, the details of materials and cost being left to the competitors. The council have awarded the studentship to Mr. Chas. H. Hudson, of 12, Almeida Street, Islington, N., an assistant in the office of Mr. A. W. Roques, M.S.A., 10, Basinghall Street, E.C., and in view of the high merit of some of the designs and the number of competitors, they have awarded a special prize of the value of £10 to Mr. G. Ll. Evans, 29, Bridge Avenue Mansions, Hammersmith, W., an assistant in the office of Mr. Arthur W. Sheppard, A.R.I.B.A., 43, Chancery Lane, W.C. The drawings will be on view at the society's premises, Staple Inn Building, Holborn, W.C., for one week, commencing June 7th, when admission will be free. Afterwards they will be exhibited in various provincial centres.

THE A.A. DINNER.

The Architectural Association members' dinner took place in the Georgian Hall of the Gaiety Restaurant, on Wednesday last, the president, Mr. Walter Cave, occupying the chair. Amongst those present were Sir William Richmond, R.A., Sir A. Brumwell Thomas, Messrs. Ernest George, T. G. Jackson, R.A., Reginald Blomfield, A.R.A., E. A. Abbey, R.A., Solomon J. Solomon, R.A., H. Greville Montgomery, M.P., W. H. Seth-Smith, E. Guy Dawber, H. T. Buckland, J. A. Marshall, John Murray, Henry Tanner (president-elect), Gerald C. Horsley, R. Frank Atkinson, H. P. G. Maule, Stanley Hamp, Maurice E. Webb, A. Needham Wilson, G. B. Carvill, C. Wontmer Smith, Arthur Keen, Ian MacAlister (secretary R.I.B.A.), A. H. Ryan-Tenison, Ellis Marsland, G. Northover, T. Frank Green, T. L. Dale, Herbert Batsford, G. E. Bond (President, Society of Architects), A. D. W. Pollock (Master of the Plumbers' Company), H. C. Cole (President, Surveyors' Institution Junior meetings), A. Fincham (President, Clerk of Works Association), and many others.

Mr. T. G. Jackson, R.A., in proposing the toast of "The Architectural Association," spoke of the great interest he had always taken in the Association which, at one time, was the only body undertaking the systematic training of architects. It put teaching before examination; and he thought that that was specially commendable, for the idea that examination and education were the same thing was a fallacy. Examinations were falling into discredit very generally. At the Universities they were constantly spoken of with disrespect, and Fellowships at Oxford and Cambridge were given as a rule to men who were thought deserving of them. When Sir William Richmond and he had the honour of belonging to the Council which reorganised the Royal College of Arts, they decided, as the first thing, that a student should not be examined, but that a certificate should be given as the result of a general review of the work of a whole year. Examinations frequently enabled an inferior man to get through by a chance, while a superior man was unlucky and did not show what he was capable of. Mr. Jackson made some observations on the value of sketching and studying, and said it was their greatest pleasure as artists that the means of getting their livelihood should be also a means of getting pleasure. He related a story told by Mr. Briton Riviere. A distinguished artist came upon a young man painting a landscape. After looking at his work and commending him, he asked him what he made by his work in the course of a year. "Oh, about £150 altogether," said the young man. "£1,150!" said the great artist, "that is not a bad sum." "£150, not £1,150," corrected the young man. "But," said the great artist, "there is £1,000 for the pleasure of doing the work; I always put it down at that in my accounts, and I congratulate you upon a fair income."

Mr. Cave, in reply, thanked Mr. Jackson for the double honour of being present that night and for sending his son to their schools, which he thought was a great compliment. The schools were going strong, and he thought they were turning out as many architects as they ought; some might think too many. Their greatest difficulty was to provide an education suitable for a very varied class of men. There were men who came to them with a public school or university education, equipped with the power of learning; and others, younger men, full of enthusiasm, but without the same faculty of acquiring knowledge. This problem had the earnest consideration of Mr. Maule, their headmaster. They were also considering methods of finding out as soon as possible whether a man was fitted for the profession, and, in the case of a man who was not, letting him know in good time that he had better start at something else. The president then referred to the extinction of the building debt, the altered arrangements regarding the "Sketch Book" which, in future, would be in the hands of Messrs. G. C. Horsley, Theodore Fyfe, and Curtis Green, and paid a tribute to Mr. Lewis, who for eighteen years had carried on the work in connection with it. The remarkable growth of the atheletic club during his term of office would, he hoped, induce everyone connected with Association to be present at the annual sports to be held at Stamford Bridge on June 5th, and it was interesting to note the large number—about half the day school—who were in the Territorials. In conclusion, the President thanked the Councils who had worked with him during his years of office, and the staff with Mr. Driver at their head. Though he thought it was a relief to relinquish the responsibilities, yet when the time came he felt a certain regret. Passing the chair was passing a step in one's professional life. He commended Mr. Henry Tanner, the new president, to them; he was well-known to everyone; he had been an active member for six years, holding office in various posts. No one was better qualified to take up the work and carry it on properly. The Association would be in the best hands, and he wished it all success under Mr. Tanner.

Mr. Henry Tanner, in proposing the toast of "The Royal Institute of British Architects," coupled with the name of Mr. Ernest George, its president, said the relations between the Association and the Institute had always been most cordial. The Institute had shown a parental interest by moral support, and what was perhaps more important, by financial support. The annual donation from the Institute had been very helpful, especially while they were labouring under the incubus of the building debt. The Institute had helped them with the "Sketch Book," and with the Architectural Museum. Though this list seemed formidable, he was bound to say that if the Institute gave them money they gave the Institute men. They could see the number of Association men, not only in the Institute membership, but in high positions in the Institute. Mr. Tanner referred to the wide interests of the Institute and the important and valuable work which it did, and later referred to its excellent financial condition, having £26,000 of invested funds. He hoped they would soon spend that and more on erecting new premises to house the Institute—not forgetting, however, to save a little for the Architectural Association. No doubt he was suggesting trouble for some unlucky architect who got the job of designing the building; it was trouble enough to

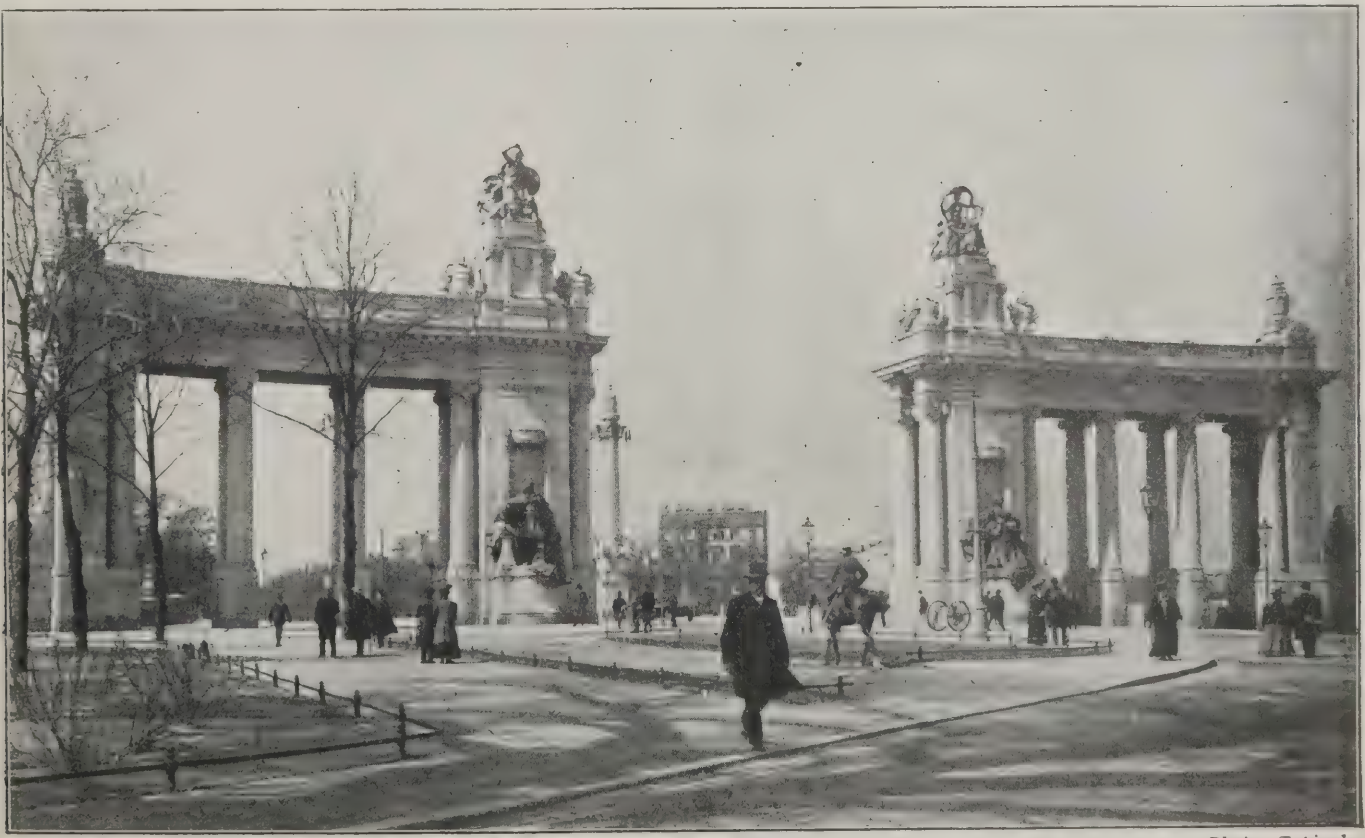


Photo: Topical.

ENTRANCE TO THE NEW CHARLOTTENBURGER BRIDGE, BERLIN. — A RECENT EXAMPLE OF GERMAN CIVIC ARCHITECTURE.

deal with the ordinary client, but he could not imagine what it must be when the client was an Association of Architects. He recommended the successful architect to consult Mr. Leonard Stokes.

Mr. Ernest George referred to the bond of sympathy between the Association and the Institute, and congratulated the students on the fine opportunities of a good training that they now possessed—training of a character which was unknown when their elders were young. There was nothing of the kind when he was a pupil. Then they would enter the Royal Academy as students for the fun of competing for medals, but there was no Architectural School. There were lectures—lectures from exponents of Gothic or exponents of Classic, these being two strongly divided camps. It was not, he thought, until Mr. Phené Spiers returned from Paris that the idea of a teaching school was acted upon. He hoped, however, that teaching would not entirely supersede apprenticeship for the old method of entering an office and dealing with practical work from the outset was always profitable. The construction of a farmhouse taught as much architecture as the construction of a temple. He thought it desirable to study those larger views, for the English ones were generally small; we wanted something more than the answering of economic requirements.

Sir Brumwell Thomas proposed "The Guests," coupled with the name of Sir William Richmond. He thought that future generations of mosaic workers would have reason to be grateful to Sir William for the patience and the care in preparing his colour treatment for the tremendous problem involved in the decoration of St. Paul's. His skill, patience, and many years of his artistic life had been devoted to this, one of the most important works of modern times. Sir William might truly say with that great forerunner of the Renaissance, Leonardo da Vinci, "Thou, oh God, dost sell to us all good things at the price of labour." Mr. T. G. Jackson brought the gift of scholarship to the practice of architecture. He had created an enormous number of collegiate and ecclesiastical works, both within and without his University of Oxford, which had given great pleasure to his admirers. The President of the Institute was always welcome to them. Mr. Abbey, in his early career an accomplished illustrator in black and white, had developed into a great decorative painter. The only criticism that he had to make was that his large decorative schemes, such as the wonderful "Quest of the Holy Grail," all seemed to go across the Atlantic. He hoped that might be remedied. Mr. Solomon had painted a long list of ideal pictures, commencing with "Cassandra," and "Niobe," and perhaps the greatest of many "Samsons." This year he had a portrait in the Academy of the Prime Minister, who told Mr. Solomon that he had taught him the virtue of immobility. He hoped if Mr. Solomon ever painted a portrait of the Chancellor of the Exchequer he would instruct him in the same virtue—at least, when preparing budgets. Professor Blomfield was one of the authorities on Education in Architecture, and would permit him to mention one point in connection with architectural education that they might well adopt. He hoped it would be possible to institute a course—it might be a diploma course—for men who were anxious—and there were a number of men in the Association who were anxious—to go on with academic study. They pursued a course of education up to a point and then left them to their own devices. By this further course he thought they would benefit by the enthusiasm of these men, and create also a more national enthusiasm for architecture. They had with them also Mr. Montgomery, who when he was not working for the general benefit of the British nation, was assisting the interests of that portion of it engaged in architecture and the building trades by his excellent Exhibition. There were a number of others—all of them heartily welcome. It was the age of pageants; his was a sort of pageant, and many of the characters were old friends and distinguished artists with a common aim in the pursuit of truth and beauty.

Sir William Richmond said some of the other distinguished artists around him should have been asked to reply to this toast; but the opportunity had been afforded him to say something that he would like to say. He had had, probably, opportunities of travelling around the world which they had not, and they might not know that one of the great points of ancient architecture was, it was invariably coloured. He would like to tell them of some of the examples of coloured architecture he had seen in ancient works and with his own eyes. In the city of Salamis, destroyed 300 years B.C., he had seen colour so beautiful—so gray, so blue, so black, and so brown—that while not interfering with the structural outlines of the architecture, it seemed to have performed the act of embracing with the sky. He had seen colour in Athens on the Propylea and the Parthenon; he had seen in Egypt, in the tombs, never intended to be seen again by mortal man, colour applied to architecture and to sculpture with exquisite results. Until a certain period in the history of architecture there was no building in our good country of England that did not receive colour upon the majority of its surfaces. Non-coloured architecture was entirely a modern one—absolutely a modern one. And why? The Arts had become divorced. The painter said, "I will stand on my own legs; I will put my picture in frame; I am *facile princeps*; I will have nothing to do with an inferior art." And the architect had retorted, "I am the structure; I do not want coloured eyes or coloured hair or anything else upon me. I am the skeleton, and I will be that and nothing else." What was wanted—architects desired it as well as painters—was an absolute coalition among themselves—the architects, the sculptors, and the painters. After all, architects were the masters of the three arts, and the movement must come from them. If they desired to make the best of buildings something like that must be done. "You are young," continued Sir William, "I am old—I will give you advice. If you want a piece of sculpture do not get it because it is cheap. If you cannot afford to pay a good price for carving a capital do not carve it at all. If you cannot afford to pay the price for a good piece of decorative painting, do not go to a firm. Those firms who turn out things *ad nauseam*—absolutely *ad nauseam*—are the very devil. Architects have matters in the very palms of their hands. Seek out young sculptors, seek out young painters, train them according to your will within your rigid lines. Appeal to them sympathetically. Do not treat them as slaves; give them, not license, but liberty under your restraint, and in time to come you will have educated a school of art combining architecture, sculpture, and painting, as good as anything the world has ever seen. In that way and in that way alone, we may have again a great National art in this country, such as existed in Italy, France, and Greece—which will exist here if we unite our energies."

The first annual dinner of the past and present pupils of Messrs. Parry, Blake and Parry, is announced to be held at the Criterion Restaurant, W., on Thursday, May 27th.

* * *

Messrs. Hampton and Sons, in conjunction with Messrs. Humbert Flint, will offer for sale at the Mart on June 14th, an extensive area of building land at Stanmore, within 10 miles of London, containing approximately about 800 acres. It comprises the Bentley Priory, Stanmore Park, woodlands, and the Manor House estates, and carries a present rent-roll of about £10,000 per annum. Portions of the property have already been developed. The whole will be put up with an "upset" price of £275,000, but if not sold as a whole, the income-producing portions, ground rents, etc., will be offered in 70 lots.

ARCHITECTURAL COMPETITIONS: SOME SUGGESTED REFORMS.

By T. Faulkner Shepheard.

Abstract of a paper read before the Liverpool Architectual Society,

The Waste of Effort.

One of the most eminent architects of the present day is reported to have said that he went into eighty competitions before winning one, but that he learnt something from every one of them. But, after all, the aim of competitions is not mainly educational. However, one cannot help thinking, in looking over most exhibitions of competition drawings, that a great deal of the work is waste. One sees scheme after scheme that is absolutely impossible from the first drawn line. Even the paper is wasted. I should say that in most competitions sixty per cent. of the schemes can be deleted at the assessor's first careful scrutiny of the plans. All these schemes are probably elaborately and very well drawn out to ⅛in. scale, possibly a large ½in. detail and perspective sketch—all waste: a great deal of it perhaps not the fault of the competitors; it may be due to misleading conditions, or of a bad start leading unconsciously on to further error. It is nevertheless waste work, and much of it avoidable waste.

How long can the profession as a whole stand the expense of it all? The number of competitors increases with each succeeding competition. Drawings seems to get more and more elaborate, to catch the assessor's eye; and so we go on. There must be an end to this making of useless drawings.

The Cost to the Profession

in a year must be enormous—out of all proportion to the remuneration at stake. Take a typical case of, say, a job to cost £10,000, with 100 competitors. Each set of drawings must, at a very low estimate, cost £10. This is a cost to the profession of £1,000. The winner gets £500 after he has done all the usual work involved, such as working drawings, detail drawings, specifications, supervision, etc., etc., for which alone his £500 is not over-adequate pay. How long are we going to stand it? For we, the architects, must be the people to rectify it. The general public have not the least idea of the amount of labour involved. They do not know; and if they did, why should they bother their heads about it as long as we complacently acquiesce?

Why should there not be a

Preliminary or Selective Competition

for all works in open competition, or, for that matter, for all competitions, such preliminary competition to comprise plans to 1-16th scale—*plans only*, or at any rate no more than plans and diagram sections showing heights of floors; no elevations whatever. If you allow elevations at all in preliminary competitions they must be done as well as may be, and that therefore labour is not saved, but additional labour is involved, for some of the work is done twice over. I consider 1-16th scale drawings quite enough to enable the assessor to judge finally of a design, especially if they are, as is generally the case, supplemented with a detail. From these plans a percentage would be chosen for the final competition. This is no new scheme. I know it has been used several times. But why should it not be adopted in all cases? After all, the plan is of first importance. If the plan is bad, of what use are the most beautiful elevations?

Of course I know that each competitor in the preliminary will have to scheme out his elevations—probably to draw out a great part of them; but he will not have to make

Elaborate Show Drawings

of them, and so a good deal of labour will be saved. Let the chosen few elaborate their drawings as much as they like. If a scheme is worth illustrating, it is worth illustrating well; but if not, why illustrate it? If the plan is really a good one, and the scheme well thought out, a good architec-

Photo : Topical.

THE NEW CHARLOTTENBURGER BRIDGE, BERLIN. A RECENT EXAMPLE OF GERMAN CIVIC ARCHITECTURE.

tural design is always possible, given some ability on the part of the author. Of course plans of nearly equal merit would be chosen from the preliminary. The number chosen need only be limited by merit; and the assessor will be saved the heartburning effect of a fine piece of architecture with an impossible plan.

Essays Towards Betterment.

A great deal is being done by various architectural societies towards bettering the system on which competitions are conducted. But the societies would have greater power still for the furtherance of the good of the profession in every way, and for the furtherance of our art, if they were backed by the whole of the members of the profession. Much, however, has been already done; assessors have been appointed in cases where the promoters of competitions had originally not intended to employ them. It is quite unnecessary to dwell on the importance of this point; one has but to think of how difficult it must be for a layman to grasp the meaning of drawings, and how far even an architect can be lead astray by tricky draughtsmanship and showy perspectives, to decide instantly that it is absolutely essential to appoint a trained man to assess a competition. But we want to insist on more than that; and that is, that this assessor shall be appointed from the outset, and shall be employed to assist in drawing up the conditions of the competition. I understand that the Liverpool and Manchester Societies have jointly in hand the preparation of model conditions—a very excellent scheme; which should be of great help to assessors, and to promoters of competitions generally. At present the conditions in many cases are obviously not drawn up by anyone having adequate knowledge of the data required by architects in order that they may compete on an equal footing. In fact, the winner in many cases is the man who happens to select the right part of them to override or to ignore; while much waste labour and much heartburning are caused to the unsuccessful competitors who have done their best to abide scrupulously by the conditions laid down.

The Indispensable Assessor.

What I have said applies more particularly to advertised competitions. In smaller matters, it is more difficult to insist on the point. Take a man who wants a house built. He does not know whom to employ, but comes to the conclusion he will ask four or five architects to send him designs. He thinks he knows what sort of a house he requires, and that he is quite well able to choose for himself. Here again we come to the same difficulty of the layman's grasp of drawings. It would surely be very much fairer to the competitors if he had some skilled adviser to help him in his choice, and very much fairer to himself, probably, if he only knew it, and to the public who happen to pass by after the house is built. The observation applies to many cases—shops and their fronts, office buildings, even warehouses—but how persuade this man of the fact?—especially as it means his spending so many guineas of his hard cash to get such advice. Could not this form of advice be given by the Society free of charge—say, the Council and officers of the Society to form a body of advisory honorary assessors to take it in turn to give skilled advice in such cases? Work thus distributed would not be found very heavy; and I think that the practice, as it became more generally known, would be a great boon to the profession and to the public generally.

The Jury Method.

And now I come to the vexed question of assessors. There is a great deal of difference of opinion as to whether there shall be one assessor or more than one appointed. I think that—certainly for larger works—more fairness can be obtained by the jury method; each jury including one or more architects, while, if necessary, experts in other lines could be called in to assist the one who has drawn up the conditions to arrive at his final decision as to the best scheme submitted. I know that, so far, the jury system has not always been conspicuously successful; but I think that failure has been mainly due to the improper composition of the jury. Why should not such a jury be chosen from the number of the actual competitors themselves? Who can know better than they the actual difficulties of the problem in hand? Why, then, not use their knowledge? Let them be chosen by vote by the competitors sending in designs; the number of the jury being in proportion to the number of entries, say a jurv of four in the case of 20 entries, of six for 50, of eight for 100, and of 10 for 150; the jury to meet together to adjudicate with, say, a representative of the promoters of the competition, and if need be an expert (such as, say, a medical expert in the case of a hospital), under the chairmanship of the paid assessor who organises the competition. It would be easy to choose this jury. Every competitor could have a list of the names sent to him, upon which he could mark off the required number, the list so marked to be enclosed with his design when sending in. The paid assessor would of course prepare everything for the meeting, have the designs conveniently arranged, and do all checking of cubes and prices required, etc., etc., so that no time should be needlessly wasted. I do not see how any one of this jury could unfairly push his own design; for even if he had the temerity to try to do so, he would have all the other competitors to deal with. That any unfairness could creep in through collusion is utterly incredible, and almost impossible. And even if it could not be expected of all of them to recognize and praise merit in a design not of their own making, at least they would be able, and I daresay not unwilling, to point out defects; and so, if nothing better, we should have a number of devil's advocates upon the board, who, by a system of exclusion, might conceivably arrive at a very satisfactory result. The idea seems to be worth some consideration; I have heard it discussed a good deal privately, but should much like to hear a more general opinion on the matter. Personally, I think that with a carefully considered system of voting, with a different number of marks for 1st, 2nd, and 3rd places, such a system might cure most of the drawbacks of the present system of assessment.

Some Minor Points.

Just a word on one or two other small points. As to premiums. Why should the premium be merged in an architect's commission? I take it that premiums are intended as some sort of recognition of the extra labour involved. If so, then why not pay them? Or if it is thought too much to give the winner both the job and the premium, why not give the money to the 2nd, 3rd, and 4th men placed? At present, say, premiums of £100, £50, and £25 are offered, a total of £175. The £100—more than half the sum—is really never paid, except when the work is not proceeded with. And here let me say that corporations and committees are perhaps rather apt to rush into a competition before making sufficiently sure that the work will be proceeded with; and abortive competitions surely involve a scandalous waste of the profession's time, or, if I must not grumble at that, then a scandalous waste of their money as ratepayers.

Another small point is

The Question of Deposits.

I think it only reasonable that the promoters of competitions should require some guarantee of the bona-fides of an applicant, and the practice of demanding a small deposit represents a very workable method; such deposit to be refunded if the conditions are returned in a stated time, or upon the receipt of a genuine set of drawings. But I read of a case the other day in which the promoters had refused to refund the deposit. Surely it is rather much to demand a fee to look at the conditions just to see whether they are reasonable. This is an abuse about which we must grumble, and, if need be, kick.

Competitions give a splendid chance to real merit, if only they are properly conducted. It is of no use to sit tight and say that although things are bad they might be worse. If we quietly acquiesce they will speedily get worse. Look how much more prevalent it is now not to offer any premiums as recognition of extra labour. If we go on competing under such conditions, the natural assumption is that such premiums are not necessary. Then, again, you find schools offered for competition with 4 per cent. down as the architect's commission—a thing that is absolutely against all our articles of association, to say nothing of the poorness of the pay. The public do not know the amount of work a scheme entails, and the more extra work they find we will put up with, the greater will become the burden they will impose upon us.

Views and Reviews.

Ruined and Deserted Churches.

Ruined and Deserted Churches. By Lucy Elizabeth Beedham. London: Elliot Stock, 62, Paternoster Row, E.C. Large crown 8vo, cloth gilt. 105 pages, illustrated, price 5s.

The author holds the faith that "the works of man, especially his architectural triumphs, are most beautiful in old age and decay." Whether or not this proposition is sound—and the case obviously admits of argument and disputation—it is certainly what a churchman would call "comfortable doctrine" for the author and her readers, for it makes for sympathy with the subject. But the pictures in the book hardly support it. They are well enough chosen for the illustration of the subject, but from our point of view they do not strongly support the theory. Such admiration as they extort from us is mingled with pathetic regrets for their ruination, and occasionally with contempt for the vandals who have turned them to base uses. On the other hand, there is consolation in observing that in many instances in which a beautiful fabric has unavoidably fallen into ruins, the fragments have been lovingly and reverently preserved. The ruined churches are not all utterly deserted; and that the deserted churches are not all ruined, many an unappreciated preacher could testify. Many a venerable church or chapel of the Norman period has been turned into a barn, especially in Cambridgeshire. The author has made good use of the historical and legendary associations that cling to old buildings, nor has she failed to appreciate the architectural interest inherent in the subject.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
June 1	MOLESEY ISOLATION HOSPITAL. The East and West Molesey U.D. Council invite competitive plans, with specifications for the above. Full particulars can be seen at the Council Offices, Dundee Villa, East Molesey.
June 4	COTTAGE HOSPITAL, BODMIN. Architects are invited to submit competitive designs for the above, to be erected at an approximate cost of £2,000. Premiums, £12 12s., £8 8s., and £5 5s., for the three sets of plans *which the Committee may select.* Premiums of selected Architects to merge in Commission. Site can be seen on application to Henry D. Foster, Hon. Secretary to the East Cornwall Hospital, Bodmin, from whom particulars are to be obtained.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading, Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second, and third respectively.
July 9	STOKE-UPON-TRENT. Additions to Town Hall including large hall to seat 3,000 people, police court, etc. Premiums of £100 and £50 for second and third designs respectively. Assessor nominated by Pres. R.I.B.A. Conditions and particulars from Jno. B. Ashwell, Town Clerk, Town Hall, Stoke-on-Trent,
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	WALLASEY U.D. COUNCIL. CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

Grimsby Town Hall Extension.

The R.I.B.A. having intimated to the Corporation that if an assessor was not appointed before the competition drawings were sent in they must advise their members not to compete, the Corporation have appointed Sir William Alfred Gelder, F.R.I.B.A., of Hull, to that position.

Rivelin Valley, Sheffield, Competition.

The report of Alderman Styring, Messrs. William Terrey, Edward Holmes, Assoc.M.Inst.C.E., E. M. Gibbs, F.R.I.B.A., and P. Marshall, the committee of assessors appointed in the above competition, has been presented to the Corporation Water Committee. The competition, limited to architects practising within 30 miles of Sheffield, was for laying out the estate here belonging to the Corporation. Only 11 designs were received, the first premium of 20 guineas being awarded to Messrs. J. Creswick, Brameld and Son, of York Street, Sheffield; and the second premium of 10 guineas to Mr. James Miller, A.R.I.B.A., of Smalldale, Bradwell. The assessors state: "We have endeavoured to bear in mind the desirability of preserving the natural beauty of the entire valley, interfering as little as possible therewith, consistent with the development of the remainder of the estate for building purposes; the laying out of the main roads in such a manner as to afford the best connection with the existing main roads; the practicability of such roads as regards gradients and easy access; and the ultimate commercial development of the estate.

"It is evident that the competitors have given a good deal of thought and time to the consideration of the plans, although, generally speaking, the competitors have not in any single plan given effect to the whole of the general principles referred to, and consequently there is no particular design we can recommend the committee to adopt as indicating the best manner in which the estate may be developed; but would suggest that an endeavour be made to combine the best features of several of the designs sent in."

New Academy, Hamilton.

The Glasgow Institute of Architects has intimated to the Hamilton School Board that if the Board do not give further effect to the recommendations of the Institute, the members will be advised to abstain from participating in the competition for the new academy, which is to cost £30,000. The Board has agreed to appoint a professional assessor, and to fix at once the fees of the architect, but decline to publish the name of the assessor until the competitive plans have been delivered.

Secondary Schools, Shrewsbury.

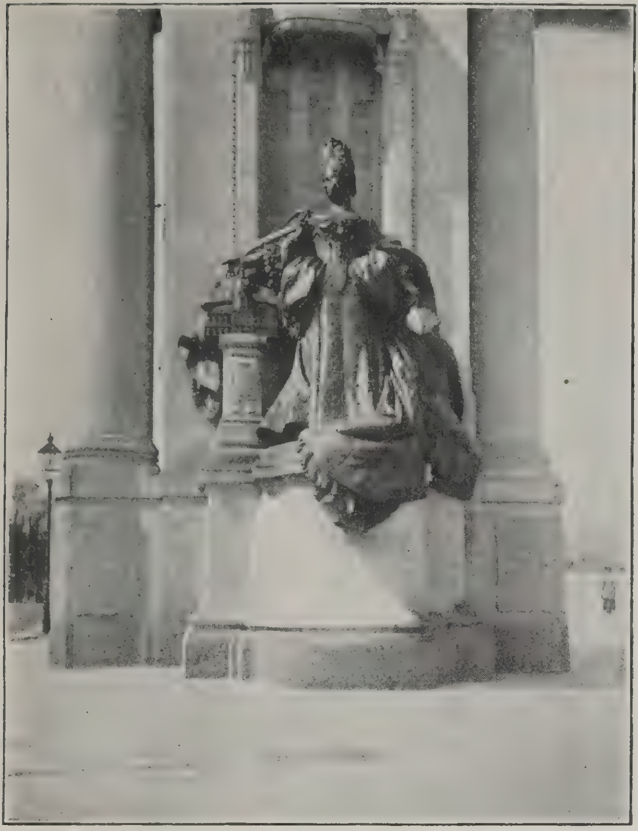
In this limited competition, which was assessed by Mr. Henry T. Hare, F.R.I.B.A., the plans prepared by Messrs. Frank H. Shayler and James A. Swan, joint architects, were placed first. The schools are to provide accommodation for 200 boys and 200 girls, and the cost is estimated at £15,000.

Middlesbrough New Public Library.

At the recent meeting of the Free Library Committee it was reported that the assessor commenced his inspection of the designs submitted on Thursday last. 202 sets of plans have been received, and arrangements are being made to put them on exhibition in the town hall.

Elementary School, Aberbeeg, Mon.

The education committee of the Abertillery Urban District Council are advertising for the submission of competitive plans for an elementary school to be built on the Ty'r Graig site near Aberbeeg, providing accommodation for 320 infants on the ground floor, and 430 boys and girls (mixed) on the first floor, together with an estimate of the cost of carrying out the scheme. "They also" (we quote from the official advertisement) "invite tenders for the provision of the necessary plans, specifications, estimates, and bills of quantities, and the supervision of the works. The lowest or any tender not necessarily accepted, and no premium will be paid for the competitive plans, unless the tender accompanying the successful plan (if any) prove to be prohibitive, in which case the committee will reserve the right of using the plan on payment of a premium of 10 guineas. A plan of the site may be seen, and, if desired, copied, on application to the secretary. Tenders and plans, sealed and endorsed, to be in the hands of the undersigned by Wednesday, June 3rd, 1909." We have seen many unusual announcements concerning competitions, but this is the most extraordinary we



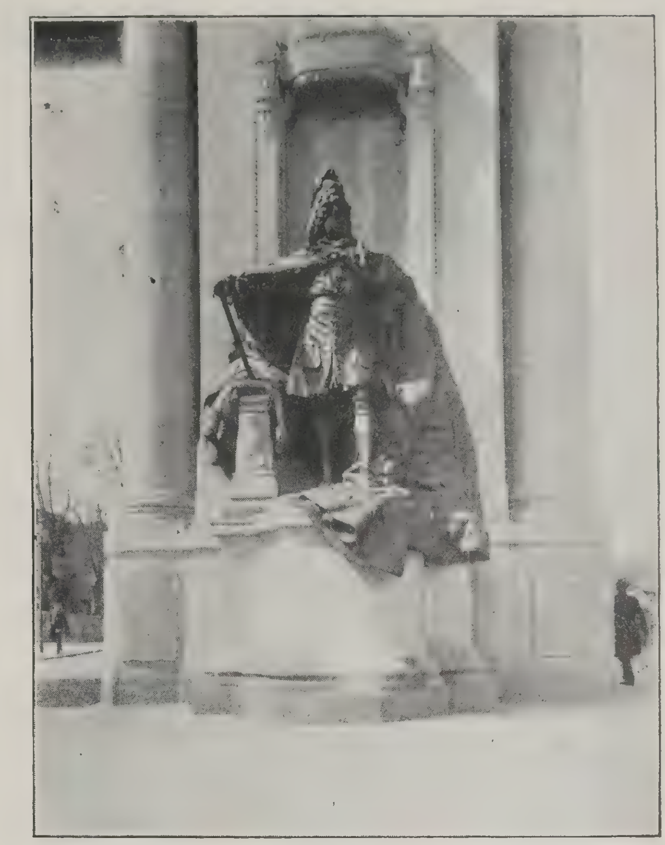


Photo: Topical.

Statue in bronze of Queen Sophie Charlotte, wife of Frederick I.

Statue in bronze of King Frederick I. of Prussia, Founder of Charlottenburg.

THE NEW CHARLOTTENBURGER BRIDGE, BERLIN: A RECENT EXAMPLE OF GERMAN CIVIC ARCHITECTURE.

have ever read. The terms of this advertisement are so unusual, not to say obscure, that we hesitate to comment upon them, lest it turn out that we are labouring under some misapprehension as to their import. We take it that the successful architect is to receive no premium for plans unless the accompanying tender happens to exceed the committee's unstated limit; but we do not understand this mixing of the several functions of the architect and the contractor. Is it a local custom? What is the nature of the tender required? We should like to be assured that there is no attempt to set up a competition among architects as to the amount of their fees.

Royal Southern Hospital, Liverpool.—New Out-Patients' Department.

Messrs. Haigh and Thompson, who were recently placed first in the above-named competition, take exception to part of a sentence in our issue of May 28th, which they think is open to misconstruction:—" . . ., though whether the significant clause in the conditions requesting the architect to state his fee in the report accompanying his work was the determining factor, we hesitate to say." We are informed by them that the usual fees are charged, viz., 5 per cent. for the architectural work, and 2½ per cent. for quantities. An independent quantity surveyor has been appointed.

The passage of which the words quoted form part, comments solely on the apparently restraining influence which this particular clause in the conditions seemed to exercise on all the elevations; it was purely general, and had no reference to any particular competitor or to the fees stated in the reports accompanying the designs.

In view of the Daylight Saving Bill it is interesting to note that Messrs. George Wragge, Ltd., art metal workers, etc., of Salford, have adopted the system in their works, with the general approval of the workmen concerned. The directors and staff, recognising the advantages, have also resolved to adopt the scheme in the offices.

In Parliament.

By our Gallery Representative.

Imports of Joinery.

In the House of Commons, Mr. Tennant, secretary to the Board of Trade, has informed Mr. Tyson Wilson that the value of imports of "house frames, fittings, and joiners' work" into the United Kingdom from foreign countries was in 1906 £251,590, in 1907 £200,126, and in 1908 £191,996. From British possessions the imports were in 1906 £21,359, in 1907 £24,470, and in 1908 £17,636. Those figures include the imports of doors, windows, and other framed work.

Crown Royalties on Slates.

Mr. Hobhouse, secretary to the Treasury, in reply to a question by Mr. Ellis Davis, stated that the Crown royalties on slates were in nearly all cases charged in the form of a percentage on the sums realised by the sale of the slates. Consequently they rose and fell with the fluctuations of the market, and when prices were low lessees got the benefit of an automatic reduction. The whole question of the royalties on the principal Crown quarries in Carnarvonshire was very carefully and thoroughly gone into by the Commissioner of Woods five years ago, at the request of the lessees. The case of each quarry was considered and dealt with on its own merits; considerable concessions were made, and the lessees united in expressing their appreciation of the fair spirit in which their applications had been met.

THE BEACHCROFT RESERVOIR.

Sir Melvill Beachcroft is immortalised. A reservoir has been called by his name. He thus gets a monument which, if not "more enduring than brass," is at least not so "unstable as water." The reservoir thus distinguished is that at Honor Oak, in south-east London. It is notable among its kind as being "the largest ever constructed at one time and under one contract." Also the clay for the sixteen millions of bricks employed in its construction was dug from its own bowels; the reservoir, 824ft. long between the walls, with a maximum width of 587ft., occupying an area of about 14½ acres. Sir Melvill, therefore, is the godfather, as it were, of no mean reservoir. It is certainly not an ignoble, and it need not be an altogether hopelessly prosaic way of perpetuating a name. Springs, wells, fountains, streams, being ceaseless sources of inspiration to poet, painter, and sculptor, are intimately associated with imaginative conceits and legendary lore. But the reservoir is a more practical and perhaps more forcible appeal. It stores the means of cleanliness and health and energy of many forms of life itself; and Sir Melvill Beachcroft, as ex-chairman of the Water Board, and as present chairman of the London County Council, and as a scholar of refined tastes, is in a position to appreciate both the utilitarian and the not unromantic aspects of the well-deserved compliment that has been paid him, as the representative of a family that, as Mr. E. B. Barnard, M.P., observed at the inaugural ceremony of the reservoir, has been for three centuries actively interested in the government of London. "It had been," said Mr. Barnard, "an hereditary tradition of the family to give the best they had unstintingly for the public service: and no member of the family had done it with greater generosity, prestige, or success than Sir Melvill Beachcroft."

Mr. Wm. Nicholson, of the firm of Messrs. Wm. Nicholson and Sons, Ltd., contractors, of Hunslet, has been adopted as the Conservative candidate for South Leeds. Mr. Nicholson was born in 1865, is the son of the late Mr. Wm. Nicholson, of Belmont, Hunslet, and a grandson of the late Mr. Wm. Nicholson, of Burley Grange, Leeds. He has already represented the ratepayers as a member of the City Council, and done valuable work as chairman of the Highways Committee. Two years ago he was president of the National Federation of Building Trades Employers of Great Britain and Ireland.

SECONDARY SCHOOLS: THEIR PLANNING AND EQUIPMENT.

By G. Topham Forrest, M.S.A., Architect to the Northumberland Education Committee.

Abstract of a paper read before the Society of Architects, May 13th.

A little over a year ago, Mr. Forrest read before the Society of Architects a paper on the Planning of Elementary Schools, dealing with the subject from the standpoint of Part III. of the Education Act of 1902. On the present occasion he dealt with Part II. of that Act, where it is enacted that local education authorities shall consider the educational needs of their areas and take such steps as seem to be desirable to supply or aid the supply of education other than elementary.

The time has now come when secondary schools are receiving due attention, and the present appears to be a good opportunity for the consideration of the various matters connected with the planning and erection of these buildings.

Preliminary Data.

In most competitions for secondary schools, and where work is entrusted to architects in private practice, fully drawn up rules and regulations are now invariably issued by local education authorities, and intending competitors are informed as to the methods of classification, the sub-divisions of classes and questions of organization, so that the architect before commencing with his plans has a clear idea of the conditions under which education is carried on under the authority to whom the plans have to be submitted. He can study, therefore, very closely the question of routine and organisation in that particular district, which is (needless to state) of the utmost importance in securing the best possible plan.

Matters relating to the size of cloakrooms, the amount of hanging space necessary for each scholar, the number of closets required, etc., have already received their quota of discussion and need not be repeated here. These and similar matters are dealt with fully in the building rules issued by the Board of Education. These rules should always constitute the architect's *vade mecum*, although committing them to memory must be regarded only as a means to the end, as efficiency can only be acquired by practical every-day experience.

The term "secondary school" is of wide application, and covers educational institutions of very different aim and type. It is applied to the city grammar school, the city high school, the modern commercial or technical school, and the residential school. Strictly, the name should be confined to those schools which educate pupils who have passed the primary or preparatory stage, and whose age is approximately thirteen to eighteen. But the majority of secondary schools have preparatory departments and undertake the education of the young from the age of seven.

Secondary schools are divided into two classes (1) Residential or Boarding Schools, (2) Day Schools. In the former, for a considerable part of the year, the school performs the double function of a school and house; and in the latter (which is the subject of this paper), the school merely shares with the home in the process and responsibility of education.

Always avoid a long narrow site. One approximately a square is more acceptable for a school, for it should be remembered that ample space on all sides of the building is necessary.

Type of School Favoured.

Whether a new scondary school shall be a school for boys or girls only, or a mixed or dual school, is a matter for the educationist to decide, and depends to a large extent upon the population of the district and the provision already existing.

Accommodation and General Principles to be Observed in Planning.

Generally speaking, a secondary school can be commenced with a minimum of accommodation, viz., classrooms, hall, science and preparation rooms; and such things as cookery and manual training rooms, gymnasium, art rooms, etc., can be added afterwards.

In small secondary schools, it is sometimes arranged that one science room is made sufficient for the whole of the science teaching in the school; but for a secondary school of any size, at least a chemical laboratory, a physical laboratory, lecture room, preparation room, and dark room are required.

In some English counties a new system of arrangement has recently been tried with great success. Some directors of education do not agree with the system of taking theoretical work at one time and practical work at another. They believe that the students get a more thorough grasp of their subject by combining the two parts in one lesson. This system is working well, I understand, and the science teachers after trying it like it. With this view all the science benches are so arranged for the students, and are made so that they serve as tables for taking their notes, the students using stools to sit on during the theoretical portion of the lesson, and during the practical work placing the stools under the benches. Whether sinks and reagents are required to each bench depends upon the extent of the chemistry course, but in ordinary secondary schools it has been found sufficient to have these on the side benches only.

The physical laboratory can be adapted for electrical work if the requirements of the school need it. In boys' schools, magnetism, electricity, and mechanics are generally taken in this room; and in girls' schools botany, as well as the ordinary physics course. A good balance room should always be provided, and fitted with slate benches set perfectly level for balance work.

A preparation room is required, with easy access to both physical and chemical laboratories. This should be fitted with a good sink, shelves for reagents, and either a separate draught chamber or access to one of the draught chambers in the chemical laboratory.

With regard to the art room, excellent results in lighting can be obtained by adopting the principle of the ridge-and-furrow roof where it has not been possible to get a direct north aspect.

As to cookery rooms, these should be large and airy, preferably at the top of the building. Good scullery accommodation is also required.

The manual teaching room is better on the ground floor, or isolated, owing to the noise. Practically no fittings are required beyond benches, tool racks, and work cupboards.

In girls' schools, three changing rooms are required, one for the mistress, one for the girls, and one for the other teachers. The girls' room should be planned contiguous to the cloakroom, so that they can change their garments after playing hockey, etc. Arrangements should be made for swimming baths when money will permit. The head mistress's private room, cloakroom, lavatory, and changing room should be *en suite*.

Hot water to lavatories should always be supplied from the kitchen fireplace, and a hot cupboard to dry clothes should never be omitted. Lead flats if possible should be used for growing plants.

With regard to a room for needlework, if the school curriculum is so arranged that there is always needlework in hand, a special room should be set apart for cutting out and drafting, and fitted with long tables on trestles; but very often this subject is taken in the dining room, and many lady principals are of opinion that a geography room is more important than a room for needlework, fitted up with places for maps and apparatus. Note that an optical lantern must always form part of the equipment of this room.

In dual schools, be sure to keep departments common to both sexes in the centre of the building, thus obviating overlapping.

With reference to the classrooms, the sixth-form room should always adjoin the library, and should have direct access to the room. In some schools, the two rooms are divided by a folding partition, thus allowing them to be thrown into one. Where a gymnasium is provided, it should have a gallery for scholars; and if the gymnasium is situated outside, it is best to make the changing rooms sufficiently large and easy of access from the playing fields.

Assembly Hall.

It is always desirable to have a principal entrance for the general use of the school entering direct into the assembly hall for public functions, etc. This section is usually set apart for the office, head master's or head mistress's room, committee room, etc. With regard to the assembly hall itself, it is not desirable that it should form a passage way. This point is important. The hall should be ample enough to seat the whole of the pupils, with a good margin to allow of sufficient seating accommodation for prize-giving and entertainments, etc. Six square feet per pupil should be taken as the minimum allowance, and any further space will prove of great advantage. If the hall is used as the gymnasium, provision should be made for the storage of chairs. Side lighting should be in all cases the rule, as it makes the question of ventilation much easier. One end of the hall should be wainscoted so as to allow of names being painted on, and so prevent those horrible wall boards so often seen.

Science Rooms.

No special rule can be laid down for fitting up the science rooms of secondary schools, as the size and character of the school must be very carefully considered in determining the requirements, but there are certain general principles to be observed in laboratory planning, and a neglect of these may lead to the production of a laboratory apparently perfect on a cursory examination, yet so defective that to conduct ordinary work therein is a matter of considerable difficulty.

First and foremost, laboratories should be capable of expansion and modification. (2) Fittings should be so disposed round the room as to minimise the unavoidable movement of pupils. (3) The arrangement of benches, etc., should ensure ease of supervision on the part of the instructor, and (5) The storage accommodation should be ample, and wall space should be left for additional fixtures.

These five considerations should be constantly kept in view, and no fitting should be introduced which to any great extent tends to subvert them. With regard to the general structural nature of the rooms, the laboratories should be lofty, and either top lighted or the side windows so planned that the sill is at least 6ft. from the floor. By this means no wall space is wasted, and the light is better diffused. The walls should be wood panelled to a height of 6ft. to enable all apparatus to be easily fixed and easily moved. Glazed tiles or bricks, though admirable as far as light and ease of cleaning are concerned, are a disadvantage when change of fittings is required. It is perhaps superfluous to remark upon the necessity for perfect rigidity of the flooring, the ordinary system of joists and flooring boards being quite inadequate.

Chemical Laboratory—General Arrangement.

The main desideratum in a chemical laboratory is plenty of room for the students to work. The working benches are either single or double, but single benches have the advantage that all students face the same way, and so are under better supervision, but they are very extravagant as regards space. Wall benches are bad, and should in all cases be avoided, only when space is extremely limited should they be employed. They obliterate all the wall space and leave no room for cupboards and other fittings. Gangways between benches where students work should not be less than 6ft. For a single row 4ft. will suffice. Each student will require a minimum bench space of 3ft. 6ins. by 2ft.

A considerable space should be left clear in front of the demonstrator's table so as to afford room for the students to assemble to receive collectively any remarks from their demonstrator. It is always a decided advantage if perfect symmetry can be secured as an aid in securing the orderly issue and disposal of apparatus and reagents, and reduces the need for movement in the laboratory. In the accompanying sketch the bench sinks are common to four students, and provide precisely similar accommodation for all. Again, the fume closets for general use are symmetrically disposed, so that each student would know which he is expected to use.

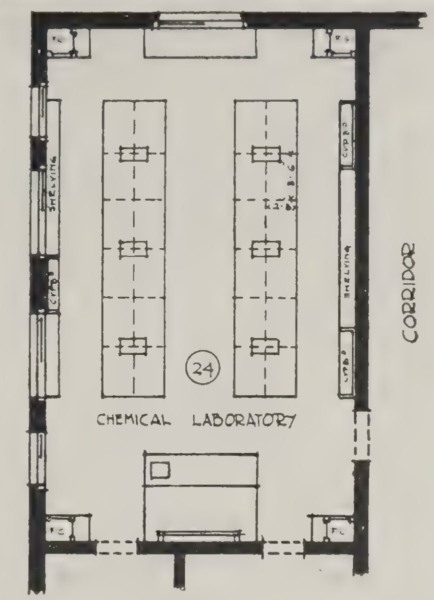
For the same reason reagent shelves other than those on the benches should be placed symmetrically about the room, and not all collected into one position, so that no student has to move far to secure any reagent that may be required.

Before the best method of fitting up the benches can be determined, it is necessary to know to what degree the chemical teaching is to be carried. For instance, a very simple form of bench would suffice for a school where few of the pupils would proceed to analysis. At one school I know of they have benches with a plain top arranged for four students; and while a gas jet is supplied to each pupil, there is one tap for water and a sink placed at each end which serves for two pupils. There is no partition in the centre (this form being out of date), but a row of white glazed tiles on which to stand bottles. This arrangement is suitable for elementary work, but would hardly be sufficient for a school where there were advanced pupils.

With regard to the detail for bench fittings, each pair of students should have at hand one water nozzle, fixed about 2ft. above the level of the sink, one side nozzle for filter, pumps, etc., one nozzle for condensers, two gas nozzles, terminals for electric current, one balance in a solid and well-made case, one receptacle for rubbish (broken glass, etc.), and space for bottle. If reagent shelves are used on benches, all gas nozzles, electricity terminals, etc., should be recessed under the shelves, raising them on a wood fillet from the bench level. The working space is thus entirely unencumbered, and glass apparatus is not liable to be broken by being pushed against a projecting gas nozzle. In planning the lockers beneath the benches, regard should be paid to the maximum number of classes likely to use the laboratory. With regard to the drainage, the V-shaped trough is the most satisfactory. This may be made of 1 or 1¼in. red deal boards joined so as to form a V trough about 6ins. deep, and having projecting fillets to prevent splashing. The trough is thoroughly caulked with a mixture of pitch and tar put on hot. This trough collects the drainage from the sinks, and delivers it into a sludge box. The overflow from the sludge box is delivered into a similar trough laid in a chase in the floor, which conveys it to the downspout outside. The gas pipes should be of ample bore, and the pressure good, otherwise when many burners are in use at the same time the supply will not be sufficient.

Physical Laboratory.

The main desideratum in the physical laboratory is a table free from vibration and of sufficient width to allow of a student being able to place his apparatus in the proper position. The narrow single bench which many prefer in a chemical laboratory should be avoided. Separate tables suitable for four students should be used, say 8 ft. by 4 ft. It is always advisable to leave the bench tops unencumbered. With this object in view, gas taps, etc., should be placed in a row at the ends of the tables, and all tables should be fitted with cupboards underneath. It is not necessary to lay on a water supply to the students' benches; two wall sinks with heaters and drainage boards will as a rule be sufficient. Every physical laboratory should contain a large stock of small drawers, say 12in. by 3in., for the purpose of storing the innumerable small appliances in constant use. Lever handles to the doors of the cupboards should be used, as the ordinary piece of hardware is often difficult to unfasten, and leads to shaking, and perhaps injury to sensitive apparatus within the cupboard. All cupboards should have flat tops and glazed doors.



Lecture Room.

The lecture room should be readily accessible from both the chemical and physical laboratories. A space should always be left at the back of the room for a lantern stand, and another on the right on the lecture table for the use of a lantern in optical work. It is a good plan to fit the front of the lecture table with glazed cupboards. If the "Kelvin" sliding blackboard is used, see that the pulley wheels are of large diameter. The small ones in common use render the board difficult to move. The electric service employed for adapting the electricity from the supply mains to experimental purposes is all-important, and requires careful consideration from every point of view before the plant is laid down and wiring fixed. It is important that the wires should be accessible, and not embedded in the walls. The electric service, however, is of too wide a scope to deal with in this paper.

Desks.

The single desk is the type recommended in the case of secondary schools, and most of the single desks have lockers, though this is not insisted upon. Three different sizes are generally obtained, to allow of pupils of different heights and ages. Adjustable desks with complicated mechanism are not as a rule found to work satisfactorily. In one high school for girls the seats or chairs varied in size to suit the desks, and were all separate and not attached to the desks in any way. Some people object to this, but at this particular school the head mistress liked the pupils to be able to move their chairs and sometimes have them close to the desk and sometimes further away from the desk. She also found it a great convenience to be able to take all the chairs from the classrooms to the hall, when that room was required for a concert or large meeting. The gymnastic mistress went round at the beginning of each term to see that each girl had a desk and chair of the right height. Whatever system is adopted, special care should always be paid to securing desks of practical construction, and to their satisfactory placing in the classrooms, inasmuch as the order and discipline in a school are very materially dependent thereon.

Ventilation and Heating.

As the ventilation of a building or school is such a complex question, it is not advisable to discuss the question in a general paper of this description. Whether mechanical or natural ventilation is most suitable is largely a matter of opinion, as there are many strong advocates of both systems. Of course there are always schools in which the introduction of mechanical ventilation is quite unnecessary. Except in the heart of large cities, secondary schools for both boys and girls are generally situated in the outskirts, or at all events in the better quarters where nearly always large open spaces can be easily obtained. In these schools it is not really required. Further you have in these schools some 25 to 30 pupils only in a classroom with a much larger cubic content per child than in the case of an elementary school. All this goes to help the ventilation, and renders it less necessary to resort to mechanical means.

The choice of an efficient heating system for a school is always a difficult matter, but experience has taught that all things being equal there is nothing to surpass the ordinary low-pressure hot water system, provided the radiating surface is properly calculated and allowed for. I have never yet seen a properly installed low-pressure heating installation fail, or give the least trouble. Consequently, I have adopted this system almost without exception, on account of its economy and efficiency. I am of opinion that the architect should invariably get out his own heating scheme with detailed specification.

Artificial Lighting.

In secondary schools situated in large towns liable to fog, and where work is carried on in the afternoon or evening, the question of artificial lighting becomes one of great importance. Now that the medical inspection of school children has become compulsory it behoves the school architect to see that the doctor shall have no good reason for tracing cases of visual fatigue to defects in the lighting of the school premises.

Up till quite recently it is surprising how relatively small an amount of consideration has been given to the problem of artificial illumination in schools. The general question as to whether gas or electricity is the more suitable illuminant for a school is a large one, but the lecturer prefers incandescent gas.

The even distribution of light is the underlying principle which governs the correct application of artificial illumination. This is essentially so in schemes of interior lighting. To attain this end, endeavour should be made to follow as far as possible the distribution and characteristics of daylight illumination, namely, downward and oblique direction, steadiness of the light, and broad diffusion in order to avoid sharp and deep shadows—not, however, seeking to eliminate shadows entirely, as these by forming contrasts are helpful and materially assist the eye in its judgment of the form of objects.

In all forms of artificial illumination, the intrinsic luminosity or the intensity of the brightness of the luminous surface should be kept as low as possible, or in other words the surface from which the light emanates should be as large as possible because—(1) The strain on the eye will be as small as possible; (2) the shadows will not be deep, and the difference between light and shade will be reasonable.

Eminent lighting authorities lay down the rule that the maximum allowable luminosity should be below five candles per sq. in. of illuminating surface. Obviously this means that some method of diffusing the light, either by means of shades or globes, should be adopted wherever the radiant is directly in the field of vision, so that the diffusing surface may be within the limits of a comfortable working intensity.

The amount of gas consumed by an inverted burner should be always carefully adjusted, so as to get the best results, and if the pressure of gas in the street mains is a varying one; either a volumetric governor of the size necessary to pass the requisite amount of gas should be fitted on each burner, or a pressure governor should be fixed on the meter. In some districts the pressure in the street mains varies as much as 50 per cent., so that without some governing arrangement it is manifestly impossible for the burner to give its best and most economic results.

General Principles.

In concluding, I may be pardoned if I lay stress on the necessity of designing schools from within rather than from without. To sacrifice the interior so as to get an external effect is insincerity in architecture. It may mean inconvenience to those who use the building, and often results in insanitary conditions prejudicial to body and mind.

Appropriateness in design is the correct aim in art, and this arises where the design is the natural outcome of the purpose for which the building is intended. The present-day public elementary council school, clean and excellent as it is, if somewhat bare, offers quite sufficient contrast to the homes from which most of the children come, and is therefore well adapted to give them a start on the road to a higher standard of living; but to children, especially girls, accustomed to the refinements of a cultivated home, plain utilitarianism in the erection of a building is likely to present a forlorn and forbidding appearance; although it may and indeed does cost more to make a handsome building, there ought to be set against this the fact that refined and artistic surroundings have a high educational value. Therefore the necessity for a due observance of strict simplicity and practical utility in their erection should not and must not prevent the endeavour being made to render the school as a whole, and the several rooms in particular, pleasing to the eye both in form and appearance, whereby there will be called up in the minds of both teachers and scholars agreeable and pleasurable sensations, which may in a measure contribute to exercise a stimulating and exhilarating influence on their faculty of taste and artistic sense. So much is spent nowadays on teaching art directly that some allowance might be made for influences of this kind which are none the less strong because imbibed unconsciously.

Buildings in Progress and Completed.

ABOYNE.—The new church shortly to be opened here is estimated to have cost £14,000. Messrs. Fryers and Penman are the architects.

CRAIL.—The foundation stone of a new Presbyterian Church has just been laid. Mr. J. Cairns is the architect.

DUBLIN.—Another Carnegie library, absorbing a sum of about £10,000, is now in course of erection. The building, from designs by Mr. Charles J. McCarthy, is in the Georgian or eighteenth century style, and has a frontage of 100ft., and a depth of 84ft.

ELAN VALLEY.—A new school, erected by the Birmingham Corporation, has been formally opened. The building consists of an assembly hall to seat 200, with three class-rooms, cloak-rooms, etc. A feature of the building is the reinforced concrete water tank contained in and forming part of the tower. This supplies the school with water, and is capable of temporarily supplying the village in case of emergency. The contractors were Messrs. Henry Lovatt, of Wolverhampton, and in addition to the school buildings their contract included permanent workshops, offices, and cottages. These are in connection with the Birmingham Water Supply Works. All the buildings are constructed of local stone rubble, with dressings of Yorkshire grit-stone. Messrs. Buckland and Haywood-Farmer, of Norwich Union Chambers, Congreve Street, Birmingham, are the architects.

FARNWORTH.—The new Town Hall just opened, which, together with the land and furnishings, has cost £11,341, has been erected from the designs of Mr. W. J. Lomax.

HUCKNALL.—Swimming baths from the designs of Mr. Fred Rowntree, F.R.I.B.A., of London, have been opened here. Messrs. J. A. Munks and Son are the builders.

LONDON, E.C.—A sum of £135,000 has been already expended upon the new post-office building in Newgate Street, and it is anticipated that another £100,000 worth of work will be done during the present financial year. After this, a further sum of £77,000 will still be required. The new power station at Blackfriars, upon which nearly £50,000 has been spent, will, it is hoped, be completed this year. Progress is being made with the construction of the new branch post office at South Kensington, the new Western District post office, and the enlargement of the Western District parcel office and telephone exchange. A new post office is to be built at Blackheath, and new sorting offices at South Lambeth, Stoke Newington, and New Southgate.

LONDON, E.C.—The new building of the Northern Assurance Company (Limited), the site of which has a superficial area of approximately 9,000ft., has been erected at the junction of Coleman Street, Moorgate Street, and Lothbury, and is faced with Aberdeen granite. It is of melancholy interest to note that both the original architects—Mr. E. W. Mountford and Mr. E. A. Gruning—died while the work was in progress. Their places were taken by Mr. F. Dare Clapham and Mr. H. Alexander Pelly respectively.

LONDON, W.C.—Extensive alterations to the Hipprodrome, including the construction of a sliding stage, which will be double the size of the present one, will, it is stated, necessitate the discontinuance of performances until August Bank Holiday.

NOTTINGHAM.—It is believed that a great improvement will be effected by the erection of a large building to be known as "Westminster Chambers," upon a site fronting Upper Parliament Street, Wollaton Street, and Theatre Quadrant. The building, of which Mr. A. Harrison Goodall is the architect and Mr. G. A. Pillatt the prospective builder, is to be in the modern Renaissance style.

PETERHEAD.—The estimated cost of the new post office building, designed by Mr. James Watt, is £5,000.

KNOWLE.—The Bishop of Clifton recently laid the foundation stone of a new church to be erected here. The site has involved an outlay of £600, and the edifice itself, designed by Messrs. Pugin and Pugin, of London and Liverpool, will probably cost (exclusive of benching) another £4,500. Messrs. Stephens, Bastow and Co., of Bristol, are the builders.

PONTYPRIDD.—The new Y.M.C.A. building now in course of erection is estimated to cost £12,000. The design is by Mr. Vernon Hodge, the winner of the competition which was open to all practising architects in the country.

RENFREW.—A new asylum is now being erected at Dykebar, from the designs of Mr. T. G. Abercrombie. It comprises ten main blocks of buildings, and is estimated to accommodate about 300 patients. The cost will be close on £100,000.

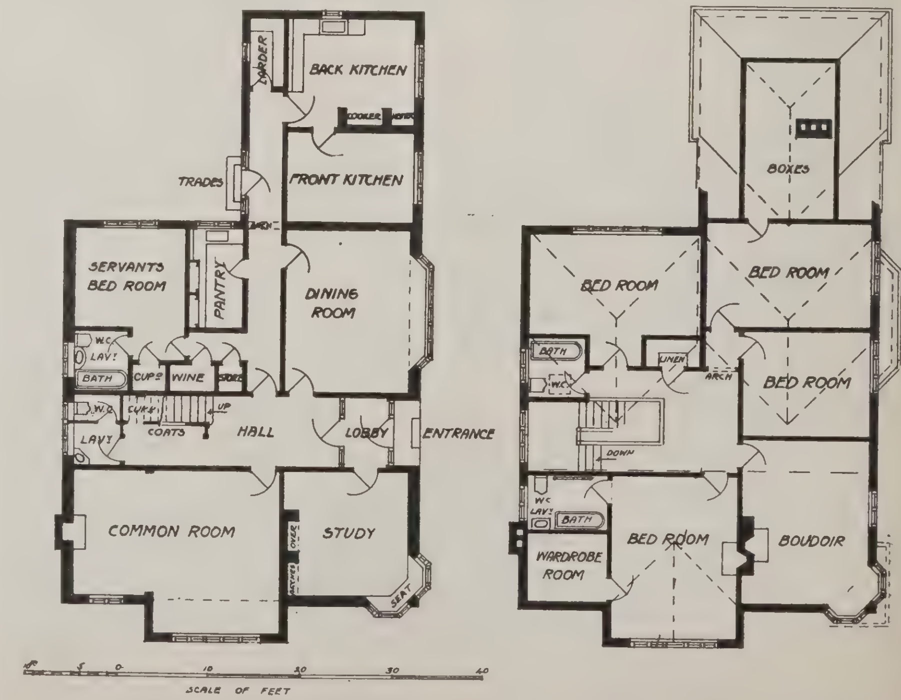
SUDLEY.—The new church now in course of erection here will cost £7,500, and is to accommodate about 700 worshippers.

WEMYSS.—The foundation stone of the hospital now being erected at Denveath was recently laid by Lady Eva Wemyss. The hospital, which is a memorial to the late Captain R. J. E. Wemyss, is to cost about £6,000.

Our Plate.

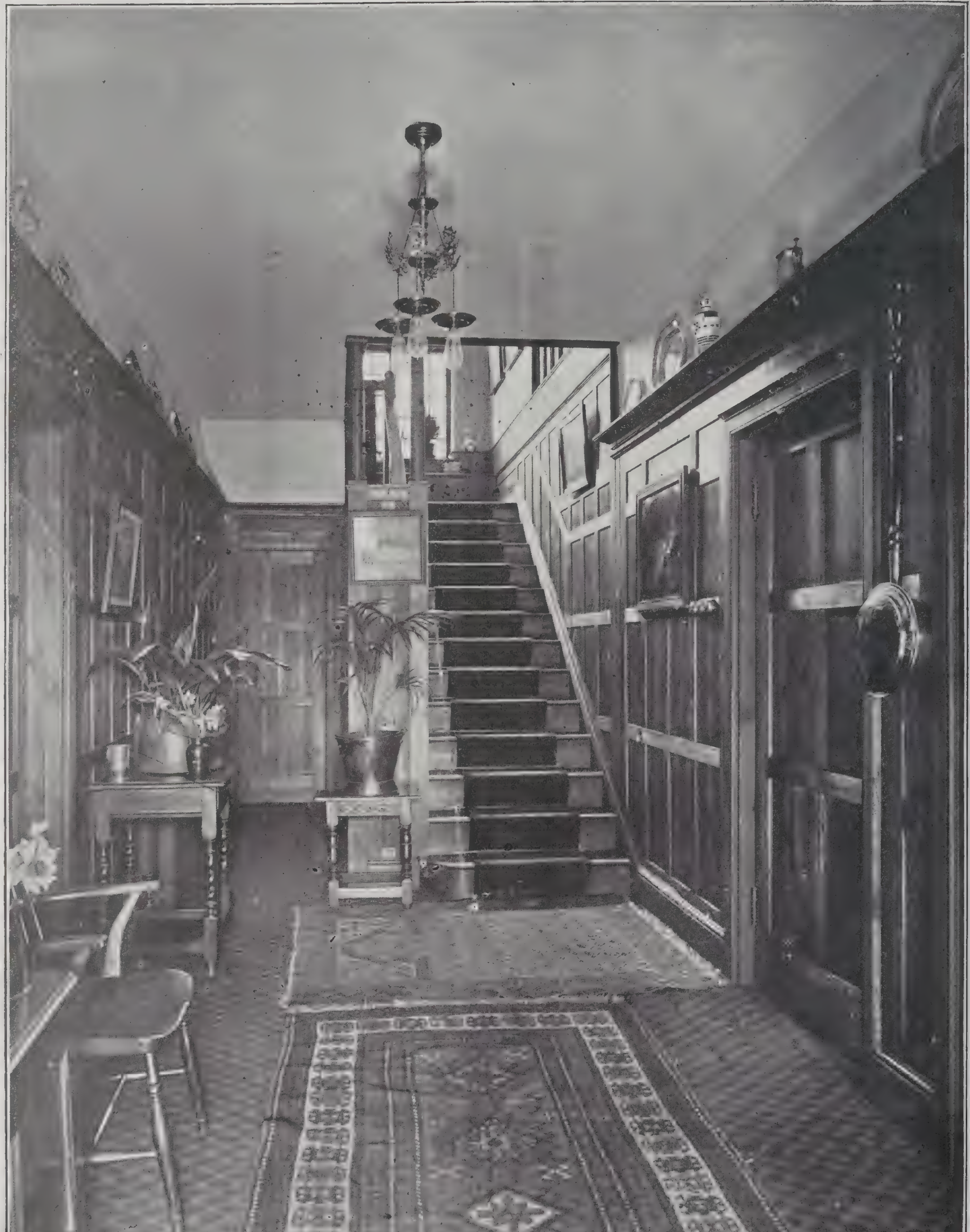
House at London Road, Chelmsford.

This house has been built on an angle site for Mr. F. H. Crittall, J.P., the idea of the place being that it should be very easily worked with a small staff of servants, so that it can be at any time shut up and left. The owner was very largely responsible for the general arrangement of the plan. There are only three fireplaces in the house besides the kitchener, and these have been installed more for appearance sake than for real utility, as the house is heated by hot water radiators. The servants sleep downstairs on the ground floor, and have their own bath-room, etc. Externally the walls are faced with rough-cast and the roof covered with hand-made tiles. The woodwork, both inside and out, is finished with two coats of Carbolineum. Internally the detail is of the very simplest. Mr. Jesse Gowers, of Chelmsford, was the builder. The casements and metal lathing came from the Crittall Manufacturing Co.; the heating and sanitary work were executed by Messrs. Crittall and Winterton; and the electric light fittings by Mr. Amer Fenn.



HOUSE, LONDON ROAD, CHELMSFORD. C. H. B. QUENNELL, F.R.I.B.A., ARCHITECT.

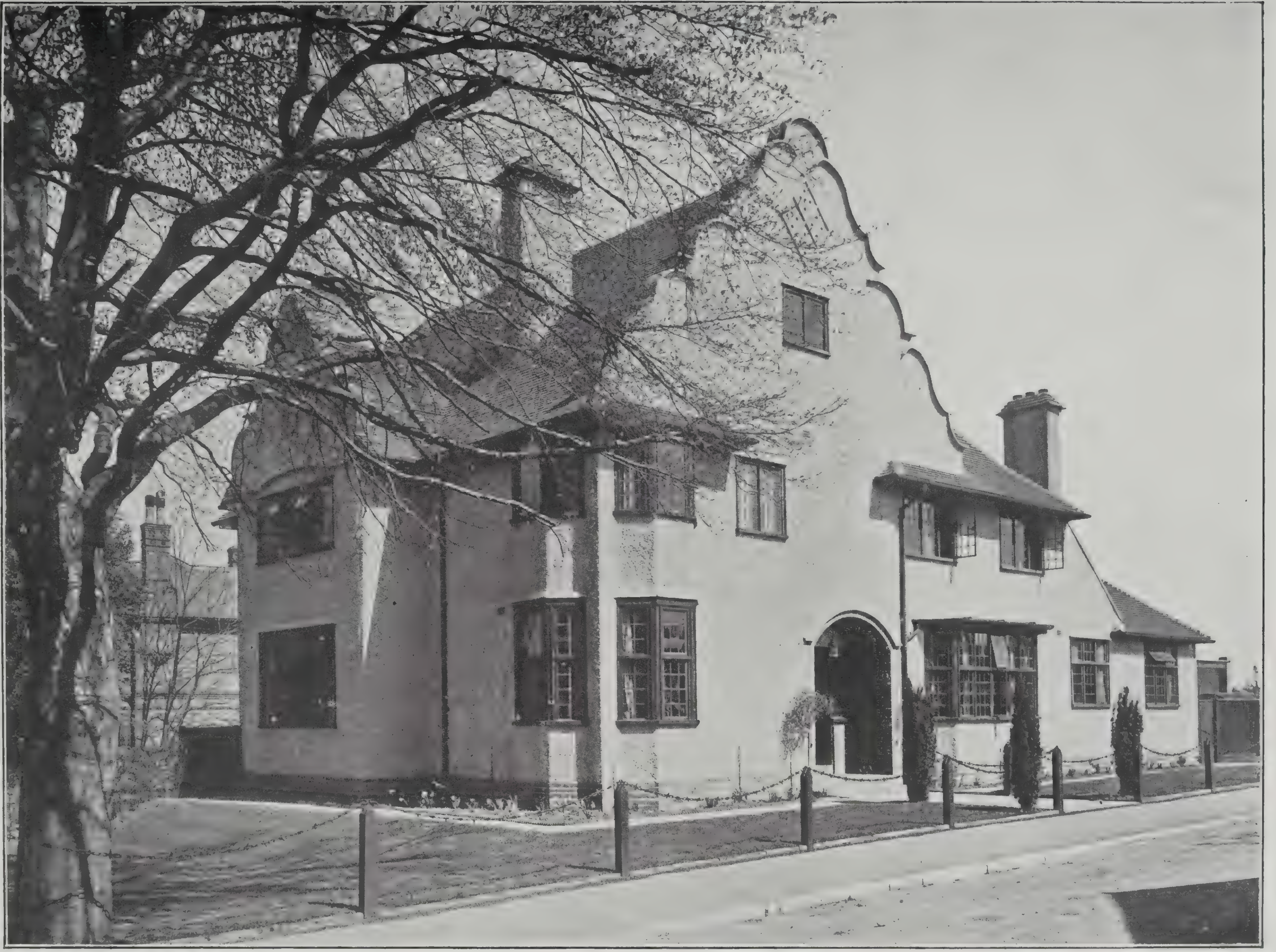
LIBRARY
OF THE
UNIVERSITY OF ILLINOIS



The Hall

HOUSE AT LONDON ROAD, CHELMSFORD.

B. QUENNELL, F.R.I.B.A., ARCHITECT.



General View.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

A NEW THEORY OF PLANS.

By Max Judge.

The philosophers, if they believe in anything, at least believe in relations between hings. For some of them the relation whereby the things related manage to exist, is the only real thing. Relation, too, dominates the unphilosophical mind in many of ts processes; witness the fascination of any old thing, and, more to our immediate purpose, any old house, which sets up an unconscious rumination on its associations with those who have in the past used its echoing rooms and rambling corridors. There the associations—the relations with quite unknown persons it may be—have become the real thing. Without going so far as the philosophy implied above, we can at least say that without this fascination the house would have no particular meaning to us.

It does not require that the actual history of the house in question shall be known—the mind at once creates movement to correspond with what is based on movement. It will create romance to fill romantic positions, and t will not be lacking in imagination appropriate to the ins and outs of any old town or country mansion. In other words, what we have been trying to suggest is that it is the very *plan* of a house which creates the relations with its inhabitants, which in their turn give the place its meaning to us.

That is the explanation of many peculiar effects wrought by old haunts upon hypersensitive minds.

We shall discover on reflection that all this follows from the simple fact that it is the two-dimensional diagram (the plan) which is all that is necessary to suggest our normal movements. We may look on the front of an old-time mansion without receiving any of he impressions derived from a tour of the several floors. All the elevation can do is o take into account our third dimension of height, and as the staircase is the only instance of our moving through *two* planes at once (of which all the essentials can be represented on the plan), an elevation fails o give us any relation with those connected with it. It is only the plan that can do hat. An elevation is at the most the exernal expression of a series of superimposed plans and the most successful elevation is rightly adjudged to the one that manages o give most expression to those plans. It equires some special known fact to give individuality to a window, for instance, in elevation—that blood-stained aperture in Whitehall, let us take, and that only gives us he one moment of the scene, no movements before or after.

Virtually, in fact, we only follow our movements through two dimensions (one plane), which accounts for the reason that a map or plan has so much interest, telling us practically all that we want to know. The mind can go over the ground on paper exactly as the feet go over it in reality.

We might assume that it is the third dimenion, about which we seem so indifferent, hat gives us our existence, and that we are n theory a two-dimensional being at every point of our body, from head to foot. We ould go further, and assume that a four-dimensional body would be one normally moving through three dimensions, and that all bodies in fact must have *one* dimension more than they can fully appreciate.

It is, of course, chiefly gravitation that preludes our being concerned with *heights* in ur every-day movements. We are literally rawling on the floor all the time, and graviation goes a long way towards cancelling he prerogative of a third dimension. We ever leave the earth—the plan. A doorway nly concerns us as to the possibility of our etting through it—the concern of the two-dimensional body at the floor level. A window similarly is the concern of the two-imensional body at the eye-level.

We live in the inside of cubes, and even hat is too wide an interpretation of our mitations. We live on the bottoms of the nterior of those cubes, and the five sides are here for convenience, comfort or safety. And thus follows the absoluteness of the plan. It is the actual thing reduced to its essentials. A house erecting does not alter in relation to ourselves from the moment when the lines of the foundations are dug to the completion of each floor (each complete plan) in succession.

To sum up this brief speculation, a map or plan in theory is to us exactly what a map or plan in practice would be to a two-dimensional body. For such it would be an actual model, and in the case of our own movements a model is no more helpful to the understanding of them. Even when we consider the case of the map, where the abstract plan becomes more irregular and difficult to follow, it is possible by means of contours and shading to give a more faithful idea of a hilly country than in an actual relief map, where in order that the heights may be appreciated at all the vertical scale has to be absurdly exaggerated! Some people never seem to be able "to understand a plan," and it is hopeless to expect them to extract half the meaning from a map. But there is no difference between the two in principle.

GERMAN TOWN-PLANNING: LESSONS OF THE RECENT TOUR.

By T. Alwyn Lloyd and H. Colin Allen.

Now that the subject of town-planning is becoming one of considerable interest to us in England, the recent visit of a large party of professional men, members of town councils and others, to Germany, to study the question, came at an opportune time.

Cologne, Dusseldorf, Frankfort-on-Main, and Wiesbaden were visited in the order named, and some members of the party extended the tour so as to include such mediæval cities as Wurzburg, Rothenburg-on-Tauber, and Nuremberg in Bavaria.

The municipal authorities in the various towns received the party officially, and went to considerable trouble in every case to make the tour of inspection as profitable as possible, by affording special facilities for investigation.

Cologne.

With nearly half-a-million inhabitants, this is one of the most important industrial centres in Germany and the chief town of the Rhenish provinces.

The development of Cologne is typical of the thorough methods of town planning in Germany. The centre of the city has been almost entirely re-modelled, the old lines of fortification razed, and broad avenues made in their place. The suburbs have been laid out on a definite plan, and the main thoroughfares constructed well ahead of requirements. In this way the needs of a future population can be intelligently anticipated; in England we usually begin to think about the development of the suburbs when building has actually extended out to that point.

Cologne, for building purposes, is divided into various zones, and limitations are put both upon the height and the area covered by buildings within the zone. Thus in one zone twenty-five per cent. of the plot must be left unbuilt on, and four storey buildings are permitted—in another, there must be fifty per cent. open space, and only two storeys are allowed. As the building areas extend outwards from the centre of the city, the amount of open space round them increases. At the same time, the centre is very well provided with boulevards, tree-planted and grass-verged, and open squares, pleasantly interspersed with green spaces. These squares were particularly noticeable round the old churches in the city, and in many cases streets leading up to the churches and public buildings have been opened up, so as to afford better views of them from the adjoining district.

On the other hand, the position of the Dom (or Cathedral) is not very happy, and there is a lack of enclosure in the adjoining "places." Several proposals have been made for joining up the cathedral more to its surroundings, but its great height makes this somewhat difficult; the placing of the new central station in the immediate vicinity has not tended to assist the general grouping.

Much of the planning in Cologne is in the style of the earlier German architects, mostly straight roads, with diagonal ones, and squares at intervals. Whole districts outside the old town have been laid out in more or less geometrical shapes. This method is now recognised there as being out of date, and in the newer districts curved roads are used to a much greater extent, and great care is taken not to get awkwardly-shaped intersections of roads.

Dusseldorf.

Though situated in what is the "Black Country" of Germany, Dusseldorf, on account of its far-sighted policy of town planning, and improvement is one of the pleasantest towns imaginable. Its business men, instead of leaving it when the day's work is done, reside there and take an active part in the life of the town.

The old town, of which there are several interesting remains, was situated near the Rhine, but most of the town is quite modern, and on that account there have been fewer obstacles to encounter than in many of the other German examples, where the old fortifications have hampered a completely satisfactory development.

There are several widths of streets, according to the uses to be made of them, and the height of the surrounding buildings is largely governed by these widths.

The principal streets in the centre of the city are wide and imposing looking; many of them have double rows of trees and ample grass plots.

One of the principal promenades, known as the König's Allee, is some 250ft. wide, and of considerable length. It contains what is practically a continuous strip of park, down the centre of the road, which has a stream running through and bridges over at points where intersecting streets cross.

Dusseldorf contains a number of important public buildings, which have been placed to great advantage on the river front or in open positions in the town. Even such a utilitarian structure as the railway station has been carefully designed, and its position in the centre of the town well thought out in relation to adjoining streets and buildings.

Factories and workshops are only allowed in certain districts reserved for that purpose; they are not permitted in any district from which the prevailing winds would blow the smoke over the town.

Some of our English manufacturing centres might with much advantage to the inhabitants make regulations in the same direction.

Frankfort.

Frankfort was formerly a mercantile city, and one of considerable antiquity, but during the last forty years, its industrial development has been very rapid, and at the present time there are a large number of manufactories of all kinds there. Its great problem now is that of housing the rapidly increasing industrial population.

The city has gone in for purchase of land on a large scale. One example of this will serve to show the important bearing this is likely to have on future development. Some years ago, a large tract of more than a thousand acres of land was purchased near the river; it has been planned out as practically a new industrial town, consisting of harbour works, wharves, factories, workshops, and workmen's dwellings.

These are, moreover, placed in the positions best suited to their requirements, and the houses kept quite separate from the business quarter, with plenty of open space surrounding them. The whole scheme is joined up to the central parts of Frankfort by new, wide thoroughfares.

Having purchased the land well ahead of actual requirements, the municipality obtained it on reasonable terms, and is likely to make a profit on the transaction, in addition to having this large district properly planned and developed. Sites are now being leased or sold for factories and houses—the use to be made of each plot of ground being specified by the authorities in each case, and great improvements in the trade of the city are anticipated.

Frankfort has special regulations with regard to widths and construction of streets, which are classed as "thoroughfares," "promenades," or "ordinary roads," as the case may be. There are fine ring roads round the centre of the city, following the uneven lines of the old fortifications. It is interesting to note also that all new streets are laid out by the municipality and not by private builders.

There is a special local law connected with the planning of the suburbs. Most of the land adjoining the city was held by a number of individual owners, whose awkwardly-shaped plots would not work in well with the town extension plan. By the provisions of this law, the land is all "pooled" together and after roads have been planned, and the whole district re-arranged, it is distributed again among the landowners in its original proportions.

In Bavaria.

The extension of the tour took the party into the kingdom of Bavaria, where the following towns were visited:—Wurzburg, Rothenburg and Nuremberg.

In each of these the same cordial welcome awaited the visitors as had greeted them in Prussia, and the authorities did all in their power to explain the special features of each town.

At Wurzburg and Nuremberg, the problem has been a dual one—that of preserving an old town and at the same time, extending and re-arranging it to the requirements of modern industrial development.

At Rothenburg, the interest lay in the fact that a splendid example of mediæval town planning has been preserved, practically in its entirety.

Wurzburg.

Although it has had a most eventful history as the seat of a long line of prince-bishops, who ruled the surrounding country for several hundred years, Wurzburg has not been content to rely only on its past glories.

To-day, it is a progressive city, with an increasing population, considerable manufactories and an important university.

The interest of the plan lies in the skilful manner in which the new town has been connected up to the old, without the sacrifice of any of the distinctive features of the latter. The fortifications existed until 1866, since when the space they occupied has been laid out as gardens and plantations, which form a very pleasant adjunct to the town, and round which many of the University and public buildings have been grouped.

The new town has been well planned, and some of the suburbs are as good examples of the modern methods of town planning as were seen in Germany.

In the town extension plan, provision has been made for future industrial growth, and here again factories have been relegated to the districts from which the prevailing winds will not cause the smoke to be blown over the city.

The huge Residenz Platz is one of the most important points in the town, and from this avenues of trees and public gardens stretch out in one direction, and the main streets down to the river Main in the other. The station approach is also an imposing entrance to the town.

Rothenburg-on-Tauber.

In many ways, Rothenburg must be one of the most interesting old cities in Europe, and the way in which it has been preserved is typical of the care exercised in Germany over towns old and new.

It is an almost perfect example of a walled-in city of the Middle Ages, and is surrounded by high walls, towers, moats and gateways—a relic of the far-off times when the only consideration in town planning was that of defence against attack.

There are very few new buildings inside the walls, and only a few scattered houses outside, so that nearly all the energies of the officials are spent in preserving the old buildings in the best possible way.

Nuremberg.

Nuremberg has had to deal with the same problems as Wurzburg, only on a larger scale. Its population is now about four times as great as it was in 1870, and it is one of the chief industrial centres in South Germany.

Here, instead of destroying the old fortifications, their walls and towers have been retained and playgrounds made of the moats. The numerous old bridges crossing the river Pegnitz in different parts are also characteristic features of the old town.

When the modern industrial development commenced about forty years ago, town planning became a necessity, we are told, and the extension of the city was arranged for in good time.

Certain laws were decreed as to widths of streets and heights of buildings, and later on, to prevent the perpetuation of the usual type of attached street frontages, a more open system of building was adopted. A certain amount of ground between buildings had to be left unbuilt on. The area of this open space is governed by the height of the surrounding buildings and the width of the street.

A district in the east of the city has been allocated for villa building, on account of its favourable position, and factories are not allowed there. In other districts nearer the centre of the city, flats up to four storeys and basement are allowed, and, a little further out, only flats of three storeys.

It should be mentioned that in Nuremberg, as in other German towns, high buildings are the rule, and anything like our two storey cottage property is almost unheard of in the towns.

The streets vary in width from about 30ft. for side streets to 100ft. for main thoroughfares.

Building in the vicinity of historical parts of the old town is subject to special regulations, and where street frontages have to be altered for town improvements, great care is taken in dealing with the old buildings.

A committee of taste, consisting of five of the best architects, act as judges of all designs for new buildings or re-building in the city.

One of the few German garden-city schemes of small houses, spaced out generously, is to be seen a few miles outside Nuremberg. It is a colony of railway workers, on land belonging to the State, and the houses have been built partly by the State direct and partly by a tenants' society.

BANK OF SPEYER AND CO., BASLE, SWITZERLAND. CHARLES F. MEWES, ARCHITECT.

Correspondence.

Against Back-to-back Houses and Block Dwellings.

To the Editor of The Builders' Journal.

Sir,—I am grateful for your remonstrance against the perpetuation of back-to-back dwellings, and I think that this opposition ought to be extended to certain other classes of industrial dwellings that, I contend, are objectionable from the social, moral, and sanitary point of view.

Let me just briefly indicate the main features of some typical back-to-back houses. Some of which I have personal knowledge are built in blocks of eight houses, four in one street, and four in another, back to back, the net area of a house being, as a rule, about 15ft. by 16ft. At the end of each block there is an enclosed yard, running from street to street, and containing four w.c.'s and two ashpits for the eight houses. The washing is usually done in the basement, and the clothes are hung out in the street to dry, often to the accompaniment of rude remarks from onlookers. And does the arrangement of the sanitary conveniences conduce to delicacy and refinement?

Next as to block dwellings I have visited many in most of the large towns of England and Scotland, and I have invariably found that the moment you get inside of these large buildings you become aware of a sickly and depressing atmosphere, caused by the massing together of so many human beings under one roof. A common entrance and a common stairway to the corridors, off which the various tenements are contained, and w.c.'s serving for more than one family, do not, to say the least of it, make for comfort, leaving decency out of the question.

If land could be secured at agricultural value, plus ten per cent. for compulsory sale to local authorities, cottages for the working classes could, I am convinced, be built for £200 each, inclusive of all charges, and they could be of 16ft. frontage, with a living-room 13ft. by 14ft., a kitchen 13ft. by 10ft., a good concreted yard of not less than 200 superficial feet clear area, and a due observance of decency and privacy in the provision of sanitary conveniences.—Yours truly,

York. A Builder.

The Taxation of Land Values.

To the Editor of The Builders' Journal.

Sir,—I take it that you would prefer this question discussed from the practical or business point of view. I will endeavour to give you the ideas of a person unprejudiced by political passion.

I submit that owners of undeveloped land should be entitled to whole or partial exemption in the following cases:—

(1) "When the non-development of the land is not injurious or disadvantageous to the community." I doubt whether in all districts it is desirable to throw more land into the market than is at present there. It would tend to over-production of houses; and though it might be advantageous to ruin some landlords, to ruin all without substituting something for the landlord and tenant situation would be absurd.

(2) "When the owner can prove that he is developing at a reasonable rate." Surely, if an owner sets out an estate, divides it up on a reasonable plan, makes roads, and builds houses, and offers to sell or let at a reasonable rate, he should be entitled to some sort of exemption, or at least to more consideration than the owner who does nothing. Are garden cities and garden suburbs to be taxed on the whole of their venture at the rate of ½ per cent. on the selling value in plots? This might be a small matter to an estate from one-half to three-quarters developed, but to one just laid out it must mean ruin.

(3) "When the owner can prove that he is not in a position to develop, and offers to sell at a fair market price." It is surely an injustice that a man should be taxed on what produces nothing, and on what he is willing to dispose of at a reasonable price. The inventors of this scheme do not seem to be aware that there are places where the value of undeveloped land is stationary or dropping through no fault of the owners, and that there are persons who have become owners who, from financial or other reasons, are quite unable to develop.

As to the capital charge of 20 per cent. on the supposition that all increases in value of land, except such as the owner has made by levelling, sewering, and roadmaking, are due to the community at large or, as "The Daily Chronicle" puts it, "only the value that the people produce will be taxed," this is a mistaken notion in very many cases. Take Hindhead; the price of land 20 years ago was something like £15 an acre. It is now anything from £400 to £1,000 an acre. This is due to the efforts of the people who have built houses, laid out grounds, and advertised it, to the doctors who have written up the climate, to the artists who have praised the views, and to the discovery that a high gravel soil is the thing to live on, and to fashion. Where, however, in a near neighbourhood "the people" have congregated, although the land is just as convenient and the views are the same, the land is not of equal value, showing that in some cases the proximity of "the people" may have a lowering effect on the value of land.

The increased value of land is due to many things; what in one district will increase the value will in another lower it. The increase in the knowledge of sanitation and building amenities will improve one district and spoil another. Fashion will do the same. The residence of one countess, two eminent scientists, a popular author, and a fashionable doctor have been known to raise the land value hundreds of pounds an acre, whereas a cemetery, or workmen's dwellings, or a lunatic asylum will have the reverse effect. How can one tax such things fairly? Further, is compensation to be paid on depreciation as well as on taxation claimed on improvement? And is the countess or the doctor to have the largest share? As to the practical results of the taxation, I can only speak of districts which I know. I do not think there will be a slump in prices. Speculators will be reluctant to buy in anything but small lots for which they can see immediate prospects of development. Present large owners will hang on in the hope of better times. Weak holders may be encouraged to develop where otherwise they would have waited; and development under these circumstances generally means a drop in the standard of building. Well-ordered schemes will be more unusual, and the chaos and abomination of the jerry builder will flourish. On the whole I would have this part of the Budget passed. There is a cult or religion whose war cry is "Taxation of land values," which desires to reduce the income tax to nothing, to relieve all buildings and improvements of rates, to turn towns into gardens and marshes into fertile fields; in fact, to cure all ills; and there is nothing like a little practical experimenting to knock holes in fallacies based on theory.

An Onlooker.

To the Editor of The Builders' Journal.

Sir,—It is a pity that Messrs. Moore and Crabtree did not carry their actuarial investigations in the above matter a little further. They would then have discovered that even were Henry George's scheme adopted in its entirety, and land rated 20s. in the pound, it would still be impossible to relieve buildings altogether, as they suggest. Could this be done, however, one result, as Mr. Harold Cox pointed out in the "Nineteenth Century," would be that Chatsworth, for example, would be rated on a little more than the agricultural value of the land, while the consequent deficiency in the yield of the rate would require to be drawn from the neighbouring farmers! Messrs. Moore and Crabtree appear to anticipate a boom in the building trade as a result of a tax on land values, but I can affirm from actual experience that the Budget proposals have already put an end to some promising schemes of development by making it practically impossible to arrange the finance. Land is no longer regarded as a sound security by the banks and insurance companies, and I only wish I could see good ground for dissenting from their views. There will be a rude awakening for the dwellers in the fools' paradise of the land taxers should the proposals of the Government become law, for the first result will be an immediate calling in of mortgages all over the country, and this in itself will make for anything but the boom that Messrs. Moore and Crabtree so joyfully anticipate.

Alfred C. Houston, A.R.I.B.A.

London.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructural, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Building Line Question.

Essex.—H. J. K. writes: "Where a building line is described as 8ft. from the road, and no other information is given as to the building line, when depth is very limited, which of the following may project in front of that line, and which may not?:—(1) Eaves verges and the like, (2) a timber bay to one floor only, carried on wood brackets or stone corbel, (3) a timber bay to ground floor only, on a brick retaining wall, (4) a timber bay on brick retaining wall carried up both floors to same height as building, (5) a brick or stone bay to ground floor only, (6) ditto to first floor (full height of building), (7) a brick porch."

It is very unusual for so bare a description to be given of any building line, and I should imagine that if you consult your conveyance or the original sale particulars of your property, you will find a clearer statement of the facts. However, taking your question as it stands, I should say that it is certain that numbers (2), (3), (4), (5), (6), and (7) must all be kept within the building line. I should not myself consider number (1) as an infringement of the building restriction. F.S.I.

Use of Terms Fir and Deal.

Portsmouth.—Student writes: "Upon what system are the terms Fir and Deal used in specifying and quantity surveying in a London office? Here are a few extracts from Leaning's Quantities:—Fir framed-in roofs; 2in. deal in firrings; 2½in. × ¾in. deal battens; fir wrought cleats; deal wrought fence; fir proper door frames; sashes and frames in deal; framings in deal; fir framed and wrought all round. Without doubt the first two would be same quality material, and you will see that in another case a frame when mentioned with the sash is deal, but by itself is referred to as fir. Would the fence be of same quality if described 'fir wrought fence?'"

The terms, "fir" and "deal" have various significations. Among quantity surveyors, fir is generally used to express any pine or fir wood used in the rough—that is, with sawn faces only—while deal is used to express the same material when wrought; for example, "fir rough carriages," "deal wrought shelves," with the exception that scantling stuff, like beams or roof timbers, if wrought, has the labour measured separately, and described as "wrought face or fir." Perhaps the distinction arises from material cut out of boards taking the name deal, and that cut out of quartering or larger stuff taking the name fir. Then, again, "deal" is the term used for boards 3in. thick and 9in. wide, as distinguished from "planks," which are 11in. wide; or "battens," which are 7in.; or narrow battens," which are 4in. or 4½in. wide, whatever may be the thickness. The examples given by querist show the varied use of the terms that one may meet with, and the above notes give the nearest explanation that one can arrive at, and it is really of little consequence whether any particular item is described as deal or fir.

HENRY ADAMS.

Columbia Fir.

BRADFORD.—H. F. writes: "I should be obliged if any of your readers would be good enough to state the disadvantages (if any) of Columbia fir as compared with best quality Baltic or Archangel red wood for joiners' work."

The writer has no knowledge of "Columbia fir." There are various woods shipped at Quebec and other Canadian ports that may come from British Columbia, including the *Pinus rubra* or red pine, *Pinus strobus* or white pine, *picea alba* and *P. nigra* or white and black spruce. The red pine is a clean, sound timber, with distinct annual rings and a reddish colour, very like pitch pine, the best being stamped M or I on the end of the log; the white pine is the patternmakers' wood, and only suitable in joinery for panels; the spruce fir is close and straight-grained, but not strong and with small hard knots; sap wood and heart-wood are alike in appearance.

HENRY ADAMS.

Books on Factory and Workshop Construction.

WALMER.—W. G. W. writes: "I shall esteem it a favour if you will kindly recommend a book dealing with the planning and construction generally of modern workshops, factories, etc."

The following books on the subject can be obtained from Mr. B. T. Batsford, 94, High Holborn, W.C.:—"The Design of Steel Mill Buildings, and the Calculation of Stresses in Framed Structures," by M. S. Ketchum, C.E. With 200 illustrations; large 8vo., 16s. net. Although dealing chiefly with mill buildings, much of the matter will apply equally well to all classes of steel-frame construction. "The Design of Walls, Bins and Grain Elevators," by M. S. Ketchum, C.E., with 238 illustrations; large 8vo., 16s. net. This work presents a systematic analysis of the stresses due to granular materials, together with a discussion of the principles of design, and the details of structures which contain such materials. "Modern Machine Shops, their Construction, Equipment and Management," by O. E. Perrigo. With 200 illustrations of plans, details of construction and fittings, etc.; 4to, 21s. net. The following works might also be of service as indicating requirements: "Factory Organisation," by Henry Spencer, which deals with the commercial organisation of engineering factories. With 92 illustrations, 221 pages, 8vo, cloth, 10s. 6d. net. "Management of Small Engineering Workshops," by A. H. Barker, price 7s. 6d. net.

Use of Party Wall.

PLYMOUTH.—PARTY WALLS writes: "An old terrace house has been pulled down preparatory to rebuilding. The old purlins and floor trimmers took bearings on divisional walls, and walls were plugged to receive plastering battens for the house that has been demolished. Would these facts imply a right to re-use the divisional wall in a similar way, and to cut and pin new chimney breasts and cross walls to same, and also to raise up the divisional walls for the proposed new premises?"

It is impossible to give an opinion upon a party wall question such as this without a personal inspection. The wall may be a party wall or it may belong wholly to one side or the other. The support for timbers having existed over twenty years, an easement for them may have been acquired, even if the wall belong wholly to the adjoining owner; but how far this will enable new work to be attached to the wall is a legal question which the writer cannot determine.

HENRY ADAMS.

Stamping Agreements.

PLYMOUTH.—BUNGALOW writes: "What value stamp is necessary to make binding an offer to take and become tenant of a villa?"

A sixpenny stamp is often put upon a letter embodying the terms of a contract; and this can be done in your case by taking it to the local post-office. I should, however, strongly recommend you to have a simply worded agreement drawn up for a tenancy of this description, even if it goes no further than to name the rent, dates when payable, and notice required to terminate the tenancy; this document will need a stamp according to the following scale:—If the rent be under £5 per annum, 6d.; under £10, 1s.; under £15, 1s. 6d.; under £20, 2s.; under £25, 2s. 6d.; under £50, 5s.; under £75, 7s. 6d.; under £100, 10s.; and for every £50 more rental, an additional stamp of 5s. is required. These stamps must be impressed by the Inland Revenue authorities within fourteen days of the date of the agreement.

F.S.I.

Drainage of Slaughter-houses.

SUSSEX.—B. writes: "Plans have been deposited with a local authority for two joint slaughter houses and stables under one roof, with fastening-pens adjoining, all constructed of 9in. brickwork and impervious floors. The district is undrained, and a system of drainage to cesspools and soak-aways arranged. There are no houses within 100ft. The slaughter houses are quite separate, with good through ventilation. Can the authority object because there is no drainage? or on what grounds do they refuse to pass the plans?"

The "Public Health Acts" contain very strong provisions as to slaughter-houses, and they must all be licensed by the local sanitary authorities; this provision making it competent for that authority (acting under the advice of their medical officer of health) to insist on very stringent conditions indeed if they so choose. In the case you cite, I should certainly say that the weak point is the "soak-away" part of the scheme, and I should imagine that no local authority would be justified in allowing slaughter-houses to be built unless there were (1) efficient means of flushing them down, (2) a proper cesspool to receive the washings, and (3) adequate apparatus for emptying it.

F.S.I.

Medicated, Electric, and Turkish Baths.

BRADFORD.—BATHER writes: "Kindly tell me where the most up-to-date medicated electric and Turkish baths are to be seen in the country. Also, what different baths are usually put in in the medicated and electric departments."

Good examples of Turkish baths are to be found in London and many provincial cities. Of those in the metropolis, the Turkish baths in Northumberland Avenue are well planned and constructed, and more recent examples are to be seen in two well-equipped Turkish bath establishments in Jermyn Street. Several of the recently erected fashionable hotels in London have Turkish and other baths attached. Many of the larger of the various hydropathic establishments throughout the United Kingdom contain (in addition to Turkish and Russian baths) a number of small rooms fitted with the necessary appliances for wave, sitz, needle, and douche baths, and others are arranged for the inhalation of pine vapour or for a course of electric and medicated baths such as pine-extract, sulphur, iodine, etc. Local directories should be consulted for addresses.

Measuring Masonry and Brickwork.

MANCHESTER.—ARCH writes: "In measuring the piece of masonry shown in the accompanying sketch [not reproduced], how would the sunk circular face be taken? In measuring a brick arch, built of the same kind of brick as the wall, cut by the bricklayer to radius, should it be taken as extra labour only, measured face and soffit?"

The piece of masonry sketched being part of a moulded arch will have radial joints, so that the part marked with the widths of 10ins., 8ins., and 4ins., will be measured as "sunk work in beds and joints," not as sunk circular face. The girth of a moulding is taken the full zig-zag measurement as shown by the red line in the querist's sketch. A brick arch built of the same bricks as the wall is measured in first with the ordinary brickwork, and then as "extra only to arches (described) labour and waste," measuring face and soffit and billing per foot super.

HENRY ADAMS.

Cracks in Building.

KENT.—H. P. writes: "What is the remedy for cracks that have appeared in new roughcast on an old building?"

The mortar in the walls has probably perished through damp, and before the roughcast was put on the walls should have been allowed to dry as much as possible; that is, the roughcast should have been put on towards the end of the dry season, merely moistening the face sufficiently to secure adhesion. The interior should then have been left bare for at least twelve months, to let the moisture further evaporate before the inside plastering was put on. The cracks in the roughcast should be pointed up or filled with neat cement grout, but the cracks at the sides of the openings indicate a general instability which can only be remedied by ¾in. tie rods right through the building with screwed ends, nuts, and washer plates on the outside. These should be at right angles to each other, and just under the floors would probably be the most convenient place for them.

HENRY ADAMS.

Protecting Underside of Floor Exposed to Steam.

LONDON, W.C.—S. T. N. writes: "It is proposed to add a storey over a steam boiling and dyeing shop, the new floor to be composed of steel joists and wooden joists covered with 1¼in. grooved and tongued flooring. The underside of the new floor will always be exposed to the action of large quantities of steam constantly arising from the open boiling and dyeing pans. How can the new steel and wood joists be protected from damage by steam? Would fibrous plaster slabs 1in. thick screwed to the underside of joists, and finished with one coat of 'Sirapite' plaster, be effective? Would 'Bitumastic' solution protect the steelwork sufficiently without any casing? Expensive methods are out of question."

The thickness of the slabs need not be great, as it is moisture rather than heat that requires to be excluded. "Uralite" sheets painted over would be light, and probably more effective than fibrous plaster, as a lining to the underside of the wood joists. "Bitumastic" solution, or "Siderosthen," or other modern iron coating, would no doubt afford fair protection to the steel joists, but it would be better to case them in to save the condensation that would be caused during changes of temperature.

HENRY ADAMS.

A bronze plaque to the memory of the Belgian architect M. Paul Hankar (1859-1901) has been affixed to his house, 71, Rue Desacqz, Brussels, and the committee appointed to deal with the funds (amounting to 4,500 francs) that have been publicly subscribed with the object of establishing a memorial to M. Hankar, have decided to devote the balance of the money to founding a triennial prize for competition among architects who are either past or present students of the Académie Royal des Beaux Arts, Brussels.

QUANTITY SURVEYORS' ASSOCIATION.

Annual Dinner.

Nearly a hundred and fifty gentlemen sat down at the annual dinner of the Quantity Surveyors' Association held at the Criterion Restaurant on Wednesday evening, May 5th. The chair was occupied by Mr. Arnold E. Harris, J.P., F.S.I., this year's president of the Association.

The Chairman having proposed the toast of "The King,"

Mr. H. H. Bartlett gave the toast of "The Quantity Surveyors' Association." One of the objects of the Association, he said, was to have its members made responsible for the quantities; he thought that was a great thing, but it was a particularly great thing to the builder, while it must be a great thing to the architect as well as to the employer, because he must know that the articles were there and perfectly accurate.

The President, replying to the toast, said that it seemed to him, with regard to the surveyors' profession, that it was attended with some difficulties; it did not do much to foster science; it did not do much for literature. On that last subject of literature he was afraid that however well drawn up a bill of quantities might be, it could hardly be termed literature. There was one word, however, they were very fond of using, and that was the word "ditto," which hardly, however, commended them to literature. Without that term every surveyor, and he thought every builder, would look upon a set of quantities as a delusion and a snare. Their labour was shorn of the encouragement which the labour of the architect and the builder had, and was the encouragement which came from the consciousness that the work done would be a beauty and a joy for ever. But what were they? (the quantity surveyors). To put it concisely, they might consider that they were just oil, oiling the machinery which the architect and the builder worked out. But although they might be only temporary expedients, he (the speaker) thought they were of some use, practical use—to the three parties concerned in the bill—the owner, the architect, and the builder. By their efforts the owner was assured that he was only paying for value which he had obtained; the architect they hoped they were chiefly helpful to. It was said that two heads were better than one, and probably when they brought their critical faculties to bear on the drawings and specifications of the architect, they might be able to draw attention to the wants of even the best set of drawings. As to the builder, it must save him a world of trouble and anxiety to have set before him quantities free from ambiguity and free from all sporting ideals. Of course, the quantity surveyor was not recognised by all building owners, but it was being recognised by public bodies—many of whom were taking up the position of appointing their own quantity surveyors—that the quantity surveyor was necessary. Whether or not this increased recognition by public bodies was accompanied by increased remuneration he was not prepared to discuss. On that point he thought he might be allowed to enter a protest against a custom which prevailed in some cases, of inviting competitive quotations for quantities. It was not to the public interest that work of such an important character should be, as it were, put up to auction. The inevitable result must be that the work would get into the hands of incompetent men, and the public would suffer thereby. Of course they were bound to admit that in an ideal state of society—which he was afraid was far distant—they would not be wanted. At present, at any rate, they had important duties to discharge—important to all concerned with building. That Association had set out with the very laudable object of seeing that these duties were properly and adequately discharged; they should be discharged with skill, with science, with accuracy, and with discretion. Any profession which set before itself these principles was bound to endure and prosper. That gathering showed that however young their Association was it was pushing forward; it was not founded in any antagonism to the Surveyors' Institute; but they felt that they should have a separate Association for quantity surveyors. Let them both flourish.

Mr. S. Chatfeild Clarke, F.S.I. (London), one of the vice-presidents of the Quantity Surveyors' Association, next proposed the toast of "The Architects." Anyone, he said, who had watched the architectural output for the last twenty-five years could not fail to be struck by the great improvement in the designs of both public and private buildings during that period. The only science that had not yet been fully mastered was that of ventilation, and he thought there was a fortune in store for the man who would invent a system of ventilation which would not stifle people or create a draught. The speaker went on to advocate hearty co-operation between architects and surveyors, while he emphasised the president's point as to the danger of advertising for tenders for quantity surveyors. In this regard Mr. Clarke asked the architects to, on every available opportunity, point out to public bodies the probable harm that lurked behind such a system.

The toast having been honoured, Mr. T. J. Bailey, F.R.I.B.A., said, in reply, that whatever might be said for or against the architecture of the day, there was one thing to be proud of, and that was that the modern buildings in this London of theirs, such as the Houses of Parliament, had been proclaimed by no less eminent a critic than the late Sir Richard Temple to be the finest in the world. They could only hope that the new County Council hall would be worthy to rank with the Houses of Parliament. Dealing with the work of the quantity surveyor, Mr. Bailey said it would be impossible for architects to arrive at proper estimates and proper arrangements were it not for the intermediation of the quantity surveyor, and he was sorry to say that that assistance was not adequately acknowledged. Continuing, the speaker humorously said that in his opinion the happiest time of an architect's life was about a fortnight after the quantity surveyor has had the drawings. He came with the inevitable query sheet; he said, "You have done this, and you have done that; what do you mean?"

The next toast on the list was that of "The Contractors." It was proposed by Mr. H. T. A. Chidgey, London, vice-president of the Quantity Surveyors' Association, who advocated closer co-operation between the three branches of the building trade.

Mr. W. F. Wallis, president of the Institute of Builders, replied. Personally, he said, if he had his choice, he would prefer to be an architect rather than a builder or quantity surveyor, for he thought that one of the greatest pleasures in life was to be able to look on a great building and think that its construction was the outcome of his own ability. Secondly, he wished to belong to the quantity surveyors; they held a kind of silent position, but on the other hand he thought they had this advantage, that they did not stand so much to be shot at as either the builder or the architect.

Mr. C. A. Kennett proposed the toast of "The Visitors," coupled with the name of Mr. A. A. Hudson.

Mr. Hudson, in replying, made reference to the recent Budget, and especially to the portion of it having reference to the question of land values. To his mind the question of land values was the most serious thing that had ever been put before the country, and most serious of all to the building trade. Let them see what was going to take place! He did not mind about taxation for the time being—that was the halfpenny in the £—but the matter they had to deal with was that when the land was transferred—whether it be developed or undeveloped—they had to part with one-fifth to the Government, which was a sort of sleeping partner, and took one-fifth of the profits while sharing none of the losses. He did not believe that any trade in the country would carry on its business on such lines. What he desired to call their attention to was this. The building trade, they must remember, was kept on foot and was fostered by those who had money; the builder or the architect could not do without the financier. What was going to be the effect of the taxation of land values? To his mind, it would be that the banker or the mortgagee would say that he wanted something better in the way of security. At the present time, with the depression in the building trade and the depression in the value of building land, many people had advanced money on mortgage when the security was very small indeed. If once they found that the security was good enough to meet the loan, and they were going to have one-fifth taken away by the sleeping partner, it would be a very different matter. He viewed this as a very serious matter. It would not stop there, but would go on affecting the different classes until at length it reached the working man. In his work as arbitrator for the Board of Trade, Mr. Hudson said, he knew of instances where the building trade was now only one-third of what it was four years ago.

The health of the hon. secretary (Mr. Cross) having been drunk, the proceedings terminated.

ARCHITECTS' CHARGES IN AMERICA.

In a circular recently issued by the American Institute of Architects, whose offices are at the Octagon, Washington, D.C. (secretary, Mr. Glenn Brown), it is observed that while the remuneration of the architect has not advanced during the past forty years, the cost of production, office expenses, and draughtsmen's salaries, have nearly doubled. Proper equipment requires a longer preparation and a more thorough education, and the responsibility of the architect has been enormously increased by the requirements of the modern structure with its engineering, mechanical, and electrical equipment. The old charge of five per cent. continued in vogue for forty years.

The profession for many years has known that it was not being adequately remunerated for its services, and for a number of years the conventions have considered the advisability and necessity of increasing the architect's fees. At the convention in Washington, December 15th to 17th, 1908, a new schedule was unanimously adopted, changing the minimum rate from five to six per cent., and making a number of minor modifications.

The following is the new schedule mentioned in the circular:—

The American Institute of Architects: Professional Practice of Architects and Schedule of Proper Minimum Charges.

1. The architect's professional services consist of the necessary conferences, the preparation of preliminary studies, working drawings, specifications, large scale and full size detail drawings, and of the general direction and supervision of the work, for which, except as hereinafter mentioned, the minimum charge, based upon the total cost* of the work complete is six per cent.

2. On residential work, on alterations to existing buildings, on monuments, furniture, decorative and cabinet work and landscape architecture, it is proper to make a higher charge than above indicated.

3. The architect is entitled to compensation for articles purchased under his direction, even though not designed by him.

4. If an operation is conducted under separate contracts, rather than under a

---

*The total cost is to be interpreted as the cost of all materials and labour necessary to complete the work plus contractors' profits and expenses, as such cost would be if all materials were new and all labour fully paid, at market prices current when the work was obtained.

general contract, it is proper to charge a special fee in addition to the charges mentioned elsewhere in this schedule.

5. Where the architect is not otherwise retained, consultation fees for professional advice are to be paid in proportion to the importance of the questions involved and services rendered.

6. Where heating, ventilating, mechanical, structural, electrical, and sanitary problems are of such a nature as to require the services of a specialist, the owner is to pay for such services. Chemical and mechanical tests and surveys, when required, are to be paid for by the owner.

7. Necessary travelling expenses are to be paid by the owner.

8. If, after a definite scheme has been approved, changes in drawings, specifications, or other documents are required by the owner; or if the architect be put to extra labour or expense by the delinquency or insolvency of a contractor, the architect shall be paid for such additional services and expense.

9. Payments to the architect are due as his work progresses in the following order: Upon completion of the preliminary studies, one-fifth of the entire fee; upon completion of specifications and general working drawings (exclusive of details), two-fifths additional, the remainder being due from time to time in proportion to the amount of service rendered. Until an actual estimate is received, charges are based upon the proposed cost of the work, and payments received are on account of the entire fee.

10. In case of the abandonment or suspension of the work, the basis of settlement is to be as follows: For preliminary studies, a fee in accordance with the character and magnitude of the work; for preliminary studies, specifications, and general working drawings (exclusive of details), three-fifths of the fee for complete services.

11. The supervision of an architect (as distinguished from the continuous personal superintendence which may be secured by the employment of a clerk-of-the-works or superintendent of construction) means such inspection by the architect or his deputy, of work in studios and shops or a building or other work in process of erection, completion, or alteration, as he finds necessary to ascertain whether it is being executed in general conformity with his drawings and specifications or directions. He has authority to reject any part of the work which does not so conform, and to order its removal and reconstruction. He has authority to act in emergencies that may arise in the course of construction, to order necessary changes, and to define the intent and meaning of the drawings and specifications. On operations where a clerk-of-the-works or superintendent of construction is required, the architect shall employ such assistance at the owner's expense.

12. Drawings and specifications, as instruments of service, are the property of the architect.

As revised at the Washington Convention, December 15th—17th, 1908.

GLENN BROWN, Secretary,
The Octagon, Washington, D.C.

The subject was commented upon in a leader which appeared on p. 428 of our issue of May 5th.

Societies' Reports.

Northampton Architectural Excursions Club.

About 30 members visited Spratton Church on May 1st. The building was erected about the end of the 12th century, and exhibits traces of many periods from late Norman to 15th century work. The Rev. R. M. Sergeantson, F.S.A., president of the club, conducted the party.

Sheffield Society of Architects and Surveyors.

At the annual general meeting held on Thursday last, the ballot for officers for the ensuing session resulted as follows:—President, Mr. W. J. Hale; vice-president, Mr. J. B. Mitchell Withers; treasurer, Mr. F. Fowler; hon. secretary, Mr. J. R. Wigfull; council, Messrs. H. Coverdale, C. B. Flockton, H. L. Paterson, A. E. Turnell, A. F. Watson, E. Winder, W. G. Buck, C. F. Innocent, and H. I. Potter. The past presidents are also members of the council.

Institution of Municipal Engineers.

At a meeting of the members resident in the home counties district (northern division), which includes Bedford, Buckingham, Essex, Herts., and Middlesex, held during the Building Exhibition, Mr. Henry C. Adams, A.M.I.C.E., A.M.I.M.E., A.M.I.E.E., consulting engineer, of 60, Queen Victoria Street, E.C., was elected chairman of the district committee and a member of the Council of the Institution. Mr. Bernard Partridge, surveyor's office, Walthamstow U.D.C., was elected honorary secretary, and an executive sub-committee was appointed.

Birmingham Clerks of Works and Builders' Foremen's Association.

At the Midland Institute on Wednesday, May 5, Mr. Wm. Henman, F.R.I.B.A. (of Messrs. Henman and Cooper), delivered to the members of the above Association a lecture on "The principles involved in reinforced concrete structures." The lecture was illustrated by models and sketches, Mr. Henman being the inventor of several systems of reinforcement which are largely used in the construction of beams, lintels, and floors.

Mr. Henman pointed out that there were still some persons who seemed to think that concrete would stand any weight, or any amount of heat, and that it might be made of any rubbish in any slipshod manner. But it was becoming increasingly necessary to study the subject scientifically.

The strength of concrete depends greatly upon the cleanliness of the aggregates as well as upon proper grading and careful mixing with the best qualities only of cement, with perfectly clean water; the mixture being allowed to set slowly, and kept damp and cool during the process. After pointing out how easily concrete could be spoiled by neglect of these precautions, the lecturer expressed his confidence in the future of reinforced concrete building.

Edinburgh Architectural Association.

The Edinburgh Architectural Association have paid a Saturday afternoon visit to Kirkcaldy. On arrival at the station, a special tram-car conveyed the party to Ravenscraig Castle. Mr. John Watson, F.R.I.B.A., who acted as leader, explained that the castle had been founded by James II. shortly before his death in 1460. On leaving the castle, the party walked through the grounds to the ruins of St. Serf's Church, Dysart, dedicated in 1245. Sir Michael B. Nairn, Bart., who accompanied the party, received a vote of thanks, on the motion of Mr. E. C. H. Maidman, architect, for his kind permission to visit the buildings. The afternoon's outing was concluded with a visit to several houses of the 16th and 17th centuries in the town of Dysart.

Liverpool Architectural Society.

The annual report of the Council of the Liverpool Architectural Society for the official year 1908-9, being the sixty-first session, shows that the membership consists of fifty-four Fellows and seventy-seven Associates, as compared with fifty-six Fellows and sixty-nine Associates at the close of the immediately preceding session. There are three Hon. Fellows (an increase of one), nine Hon. Associates, and twenty-eight Students (an increase of five).

The Council regret to record the death (as recorded in this journal at the time), which occurred on January 31st last, at his residence, Broughton, Chester, of Mr. Edward Augustus Lyle Ould, F.R.I.B.A., who had been a member of the Society since 1886, and president in 1899 and 1900.

It is recorded that during the year the Council have been approached by the Manchester Society of Architects with a view to concerted action between the two societies with respect to architectural competitions. The Council, recognising the value of the work upon which the Manchester Society has been engaged, and with a view to benefiting by the greater influence to be obtained by co-operation, have appointed a competitions committee to take action in the cases of competitions, more especially those belonging to the county of Lancaster, in which, in the judgment of the committee the general conditions may appear to be unsatisfactory. In conjunction with the Manchester Society, a definite form of conditions of competition has been drafted. It is hoped by this united action to bring about the general adoption of an equitable and carefully worded form of conditions, "free from objectionable clauses such as are frequently inserted, often through ignorance on the part of the promoters."

The President (Mr. T. E. Eccles, F.R.I.B.A.) has been a frequent attendant at the council meetings of the Royal Institute of British Architects, and his experience suggests that some new method of representation is desirable in order that the architectural thought of the country may be presented with due weight when matters of general professional interest have to be dealt with.

The Council have been approached by certain master builders' associations with the request that whenever possible members of the Society should cause to be included in their bills of quantities a sum of money to cover the cost of attendance upon specialists, there being no means of fairly estimating the value of the attendance which may be required. The Council is of opinion that the request is a fair and reasonable one, and recommend its adoption by the members of the Society.

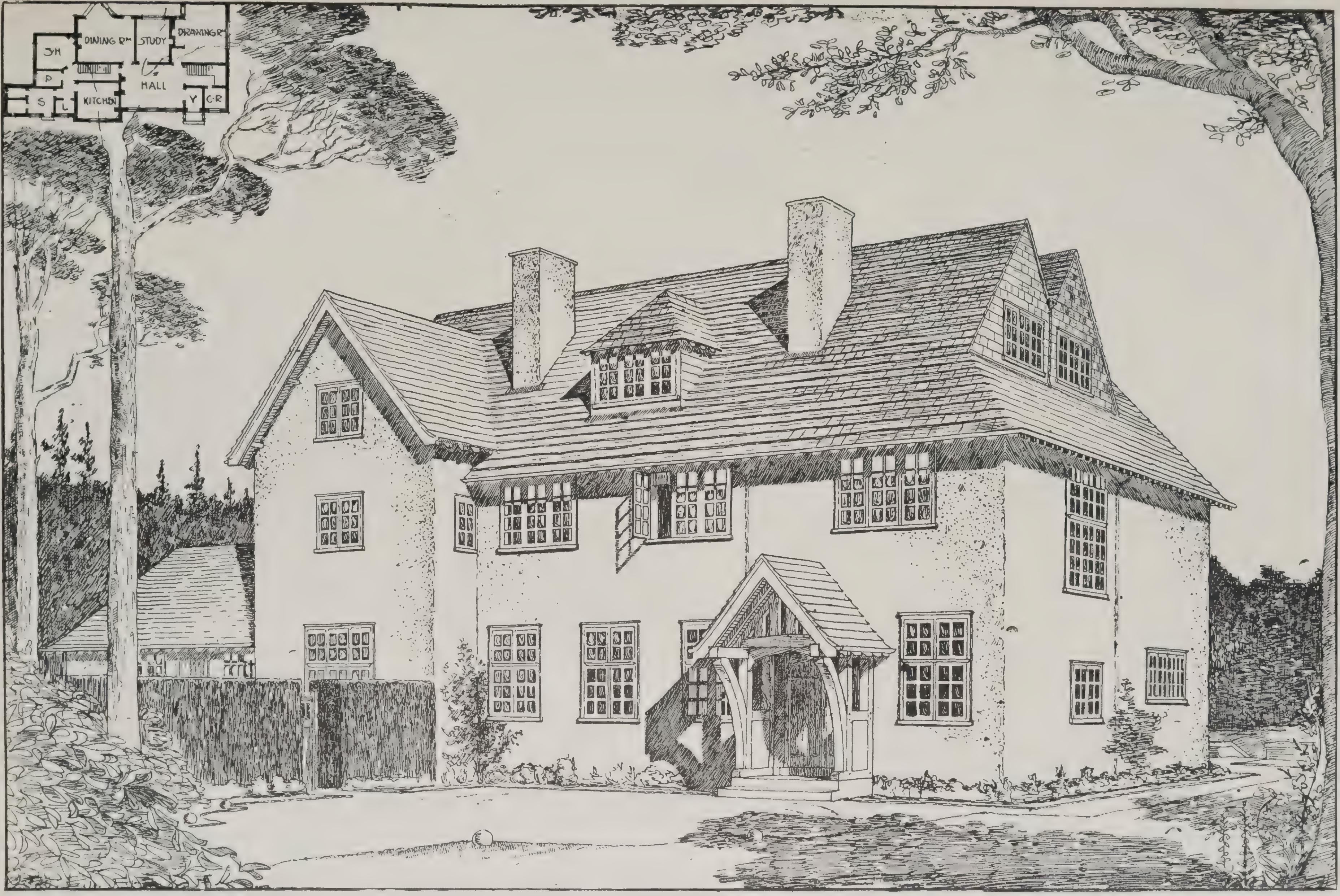
The Liverpool School of Architecture has been recently visited by the president of the Royal Institute of Architects of Ireland, who was seeking information with a view to the establishment of greater educational facilities in Dublin. It is remarked that interest in the work of the School has been enhanced by the generosity of Mr. W. H. Lever, M.P., in contributing £1,000 per annum for three years for the promotion of the study of town planning, and a capital sum of £500 for the promotion of research, and the consequent creation of the new Chair of Civic Design and Landscape Architecture, and the appointment of Mr. Stanley Davenport Adshead, F.R.I.B.A., as Associate Professor. Liverpool is thus becoming an important centre of architectural thought.

Gloucestershire Architectural Association.

A monthly meeting of the Gloucestershire Architectural Association was held at the Northgate Mansions, Gloucester, the President (Mr. H. W. Chatters) being in the chair. Others present included Messrs. W. B. Wood, M. H. Medland, F. W. Waller, G. P. Milnes, T. Malvern, H. A. Dancey, J. F. Trew, J. G. Crisp, E. A. Pryer, E. J. Dolman, H. Gardner, H. S. Davis, N. H. Waller, D. R. Lyne, and T. Overbury (hon. secretary). An address was given by the President on "The Architectural Outlook," in which many points of great importance to the profession were considered in detail. The long and continued unemployment in the building trades, trades unions, "builder-architects," the compulsory registration of architects, pupilage, architectural education, and many legal points were dealt with by Mr. Chatters, and gave rise to an animated discussion, in which most of the members joined. At the conclusion a hearty vote of thanks was accorded to the President for his address.

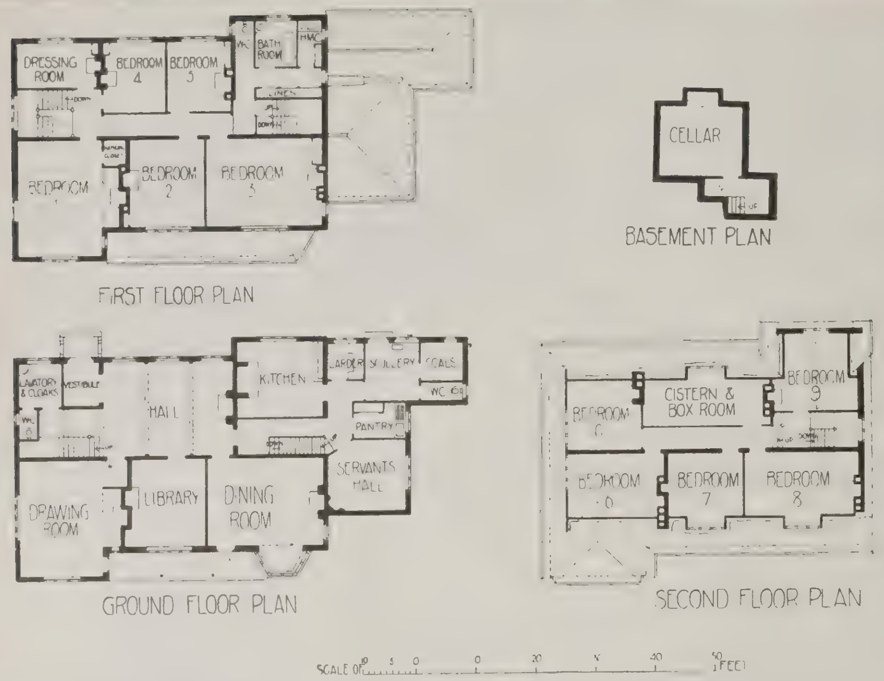
Surveyors' Institution.

At the Surveyors' Institution, Mr. A. B. Howes, barrister-at-law, in a paper on "Quantity Surveyors: a review of their legal position," quoted Mr. Justice Morris's definition of a quantity surveyor as "a person whose business consists in taking out in detail the measurements and quantities from plans prepared by an architect for the purpose of enabling builders to calculate the amounts for which they would execute the



HOUSE AT BINTON PARK, FARNHAM, SURREY. ARTHUR J. STEDMAN. ARCHITECT.

This house is situate on a site adjoining and overlooking the Farnham Golf Links, and the surrounding extensive views, in a district where pine trees are abundant. The walls are finished externally with white rough-cast, and the roof covered with Tilberthwaite green slates; the joinery work is painted a dark green. An ingle nook is formed in the drawing-room and bedroom above. The hall is spacious, with arched ribs and storey posts, the ceiling being formed between the joists. The joinery generally is of a very plain character, with fastenings and fittings of hand-made wrought ironwork. The building was erected by Messrs. Tompsett and Co., of Farnham. For plans see next page.



HOUSE AT BINTON PARK, FARNHAM, SURREY. ARTHUR J. STEDMAN, ARCHITECT.

plans." Mr. Howes summarized the relationship between the different parties to a building contract as follows:—(1) As between owner and quantity surveyor, there is a contract of service, either direct or through the agency of the architect, and there seems to be a warranty not of absolute, but of reasonable accuracy. When an architect has been instructed to obtain tenders entitling the architect to employ a surveyor, and no tender is accepted, the building owner is liable to the surveyor for the price of the work done under the implied authority of the owner to the architect; but if the owner has accepted a tender with a builder in good faith for the execution of the work, the owner has discharged his duty to the quantity surveyor and is not liable for his charges. (2) As between builder and building owner, as a general rule there is no warranty of the accuracy of the bills of quantities, but when the quantities form part of the contract, anything necessary to carry out the work, but not included in the quantities, will be an extra. (3) As between quantity surveyor and builder, there is no liability for negligence in preparing quantities, since there is no privity of contract between the parties; but where there is fraud or misrepresentation the surveyor is liable. Unless the builder checks the quantities, he must take the risk of mistakes in them. When once a builder's tender is accepted, and he has received payment from the building owner, part of which is for the purpose of paying the surveyor, the builder is liable to pay the surveyor. (4) As between builder and architect, the latter has no liability as to quantities unless some contract exists between him and the builder in reference to their accuracy. (5) As between quantity surveyor and architect, there is no liability, since the architect employs the surveyor as the agent of the building owner and not on his own account.

Northern Architectural Association.

The report of the Council for the fiftieth session of this Association shows that the members at the end of 1908 numbered 84, the associates 86, and the students 83; total 253, as compared with a total of 248 for the year immediately preceding. An interesting sketch of the history of the Association, which was founded in 1858, was given by Mr. G. T. Brown, F.R.I.B.A., the president, in his address at the commemoration of the fiftieth anniversary of the Association. Of the twenty-seven founders, four are living. A gift of £1,000 by Mr. Glover enabled the Association to acquire its own premises at 6, Higham Place, Newcastle-on-Tyne; and the same gentleman gave a further sum of £500 for the educational work of the Association. The hon. secretary is Mr. C. S. Errington, A.R.I.B.A.

Devon and Exeter Architectural Society.

A "Journal of Proceedings" of this society, which was instituted in 1887, and has Exeter for its centre, and Devonshire and Cornwall for its province, and is, of course, in alliance with the R.I.B.A., includes a list of office-bearers and council for 1909, the council's annual report, and summaries of the papers read before the society during 1908, an account of its proceedings during the year, lists of members (48), associate members (13), etc., and a catalogue of the society's library. The papers read include "Some Modern Applications of the Orders," by Mr. C. J. Tait, F.R.I.B.A., of Exeter; "Some Peculiarities in the Construction of Hollow Walls," by Mr. T. A. Andrews; and "Hospital Planning and Construction," by Mr. J. C. Southcombe, of Barnstaple. The president for 1909 is Mr. W. H. May, M.S.A., of Plymouth; vice-president, Mr. C. Cole, M.S.A., of Exeter; hon. secretary, Mr. Allan J. Pinn, A.R.I.B.A., 5, Bedford Circus, Exeter.

Coming Events.

Thursday, May 20.

JUNIOR INSTITUTION OF ENGINEERS, ROYAL UNITED SERVICE INSTITUTION, WHITEHALL.—Mr. C. A. Smith, B.Sc., on "Ductile Materials under Stress," 7.30 p.m.

Saturday, May 22.

ROYAL INSTITUTE OF BRITISH ARCHITECTS, 9, Conduit Street, London, W.—Last day for Applications for Final and Special Examinations. Address Secretary.

Thursday, June 24

ROYAL INSTITUTE OF BRITISH ARCHITECTS, 9, Conduit Street, London, W.—Final and Special Examinations begin. (Applications must be sent in by May 22.)

Insurance.

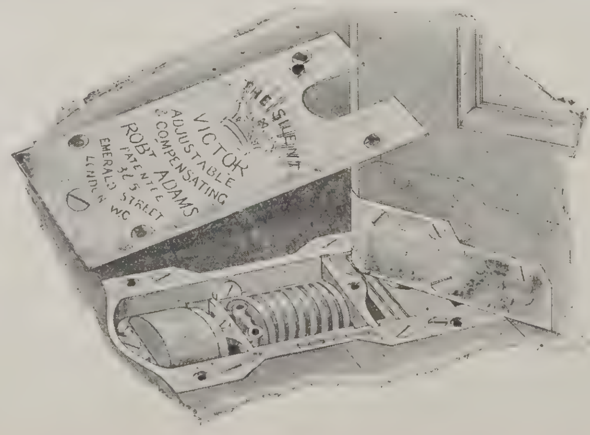
Subscribers to "The Builders' Journal" are entitled to a Free Insurance for £500. Every subscriber should apply for this, sending a postcard with the name of the newsagent with whom the order has been placed. Subscribers can also obtain a General Accident and Sickness Insurance (the "Lighthouse" policy) at a reduced premium, which includes the Annual Subscription to this Journal. A pamphlet giving full particulars can be obtained free on application.

Free £500 Accident Insurance Coupons have been sent to the following:

R.C.W. (Ipswich); G.L.T. (Much Hadam); W.R.S. (Batley); E.B. (Shipley); T.E.D. (Birmingham); W.T. (Nottingham); R.K.D. (Putney); F.T. (Liverpool); R.S.B. (East Dulwich); E.G. (Darlaston); C.McD. (Birkenhead); A.W.W. (Portsmouth); R.J.S. (South Norwood); S.H. (Chatteris); G.O.S. (London, W.); R.J.J. (Portsmouth); P.C. (Turriff); W.K.B. (Eccles); E.M.L. (Devonport); A.T.M. (Dover); W.B.W. (Cambridge); W.R. (Fishguard); H.K.C. (Ramsey); A.F. (Harrow); D.H. (Scalby); E.E.P. (Harverstock Hill).

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.

PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE,
with silent check action—showing its unequalled opening capacity.

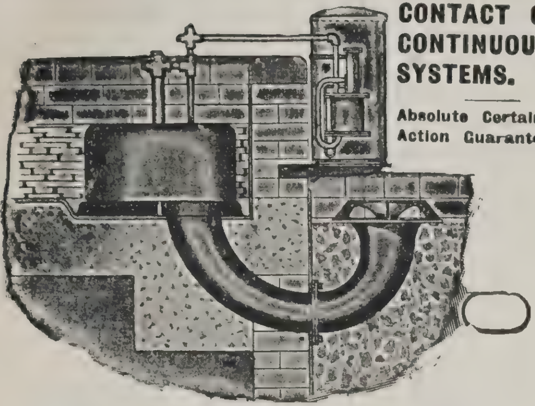
SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.

60 HIGHEST AWARDS.

The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing.

— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

BACTERIAL TREATMENT OF SEWAGE.



CONTACT OR CONTINUOUS SYSTEMS.
Absolute Certainty. Action Guaranteed.

PATENT ALTERNATING SYPHONS.
PATENT TIMING SYPHONS
(requiring no auxiliary brick chambers).
PATENT ROTARY DISTRIBUTORS
FOR TRICKLING FILTERS.
PATENT SEWER FLUSHING SYPHONS.

BURN BROTHERS,
Sanitary Engineers,
3, Blackfriars Rd., LONDON, S.E.
ALSO AT EDINBURGH.

CARRON
BATHS & LAVATORIES

GRAND PRIX
Franco-British Exhibition.

Will insure not only more comfort and convenience to your tenant, but increased value to your property. They are universally acknowledged as the standard for finish and efficiency and are constructed on sound sanitary principles.

Carron enamelling will not crack or chip, and can be had in various colours.

WRITE FOR No 8 BATH CATALOGUE
CARRON COMPANY
INCORPORATED BY ROYAL CHARTER 1773
CARRON, STIRLINGSHIRE.

THE HATHERN STATION BRICK & TERRA COTTA COMPANY, Ltd.,

Supplied the Terra Cotta for this Building.

WORKS & OFFICES:
Hathern Station
Loughborough.

Blue Brick Makers

CLIFF WORKS,
TAMWORTH,
STAFFORDSHIRE.

(See our fortnightly picture of building.)

Co-operative Insurance Co.'s Offices, Manchester.

Publisher's Notices.

Offices: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address: "Buildable, London."

Telephones: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are a follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER, S.W.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Abergavenny.—For the reconstruction of the upper floors with fireproof staircases, new bath houses, etc., at the Monmouthshire Asylum, Abergavenny. Mr. E. A. Johnson, F.R.I.B.A., architect:—

	£	s.	d.
W. J. Bloxham, Banbury ...	£16,500	0	0
H. Smith, Kidderminster ...	15,728	0	0
J. Long and Co., Ltd., Bath...	15,490	0	0
J. Jenkins, Ltd., Newport ...	15,125	0	0
W. Williams, Cardiff	14,990	0	0
J. G. Thomas and Sons, Abergavenny	14,482	0	0
Hayward and Wooster, Bath	13,969	0	0
T. Broad, Ltd.,* Great Malvern	13,739	0	0
A. J. Colborne, Swindon ...	13,599	14	0

*Accepted

Addlestone, Surrey).—For repairs to buildings of the Princess Mary Village Homes, for the Committee. Messrs. Thurgood, Son and Chidgey, architects, 8, Adelphi Terrace, W.C.:—

	£	s.	d.
Parrott and Isom	£2,166	0	0
Grover and Son	2,052	0	0
Tompsett and Co.	1,470	0	0
W. H. Gaze and Sons ...	1,464	0	0
Caesar Bros.	1,300	0	0
R. Love	1,331	0	0
W. Greenfield	1,299	18	0
E. Potterton	1,290	0	0
Drowley and Co.	1,210	0	0
Deacon and Son,* Addlestone...	958	0	0

*Accepted.

Birmingham.—Accepted for new premises for Messrs. F. Keay and Co., Ltd., Church Street. Mr. George A. Cox, architect, 33, Newhall Street, Birmingham:—

G. Webb and Son, Birmingham, £3,479.

Birmingham.—For alterations and additions to Messrs. Zimmerman's premises, Regent Place. Messrs. Parrott and Antrobus, architects, Colmore Row, Birmingham:—

G. Webb and Son, Birmingham, £1,345 (revised and accepted).

Barnstaple.—For the erection of a new secondary school for 304 children, including laboratories and lecture room, manual training and cookery rooms, cycle sheds, covered playgrounds, tar-paved playgrounds, new approach roads, gates, paths, boundary fences and formation of tennis courts, for the Devon County Education Authority. Mr. Percy Morris, county architect (Education), 1, Richmond Road, Exeter. Quantities by Mr. S. W. Haughton, 22, Courtenay Street, Plymouth:—

		Alternative No. 1. Deduct.	Alternative No. 2. Add.
Baker Bros., Exeter—	£11,257 6 5	£118 1 0	£159 4 8
Pearn Bros., Plymouth—	11,227 0 0	99 0 0	141 0 0
R. Pickett, Ilfracombe—	10,990 18 5	89 9 2	30 9 4
R. F. Yeo and Sons, Torquay—	10,986 10 4	20 3 8	246 11 0
D. Davis and Sons, Cardiff—	10,875 0 0	102 8 6	200 0 0
J. Bryant and Sons, Barnstaple—	10,856 6 3	113 9 6	163 10 0
Johnson and Co., Plymouth—	10,647 4 7	112 8 7	157 2 4
D. W. Davies, Cardiff—	10,435 0 0	95 0 0	169 0 0
R. Wilkins and Sons, Bristol—	10,397 11 6	59 10 8	170 16 10
H. Sillifant, Barnstaple—	10,239 6 0	85 18 10	144 4 5
Woolaway and Sons, Barnstaple—	10,175 17 0	80 18 0	159 12 3
A. N. Coles, Plymouth—	10,050 3 0	133 17 4	201 13 6
Westcott, Austin and White, Exeter—	9,930 0 0	62 7 11	183 19 4
F. J. Badcock, Ashburton—	9,887 1 4	103 17 11	119 12 1
W. E. Bennett, Bodmin—	9,880 16 2	108 14 6	112 3 3
F. J. Stanbury, Plymouth—	9,861 12 9	139 1 3	122 1 10
E. P. Bovey and Sons, Torquay—	9,790 14 10	78 14 5	122 17 9
Wakeham Bros., Plymouth—	9,728 0 0	97 0 0	124 0 0
C. Bryer, Bridgwater—	9,714 0 5	100 4 0	137 8 0
N. Pratt, Clyst St. Mary—	9,659 10 0	108 5 3	202 17 6
Pethick Bros., Plymouth—	9,636 0 0	88 0 0	154 0 0
A. Darch, Umberleigh—	9,320 2 6½	73 0 0	138 0 0
G. Pollard and Co., Ltd.,* Taunton—	9,273 2 6	89 6 9	145 5 2

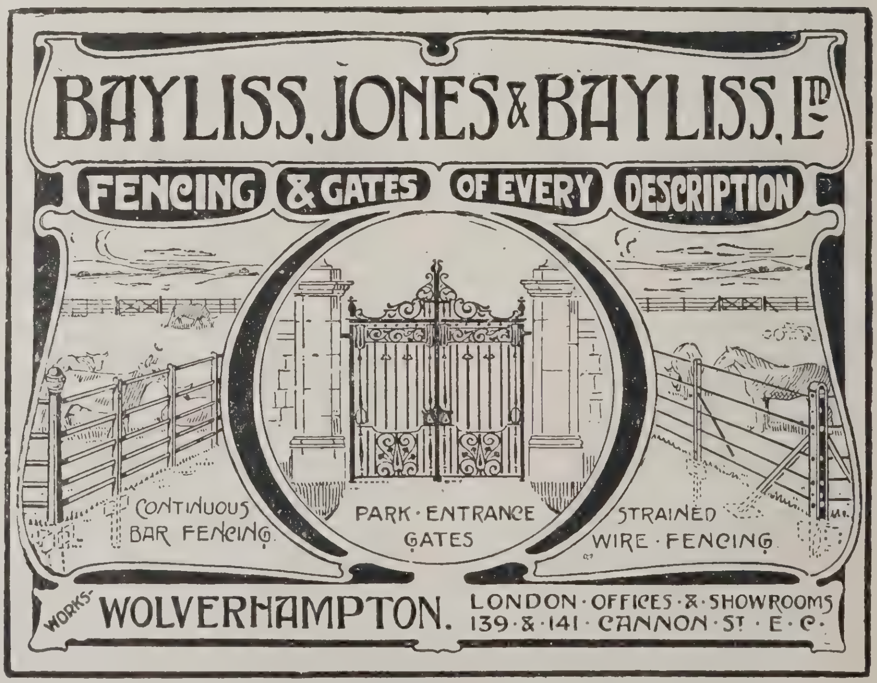
*Accepted.

(*Tenders continued on page viii.*)

ROOFING SLATES.
Velinheli, Penrhyn and Westmoreland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

All that is Best
IN
Accident and Illness Insurance
of every description can be obtained at prices to suit all pockets on application to
The Ocean Accident and Guarantee Corporation, Ltd.
BRANCH OFFICE: 233, STRAND, W.C.
Fire, Burglary and Motor Car Insurance

"AQUABAR"
WATERPROOFING COMPOUND
For Cement and Concrete.
Easiest to use, most economical, reliable and satisfactory.
C. S. TAPLIN & Co.,
MOORGATE STATION CHAMBERS,
LONDON, E.C.


BAYLISS, JONES & BAYLISS, Ltd.
FENCING & GATES OF EVERY DESCRIPTION
CONTINUOUS BAR FENCING
PARK · ENTRANCE GATES
STRAINED WIRE · FENCING
WORKS WOLVERHAMPTON.
LONDON · OFFICES · & · SHOWROOMS 139 · & · 141 · CANNON · St. · E · C ·

FOLDING PARTITIONS. REVOLVING SHUTTERS.
Hartley Bros.,
2/- ft. Super.
1/- ft. Super.
GORTON, MANCHESTER.

J. G. HAMMOND & CO., LTD.
PRINTING CONTRACTORS.
LONDON WORKS: 32 to 36, Fleet Lane, Ludgate Circus, E.C.
MIDLAND WORKS: Scotland Passage, High Street, and Moor Street, Birmingham.

SPECIALITY:
CATALOGUES of all kinds,
PUBLICATIONS of all kinds,
BOOKS of all kinds.

LARGE INSTALLATION OF LINOTYPE AND MONOTYPE COMPOSING MACHINERY. ENGLISH, AMERICAN AND FAST ROTARY PRINTING AND FOLDING MACHINERY.

☞ IMITATION TYPEWRITTEN CIRCULARS supplied with names and addresses typed in separately to match the body or alternatively so printed as to enable you to type in the names and addresses on your own typewriter.

SEND FOR ESTIMATES AND UNIQUE TESTIMONIALS.

HOSPITALS, INFIRMARIES, SCHOOLS, &c., REQUIRE
MANCHESTER STOVES, GRATES, & VENTILATORS.
E. H. SHORLAND & BRO., Drake Street Works, MANCHESTER.

LIGHTNING CONDUCTORS
Supplied, Erected and Tested. Chimney Shafts Restored, &c.
J. LEWIS, 5 & 6, Great Winchester Street, LONDON, E.C.
TELEPHONE No. 3053 CENTRAL.

BUTTERS BROS., CRANES for CONTRACTORS
WATERLOO STREET, GLASGOW.

"LIMPET" PATENT BOLTS & WASHERS
FOR CORRUGATED IRON SHEETS.

"There is no doubt in our mind that they ought to be regularly specified where iron sheeting is used."—*Vide* BUILDERS' JOURNAL.

PRICE'S PATENT

The latest and most approved Fixing for joining Corrugated Iron Sheeting together.

REGISTERED TRADE MARK
LIMPET

Their great feature is the way in which they adjust themselves to the corrugation and make an **absolutely watertight joint.** They also retard the corrosive action in Galvanized Sheets and combine other advantages.

EXCLUSIVELY ADOPTED BY THE INDIAN GOVERNMENT, THE LEADING RAILWAYS AND MANY OF THE LARGEST MANUFACTURING CONCERNS IN ENGLAND AND THE COLONIES.

Full particulars and samples from the Managing Agents—
WILLIAM JACKS & CO., 5, East India Avenue, LONDON, E.C.
Agents for Scotland: Frank G. Price & Co. 53, Waterloo St., Glasgow.

(*Tenders continued from page vi.*)

Cheel, Staffs.—For new dining hall at Workhouse, for the Guardians of Wolstanton and Burslem Union. Messrs. Ford and Slater, architects, Overhouse Chambers, Burslem:—

J. Cooke	£1,050	0	0
J. Gallimore	898	0	0
J. Grant	880	0	0
W. Grant and Son	850	0	0
G. M. Sambrooke	845	0	0
C. Smith	825	0	0
Colclough and Breeze,* Pitshill	800	0	0
J. Jones	790	13	2

*Accepted.

Chesham.—For the erection of two cottages, for H. J. Mash, Esq. Mr. H. Stanton Webber, F.S.I., architect, 23, Queen Street, Maidenhead:—

B. Stone and Son, 85, High Street, Chesham...	£522	9	6
R. Howard, 4, Broad Street, Chesham	510	0	0
Rust and Ratcliffe,* 1, Higham Road, Chesham	490	0	0

*Recommended for acceptance.

Frinton-on-Sea, Essex.—For erection of new branch bank, for Messrs. Barclay and Co. Messrs. Tomkins, Homer and Ley, architects, Frinton-on-Sea, and 54 and 55, Bishopsgate Street, Without, E.C. Quantities by Mr. R. H. Mayhew, St. Benet Chambers, Fenchurch Street, E.C.:—

T. J. Ward	£2,596
W. Deaves	2,545
H. Everett and Son	2,397
C. J. Parsons	2,380
W. Chambers	2,348
H. W. Gladwell	2,333
A. E. Farr	2,300
G. Dobson and Son	2,296
E. Catchpole and Sons	2,272
T. W. Wash	2,258
C. H. Jones	2,179
G. Grimwood and Sons	2,159
R. Beaumont,* Colchester	2,096

Architect's estimate, £2,185.
*Accepted.

Gateshead.—Accepted for St. George's Parochial Buildings, Durham Road, for the Committee. Mr. R. Wylie, A.R.I.B.A., architect, 36, West Street, Gateshead:—

A. Pringle, Gateshead, £2,890.

Hexham, Northumberland.—Accepted for the work of erecting a new secondary school at Hexham, for the Education Committee:—

R. Blackett and Son, Darlington, £10,370.

Haslemere.—For the erection of a house at Haslemere, for C. Penney, Esq. Frederick J. Hodgson and William Symmonds, architects, 100, High Street, Guildford, and at King's Road, Haslemere:—

A. Ceasar and Son, Liphook ...	£716	10	0
Haslemere Builders, Ltd. ...	672	10	0
D. Fry, Godalming	661	0	0
R. Smith,* Haslemere	615	0	0
F. Milton and Sons, Witley ...	609	0	0
J. Marshall, East Liss	597	10	0

*Accepted.

London.—For the erection of Cosmo Hotel, Southampton Row, W.C.:—

	Extension.	Alterations
Holland and Hannen ...	£14,160	£3,135
J. Carmichael	13,987	3,147
Trollope and Sons and Colls and Sons	13,858	3,245
Holloway Bros.	13,880	2,998
Smith and Sons	13,627	2,937
Howard and Co.	13,385	2,820
Howell J. Williams, Ltd.	13,237	2,747
Sabey and Sons	13,142	2,729

Hull.—For new bottling stores, for Messrs. Moor and Robson's Breweries, Ltd. Messrs. Harbron and Robson, architects, 5a, Spring Bank, Hull. Quantities by Mr. John Watson, Bowlalley Lane, Hull:—

J. H. Fenwick	£1,438
F. Southern	1,410
G. Houlton and Son	1,385
G. Jackson and Sons	1,383
T. Bayes and Son	1,374
J. T. Levitt	1,330
G. L. Scott	1,320
T. Goates and Sons	1,319
P. T. Kettlewell	1,319
M. Harper	1,295
Quibell, Son and Greenwood* ...	1,276

All of Hull.
*Accepted.

Mickley, Northumberland.—Accepted for erection of a United Methodist Church at Mickley Riding, for the trustees. Messrs. Badenoch and Bruce, architects, Emerson Chambers, Blackett Street, Newcastle-on-Tyne:—

Middlemiss Bros., Newcastle-on-Tyne, £1,031 5s.

Shrewsbury.—For new residence, Kingsland, Shrewsbury. Messrs. Dickens, Lewis and Haymes, architects, Shrewsbury:—

Treasure and Sons	£1,810	0	0
H. Price	1,785	19	0
J. Hayes	1,760	0	0
G. H. Bickerton*	1,636	0	0

All of Shrewsbury.
*Accepted.

Stevenage, Herts.—For new C.C. school, Stevenage, for the Herts County Council. Mr. U. A. Smith, county surveyor:—

W. H. Hinkins and Son, Ltd., Royston	£5,565	3	5
C. H. Marriott, Sandridge Siding	4,118	16	0
Hockley and Co., Grantham ...	3,940	3	8
G. Jaggard, Bushey	3,770	8	6
J. L. Glasscock and Sons, Bishops Stortford	3,668	0	0
T. Raban and Son, Baldock ...	3,580	9	10
F. and G. Foster, Norwood Junction	3,579	0	0
Shrouder and Matthews, Stevenage	3,555	0	0
Vail and Shore, St. Albans ...	3,525	0	0
Hacksley Bros., Wellingborough	3,508	0	0
H. Flint, High Wycombe ...	3,480	0	0
Pattinson and Son, Ltd., Westminster	3,470	0	0
F. J. Bailey and Co., Ltd., Ashwell	3,396	0	0
A. N. Coles, Westbourne Park	3,378	16	0
J. Willmott and Son, Hitchin ...	3,294	0	0
G. Henson and Son,* Wellingborough	3,222	13	6
Clark and Son, Cambridge ...	3,163	0	0
T. Higgs, Northampton (withdrawn)	3,112	7	2

*Accepted.

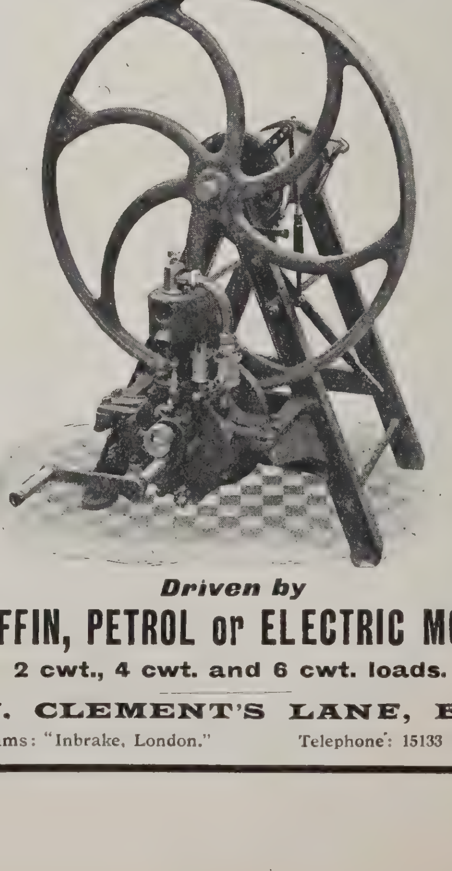
Sutton-on-Sea.—For erection of Wesleyan Church and schoolrooms at Sutton-on-Sea. Messrs. John Wills and Sons, architects, Victoria Chambers, Derby:—

J. Lucas, Peterborough ...	£4,934	0	0
J. T. Turner, Wainfleet	4,138	10	0
Radford and Greaves, Derby...	4,044	7	2
Sprakes and Sons, Doncaster...	3,927	10	0
J. and J. Warner, Mickleover, Derby	3,964	13	2
F. Perks, and Son, Long Eaton,	3,959	19	9
R. Shanks, Chatteris	3,922	10	0
J. Cracknell, Peterborough ...	3,914	15	2
Mawer Bros., Louth	3,891	17	10
Holmes & Richardson, Grimsby	3,891	6	0
F. M. Thompson & Sons, Louth	3,879	2	6
C. Jessop, Boston	3,843	0	0
J. H. Clark, Sutton-on-Sea ...	3,720	5	0
F. Moore, Sutton-on-Sea ...	3,703	10	0
T. Barlow and Co., Nottingham	3,702	17	0
A. Wood, Alford	3,691	10	0
Parker and Son, Boston ...	3,661	0	0
Bosworth and Lowe, Nottingham	3,494	5	6
Maule and Co., Nottingham ...	3,481	0	0
D. Parks and Son,* Grantham	3,465	16	6

*Accepted.

DOLOMENT
Jointless Flooring
And Wall-Covering Material
For High Class Buildings
Guaranteed not to bulge or crack
Fireproof
Impervious
Hygienic
Resilient
Durable
Write for Catalogue and Sample
THE BRITISH DOLOMENT Co. LTD.
1 Caxton House Westminster S.W.

BROOM & WADE
ENGINEERS, LTD.,
HIGH WYCOMBE.
POWER HOISTS for BUILDERS.
Always Ready for Use.
No Skilled Attention Required.



Driven by
PARAFFIN, PETROL or ELECTRIC MOTORS
2 cwt., 4 cwt. and 6 cwt. loads.
27. CLEMENT'S LANE, E.C.
Telegrams: "Inbrake, London." Telephone: 15133 Central.

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about **five days** after the date of this issue.

Unless expressly stated to the contrary, all deposits required for bills of quantities, etc., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

May 19. LIVERPOOL.—Warehouse for Messrs. Watson and Coomber, Paradise Street. Names, accompanied by cheque for one guinea (returnable on receipt of tender), to T. W. Cubbon, architect, 54, Hamilton Street, Birkenhead, before noon on date named.

May 19—June 14. BIRMINGHAM.—Erection of superstructure of buildings in extension of council house, for the corporation. Names and addresses to the architects, H. V. Ashley and Winton Newman, 14, Gray's Inn Square, London, W.C., by May 19, enclosing deposit of £10 10s. Drawings, etc., on and after May 31, at the offices of the architects, and of the joint quantity surveyors, Anthony Rowse, King's Court, 117, Colmore Row, Birmingham, and Hugh Watkins, 13, Gray's Inn Square, London, W.C., and bills of quantities will be sent. Tenders, endorsed, "Council House Extension (Second Contract)," by noon on June 4, to E. V. Hiley, town clerk, Council House, Birmingham. Fair wages clause.

May 24. MOLDGREEN.—Two dwelling houses. Names to James H. Hall, architect, Market Buildings, Market Street, Huddersfield, before date given.

May 24. ST. DENNIS.—Execution of carpentry of two cottages at Hendra Lane, St. Dennis. Plans and specifications of A. Grigg, Glynn Vale, St. Dennis.

May 24. SHEEPRIDGE.—Two dwelling-houses at Sheepridge. Plans and quantities obtainable from J. Berry, architect, 3, Market Place, Huddersfield, to whom tenders are to be sent.

May 24. BRIGHOUSE.—Four-storey mill at Rosemary Mills. Applications for quantities to be made on or before date named, to Sharp and Waller, architects, 32, Bradford Road, Brighouse.

May 24. HULL.—Alterations and additions to Messrs. Bladon's Bon Marche, Ltd., Prospect Street. Plans and specifications to be seen at office of J. J. Adamson, architect, Colonial Chambers, Prince's Dock-side, Hull, to whom tenders are to be sent.

May 24. ABERDARE.—Erection of a gardener's cottage at "Fairfield," Aberdare, for Rees Llewellyn, J.P., C.C. Drawings and specification of J. Llewellin Smith, M.S.A., architect, Aberdare, to whom tenders are to be sent.

May 24. LLANDAFF.—Erection of a pair of semi-detached villas at Llandaff. Plans and specification on deposit of £1 1s. with W. H. Dashwood Caple, F.R.I.B.A., architect and surveyor, 2, Church Street, Cardiff, to whom tenders are to be sent.

May 24. ANCHOR, ST. AGNES (CORNWALL).—Erection of a new farm house at Anchor, St. Agnes. Plans and specifications at the office of Alfred J. Cornelius, M.S.A., architect, Truro. Tenders to be sent to G. H. Chilcott, St. Mary's Street, Truro.

May 24. HEATON NORRIS.—Supplying and fixing a span greenhouse, with boiler-house and potting shed, for the recreation ground at Heaton Moor, for the U.D.C. Particulars of F. W. Brooke, clerk to the council, council offices, Heaton Moor, to whom tenders are to be sent.

May 24. LEEDS.—Execution of builder's work in connection with the installation of a new heating and ventilating apparatus in the town hall, Leeds. Specification, etc., of W. T. Lancashire, city engineer, city's engineer's office, municipal buildings, Leeds. Tenders to be sent to the clerk's office.

May 24. WIGAN.—Extension of the boiler house, engine house, and other works at the electric generating station, Bradford Place, Wigan, for the corporation. Bills of quantities, etc., of James Slevin, electrical engineer, Bradford Place, Wigan. Tenders to be delivered to Harold Jevons, town clerk, Wigan.

May 24. ABERDARE.—Erection of (1) new farmhouse at Tir-Ergyd, Llwydcoed, Aberdare, (2) new farm buildings at Tir-Ergyd, Llwydcoed, Aberdare, for the trustees, Hamlen-Williams Estate. Drawings, etc., on deposit of £1 1s. with J. Llewellin Smith, M.S.A., architect, Aberdare, to whom tenders are to be sent.

May 24. SLAITHWAITE.—Alterations to Nields School for Colne Valley District education sub-committee. Specifications for mason's, joiner's, and plumber's work, obtainable from E. T. Woodhead, divisional clerk, Cloth Hall Street, Huddersfield, to whom tenders are to be sent. Plan and section to be seen on application to head teacher.

May 24. CARLISLE.—Construction of the superstructure of Caldew Viaduct (water spans), near Carlisle, for the Caledonian Railway Co. Drawings, etc., of the company's district engineer, Princes Street Station, Edinburgh, on deposit of £2 2s. Tenders to be sent to J. Blackburn, secretary, Caledonian Railway Company's offices, 302, Buchanan Street, Glasgow.

May 24. CLAPHAM NEWBY, AND DENHOLME.—Execution of the following works:—Builder, joiner, slater, plasterer, plumber, and painter, at the Clapham Newby new school; also drainage, builder, and plumber works at the Denholme district provided school, for the West Riding education committee. Plans, etc., of the West Riding architect, county hall, Wakefield, to which address must be sent in a separate letter a deposit of £1 in each case, addressed to the treasurer.

May 24. WHITEHAVEN.—Several trades in erection and completion of public elementary schools for 712 children, caretaker's residence, etc., for the corporation. Names to Oliver and Dodgshun, architects, Carlisle, accompanied by a deposit of £1 1s. for complete set of quantities, or 10s. 6d. for any separate trade. Also asphalting or tar-paving playgrounds. All further information of the architects, or of W. D. P. Field, education secretary, education offices, town hall, Whitehaven.

May 24. PORTSLADE.—Enlarging the administration block, constructing porter's lodge, water tower, and destructor, forming paths, laying drains, and other work at the Infectious Diseases Hospital, Portslade, for the Corporation of Hove. Drawings, specification, and form of contract and bills of quantities and form of tender at the office of the borough surveyor, Hugh Hamilton Scott, on deposit of £2 2s. Tenders, endorsed "Tender for New Buildings at Hospital, Portslade," by 6 p.m. on May 24, to H. Endacott, town clerk, town hall, Hove.

May 24. CHAPEL-EN-LE-FRITH.—Reconstruction of the following highway bridges for the R.D.C.:—1.—(1) Crowden Brook, (2) Upper Booth, (3) Barber Booth, (4) Yeman's in Edale, (5) Kilhill, (6) Watergate Hope, and (7) Shatton. 2.—(8) Cornheys, (9) Wash, (10 and 11) Blackbrook, (12) Bridgeholme Green, (13) Whitehough, (14) Baghouse, and (15) Collinacre, Combs. Drawings, etc., of the engineer, T. Partington, A.M.Inst.C.E., Bank Chambers, Market Place, Chapel-en-le-Frith, on deposit of £3. Tenders to J. Burton Boycott, clerk to the council, council offices, Chapel-en-le-Frith.

May 24-25. NEWARK.—Erection of a new secondary school for girls at Newark. Plans, etc., prepared by Brewill and Baily, architects, Nottingham. Names, accompanied by deposit of £10, by May 24, with Chas H. Newbald, clerk to the governors, 31, Lombard Street, Newark.

May 25. CUSOP, HAY, HEREFORD.—Erection of a detached residence. Particulars may be obtained of J. J. Price, architect, Hardwicke House, Clifford, Herefordshire.

May 25. ECCLES.—Rebuilding the Town Hall Hotel, Church Street, Eccles, for Watson, Woodhead, and Wagstaff, Limited, Salford. Quantities from the architect, N. Hartley Hacking, 50, Blackfriars, Manchester, on deposit of £2 2s.

May 25. STOREYARD.—Alterations to an existing house at Linacre Lane, Storeyard, for the corporation of Bootle. Plans and specification of the borough engineer. Tenders to be sent to J. Henry Farmer, town clerk.

May 25. RAFFORD, N.B.—Execution of mason, carpenter, slater, plumber, plasterer, and painter and glazier works of additions and alterations to dwelling-house, at Blervie Castle Farm, Rafford. Plans, etc., at the Farm.

May 25. MERTHYR TYDFIL.—Excavation works and construction of stands, etc., at Penydarren Park, for the Merthyr Athletic Club. Plans and specification of O. P. Bevan, architect and surveyor, "Express" Chambers, Merthyr Tydfil.

May 25. WORKSOP.—Erection of wood or wood and iron buildings for treatment of phthisical patients (male and female) at Kilton Hill, Worksop. Further information of James Snow Whall, clerk, 66, Bridge Street, Worksop.

May 25. CWM, NEAR EBBW VALE.—Erection of a new chancel or organ chamber, extending the nave, and building a new north aisle to the parish church of Cwm, near Ebbw Vale, for the Rev. J. Ll. Croft. Plans, etc., on deposit of £2 2s., of E. M. Bruce-Vaughan, F.R.I.B.A., architect, Cardiff, to whom tenders are to be sent.

May 25. CORSHAM.—Alterations and additions to shop in High Street for Mr. Caleb Davis, boot manufacturer. Plans and specification to be seen at office of W. H. Bromley, surveyor, 3, Pickwick Road, Corsham, between hours of 9 and 5 after May 18. Tenders to Mr. Davis, before noon on date given.

May 25. SUTTON-IN-ASHFIELD.—Construction of retort house, retort bench, coal elevator and conveyor, hoppers, etc., in connection with the gasworks extension, for the U.D.C. Names and addresses to Corbett, Woodall, and Son, Palace Chambers, Bridge Street, Westminster, S.W., with deposit of £3 3s. Tenders to John D. Fidler, clerk to the council, council offices, Sutton-in-Ashfield.

May 25. NOTTINGHAM.—Alterations at Bagthorpe Workhouse, for the corporation. Particulars and quantities on deposit of £2 2s. with Arthur Marshall, A.R.I.B.A., architect, King Street. Tenders to G. Muncaster Howard, clerk to the board, poor law offices, Nottingham. Fair wages clause.

May 25. LONDON.—Erection of rooms and alteration of the caretaker's present quarters at the central library, Kensington High Street, for the corporation. Specification and drawings at the borough engineer's office, town hall, Kensington. Tenders to be delivered to Wm. Chambers Leete, town clerk, town hall, Kensington, W. Fair wages clause.

May 25. SHEERNESS.—Erection of a mineral water factory, stables, etc., at Railway Road, for the Sheerness and District Licensed Victuallers' Mineral Water Company, Ltd. Plans and specification at the company's office, 49, Alma Street, Sheerness. Tenders, endorsed outside "New Factory," to William Golder, secretary, Sheerness, by 9 p.m. on May 25.

May 25. PETERHEAD.—Mason, carpenter, slater, plumber, plaster, painter, and glazier, steel and iron and heating works of buildings to be erected in Marischal Street and Thistle Street, Peterhead, containing accommodation for new post office, shops, dwelling-houses, etc. Plans, etc., with James Watt, C.E. and architect, 26, Marischal Street, to whom tenders are to be sent.

May 26. BARROW-IN-FURNESS.—Construction of movable partitions, etc., at the technical school, for the corporation. Bills of quantities and other particulars at the borough engineer's office, town hall, where tenders are to be delivered.

May 26. LOCKWOOD.—Two semi-detached houses, Woodside Road, Lockwood. Plans and quantities obtainable from May 18, from J. B. Abbey and Son, architects, 34a, New Street, Huddersfield, to whom tenders are to be sent.

May 26. LIVERPOOL.—Erection of the new out-patients' department, situate in Pembroke Place and Brownlow Street, Liverpool, for the committee of the Royal Infirmary. Plans, etc., on deposit of £2 2s. with the committee's architect, J. Francis Doyle, 4, Harringdon Street, Liverpool, to whom tenders are to be sent.

May 26. CAMBERWELL.—Construction of a new underground record room, etc., at the town hall, for the corporation. Specifications and particulars of W. Oxtoby, borough engineer, town hall, Camberwell, on deposit of £1 1s. with the borough treasurer. Tenders to be delivered to C. William Tagg, town clerk.

May 26. RHONDDA VALLEY.—Erection and completion of thirty-two houses and formation of road, surface water drains, etc., at Clifton Road, Pencelli, Treorchy, Rhondda Valley, for the Clifton Road Building Company. Plans, etc., of W. D. Morgan, M.S.A., architect, 194, Ystrad Road, Pentre, to whom tenders are to be delivered.

May 27. BARGOED.—Erection of a chapel-schoolroom at Bargoed, for the English Wesleyan Church. Plans, etc., on deposit of £1 1s. with Wm. Harris, architect and surveyor, Bank Chambers, Bargoed. Tenders to be sent to the secretary, W. Parry Williams, M.P.S., Medical Hall, Bargoed.

May 27. EDINBURGH.—Internal reconstruction of the Royal Institution Building, Edinburgh (1st contract), for the commissioners of H.M. Works and Public Buildings. Drawings, etc., on deposit of £1 1s. with the principal architect, H.M. Office of Works, Parliament Square, Edinburgh. Tenders to the secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W.

May 27. WHALLEY.—Erection of houses for the clerk of works and clerk and steward, two lodges, and eight attendants' cottages, for the Lancashire Asylums Board. Plans, etc., of the architect, Henry Littler, 16, Ribblesdale Place, Preston, on deposit of £2. Tenders must be delivered to Harcourt E. Clare, clerk to the committee of visitors, county offices, Preston.

May 27. CHARTHAM DOWNS, near CANTERBURY.—Alterations and improvements to laundry at the Kent County Lunatic Asylum, Chartham Downs, near Canterbury, for the Kent County Asylums Committee. Drawings and specifications, etc., of W. J. Jennings, architect, 4, St. Margaret's Street, Canterbury, on deposit of £5. Tenders to Francis R. Howlett, clerk to the Asylums Committee, 9a, King Street, Maidstone.

May 28. CHELMSFORD, ESSEX.—Taking down and re-building, etc., two small bridges, for the C.C. Plans, etc., of Percy J. Sheldon, M.Inst.C.E., county surveyor, Chelmsford, to whom tenders are to be sent.

May 28. ST. TUDY.—Erection of a rectory at St. Tudy, for the Rev. C. Bridgewater. Plans and specifications at Wetherham, St. Tudy. Tenders to be delivered to E. H. Sedding, F.R.I.B.A., A. S. Parker, F.R.I.B.A., 20, George Street, Plymouth. Builders tendering apply to rector for date of appointment.

May 28—June 15. DARTFORD (KENT).—Erection of a new secondary school at Dartford, to accommodate 200 girls, for the education committee. Plans, etc., prepared by the committee's architect, W. H. Robinson, M.S.A., at the offices of the committee on and after June 1. Names, accompanied by deposit of £2, by noon on May 28, to Fras. W. Crook, secretary, Kent, Education Committee, Caxton House, Westminster, to whom tenders are to be sent.

May 28—June 12. SITTINGBOURNE (KENT).—Erection of a new council school to accommodate 400 children, at Sittingbourne, Kent. Plans, etc., prepared by the committee's architect, Wilfrid H. Robinson, M.S.A., at the offices of the committee on or after June 1. Name, accompanied by deposit of £1, by noon on May 28, to Fras. W. Crook, secretary, Caxton House, Westminster, S.W. Tenders to the school correspondent, H. Willis, 14, High Street, Sittingbourne, Kent.

May 28—June 12. DUNTON GREEN, NEAR SEVENOAKS, KENT.—Erection of a new council school, to accommodate 250 children, at Dunton Green, near Sevenoaks, Kent, for the education committee. Plans, etc., prepared by the committee's architect, Wilfrid H. Robinson, M.S.A., at the offices of the committee on or after June 1. Name, accompanied by a deposit of £1, by noon on May 28, to Fras. W. Crook, secretary, Caxton House, Westminster, S.W. Tenders to the school correspondent, A. E. Partridge, Longford Brow, Dunton Green, Sevenoaks, Kent.

May 29. CRYNANT (WALES).—Erection of a new church at Crynant. Plans and specification, and bills of quantities, of J. Cook Rees, architect, Parade Chambers, Neath. Tenders to the Rev. J. D. James, Vicarage, Cadoxton, near Neath.

May 29. SEVEN SISTERS, near NEATH.—Erection of a new church at Seven Sisters, near Neath. Plans and specification and bill of quantities of J. Cook Rees, architect, The Parade, Neath. Tenders to E. Evans Bevan, Cadoxton House, Neath, endorsed "Tender for church," by May 29.

May 29. ABERDARE.—Repairing, painting, and renovating Calvaria Welsh Baptist Chapel, Aberdare, for the committee. Specification and particulars of E. G. Henton, architect, 22, Cardiff Street, Aberdare. Tenders to be sent to Daniel Griffiths, secretary, 30, Pendarren Street, Aberdare.

May 31. NEWBRIDGE.—Erection of schools at Newbridge. Plans, etc., at office of Francis Bergin, B.E., 36, Westmorland Street, Dublin. Bills of quantities from James Mackey, 58, Dame Street, Dublin, on payment of £1 1s.

May 31. BRIXHAM, DEVON.—Erection of a residence adjoining the Berry Head Road, at Brixham, Devon, for Charles Hellyer, J.P. Drawings, etc., of Fred. Wm. Vanstone, C.E., architect and surveyor, Palace Chambers, Paignton, on deposit of £3 3s.

May 31. CHESTER-LE-STREET.—Erection of a secondary school for the Durham C.C. Plans, etc., at the education architect's office, Shire Hall, Durham. Bills of quantities of J. A. L. Robson, secretary for higher education, Shire Hall, Durham, where tenders are to be sent.

May 31. ADELAIDE and WINDSOR (IRELAND).—Construction and erection of a running shed for engines, with workshops, offices, etc., close to Adelaide and Windsor station, for the Great Northern Railway Company (Ireland). Drawings (eight in number) and specification of W. H. Mills, engineer-in-chief, Amiens Street Terminus, Dublin, or of the district engineer, Belfast, on payment of £2 (not returnable). Tenders to T. Morrison, secretary, secretary's office, Amiens Street Terminus, Dublin.

May 31. BATH.—Execution of (1) repair of sustaining and fence walls on the Bath and Bristol main road, near Saltford Station; (2) repair of walls on the east approach to new bridge over the River Avon, on Bath and Bristol main road; (3) repair of sustaining and fence walls at Oldford two bridge, on the Bath and Frome main road; for the Somerset C.C. Specifications, bills of quantities, and forms of tender, of H. T. Chapman, county surveyor, 1, Chapel Row, Bath, to whom tenders are to be sent.

No date. SUTTON MANDEVILLE.—Repairs to the Rectory. Particulars and specification on application to A. T. Love, Hinton St. George, Somerset.

No date. DENHOLME.—Conversion of shops into dwelling-houses, New Road, Denholme. Plans and quantities obtainable from May 20 to May 25, at office of G. Reginald Oddy, architect, Stone Lodge, Nowthrowram, Halifax.

No date. ACCRINGTON.—Various works in erection and completion of new schools in Manor Street and Alice Street, for the education committee. Plans and drawings, etc., on application to Wm. J. Newton, M.S.A., A.M.I.C.E., architect to the education committee, town hall, on deposit of £5. Tenders to be delivered to A. H. Aitken, town clerk.

ENGINEERING.

May 24. ASHBORNE.—Supplying a 20 b.h.p. suction gas engine and suction gas producer for the U.D.C. Tenders to be sent to the clerk.

May 24. FARNWORTH.—Supply and laying in position, etc., of extra high and low tension cables in connection with extensions at electricity works; also supply and entire fixing into position of ten circuit breakers in connection with the additions to the switchboard, for the U.D.C. Plans and drawings and specifications and quantities from R. B. Leach, electrical engineer, Electricity Works, Farnworth. Tenders to W. Tyldsley, clerk, council offices, Farnworth, S.O.

May 27. BLORE, NEAR MARKET DRAYTON.—Construction of a covered concrete reservoir of 300,000 gallons capacity at Blore, for the Market Drayton Water Company. Specification, etc., on deposit of £1 with B. S. Hawthorn, solicitor, secretary to the company, Market Drayton, to whom tenders are to be sent.

IRON AND STEEL.

May 25. LONDON (for India).—Supply of 1, wheel and axles; 2, Laminated springs, for the Bombay, Baroda, and Central India Railway. Tenders must be made on forms, copies of which, with specifications may be had of C. Crommelin, secretary, Gloucester House, 2, 3, and 4, Bishopsgate Street Without, London, E.C., on payment of 21s. each (which will not be returned).

PAINTING.

May 24. LEEDS.—Painting exterior, polishing shop fronts, etc., washing down interior of Market Hall, Vicar Lane, Leeds. Particulars at the city engineer's office, Municipal Buildings, Leeds. Tenders must be sent to the town clerk's office.

May 24. YSTRAD RHONDDA.—Painting and decorating Bethel Welsh Calvinistic Methodist Chapel, Ystrad Rhondda, for the trustees. Specification of W. D. Morgan, M.S.A., 194, Ystrad Road, Pentre, Rhondda, to whom tenders are to be sent.

May 25. PERTH.—Painting the club premises, internally and externally, for the committee of the Wyndham Constitutional Club. Specifications of the secretary at the Club, to whom tenders are to be sent.

May 26. BARROW-IN-FURNESS.—Painting and decorating the ground floor rooms at the technical school, for the corporation. Bills of quantities and other particulars at the borough engineer's office, town hall, where tenders are to be delivered.

May 29. LIVERPOOL.—Painting and decorating the Highfield infirmary, situate at Knotty Ash, Old Swan, for the select vestry. Specifications, etc., of H. J. Hagger, vestry clerk, parish offices, Brownlow Hill, Liverpool, to whom tenders are to be sent.

PLUMBING & SANITARY

May 20—June 4. ELSECAR.—Construction of percolating filters, valve chambers, effluent drains, and appurtenant works at the sewage farm, Elsecar, for the Hoyland Nether U.D.C. Drawings, etc., after May 20, and on deposit of £2 2s. with Frank Hewitt, engineer and surveyor to the council, town hall, Hoyland, near Barnsley, to whom tenders are to be sent.

May 24. LONG ASHTON (SOMERSET).—Execution of additions to the sewage disposal and sewerage works in Long Ashton, for the R.D.C. Plans and specification of the engineer, A. P. I. Cotterell, M.Inst.C.E., 28, Baldwin Street, Bristol. Bill of quantities and form of tender from the engineer, on deposit of £1 1s. Tenders to Albert E. Hicks, union offices, Flax Bourton.

May 24. ASHTON-ON-MERSEY.—Construction and erection of sedimentation tanks, storm-water tanks, engine-house, and sundry other works at the sewage farm, Ashton-on-Mersey, for the U.D.C. Plans, etc., on deposit of £3 3s. with the engineer, A. H. Mountain, A.M.Inst.C.E., 16, John Dalton Street, Manchester. Tenders to J. O. Barrow, clerk to the council, U.D.C. offices, Ashton-on-Mersey.

May 25. KIDDERMINSTER.—Construction of stone-ware pipe sewers, manholes, flushing chambers, and other works in connection therewith, for the R.D.C. :—350 yards of 12-in. drain pipes, 3,040 yards of 9-in. drain pipes, 2,020 yards of 7-in. drain pipes. Plans, etc., of W. Fiddian, F.S.I., civil engineer, Old Bank Offices, Stourbridge, on deposit of £3 3s. (cheque). Tenders to be sent to Fredk. Burcher, clerk to the R.D.C., Kidderminster.

May 26. SUNDRIDGE.—Execution of work in connection with the domestic hot-water supply at the union workhouse at Sundridge, for the Sevenoaks Union. Plans and specifications of George F. Carnell, clerk to the guardians, 130, High Street, Sevenoaks, to whom tenders are to be sent.

May 26. FINCHLEY.—Construction of bacteria beds, septic tanks, and sludge-lifting plant, together with channels, culverts, pipes, valves, and other appurtenant works, for the U.D.C. Drawings, etc., on deposit of £3 3s. with the engineer and surveyor, Church End, Finchley, N. Tenders to be sent to E. H. Lister, clerk to the council, council offices, Church End, Finchley.

May 28. SKIPTON.—Carrying out the Cononley sewerage scheme, for the R.D.C. Plans, etc., of A. Rodwell, the council's engineer, and schedule of quantities on deposit of £2 2s. Tenders to be delivered to M. R. Knowles, clerk to the council, Skipton.

ROADS AND CARTAGE.

May 24. BILLERICAY (ESSEX).—Steam road rolling for the R.D.C. Printed form of the surveyors :—F. E. Ennals, Shelley Road, Hutton, or R. J. W. Layland, Billericay. Tenders to be sent to C. Edgar Lewis, clerk, New Road, Brentwood.

May 24. STRATTON ST. MARGARET.—Making up Pump Lane, Stratton St. Margaret, for the Highworth R.D.C. Plans and specifications of John P. Kirby, clerk to the Council, 100, Victoria Road, Swindon, to whom tenders are to be sent.

May 24. BILLERICAY (ESSEX).—Supplying Guernsey granite, Queenast granite, Kentish rag, flints, and gravel, for the R.D.C.. Forms of tender of the surveyors :—F. E. Ennals, Shelley Road, Hutton, Essex ; or R. J. W. Layland, Billericay. Tenders to be sent to C. Edgar Lewis, clerk, New Road, Brentwood.

May 24. SALE.—Draining, levelling, metalling, kerbing, channelling, paving, macadamising, flagging, asphalting, and making good roads and passages, for the U.D.C. General conditions, plans, etc., on deposit of £2 2s. with William Holt, A.M.I.C.E., engineer and surveyor, council offices, Sale. Tenders to be sent to D. Hallewell, clerk to the council, council offices, Sale.

May 25. LEEDS.—Carrying out new flagging, re-flagging, crossings setting and channels, and other works incidental thereto, for the corporation. Forms of tender and specification at the highways office, 155, Kirkstall Road, Leeds. Tenders must be delivered at the town clerk's office, town hall, Leeds.

May 25. WINSFORD (CHESHIRE).—Supply and delivery of stone for roads during the period ending March 31, 1910, for the U.D.C., as follows :—500 tons, more or less, of granite macadam, broken to pass 2½-in. gauge ; 200 tons, more or less, of granite macadam, broken to pass 1½-in. gauge ; 50 tons, more or less, granite chippings, broken to pass ¾-in. gauge ; 50 tons, more or less, granite chippings, broken to pass ½-in. gauge. Forms of tender and further particulars from James Wilkinson, surveyor, Winsford. Tenders to be sent to John H. Cooke, clerk to the council, Russell Street, Winsford, Cheshire.

May 26. WOOD GREEN.—Making-up (1) Dukes Avenue (from the Parish Boundary to Grove Avenue), and (2) Wellesley Road, for the U.D.C. Plans, sections, and specifications, and bills of quantities, on application to the surveyor, town hall, Wood Green, upon deposit of £1 1s. with Wm. P. Harding, clerk to the council, town hall, Wood Green, to whom tenders are to be sent by 5 p.m. on May 26. Fair wages clause.

May 26. CHISWICK.—Execution wood-paving part of High Road, Chiswick (about 14,500 sq. yds.), by (1) relaying forthwith, or alternatively, (2) relaying now and maintaining (including such further relays as may be necessary) for periods of 10, 12, 15, 17, or 20 years, for the U.D.C. Particulars of Edward Willis, A.M.I.C.E., surveyor, town hall, Chiswick. Tenders to be sent to Ernest F. Collins, clerk of the council.

May 27. ASHFORD, KENT.—Supplying 1,160 cubic yards (more or less) of 2in. gauge broken granite, as per form of tender, to be obtained of the surveyor. Tenders (with samples), endorsed "Tender for Granite," by 5 p.m. on May 27, to William Terrill, surveyor, 5, North Street, Ashford, Kent.

May 27. ASHFORD (KENT).—Supply and delivery of 380 cubic yards (more or less) of unbroken Kentish ragstone, and 400 cubic yards (more or less) of coarse gravel or pit flints, for the U.D.C. Further information of William Terrill, surveyor, 5, North Street, Ashford, Kent, to whom tenders (with samples) are to be sent.

May 29. WAKEFIELD.—Supply and delivery at Wakefield of granite or Whinstone macadam and slag, grit stone and granite setts, pitch, creosote oil, and stone flags, for the corporation. Form of tender, etc., from the city surveyor. Tenders must be sent to W. W. Greenhalgh, town clerk.

June 1. HORBURY.—Making up Manor Road, for the U.D.C. Drawings, etc., on deposit of £1 1s. with J. H. Drew, engineer and surveyor, town hall, Horbury. Tenders to T. Barker, clerk to the council, town hall, Horbury.

MISCELLANEOUS.

May 24. ARBROATH.—Supplying cast-iron and fireclay pipes, coals, bricks, lime, cement, brass-work, oils, pavement, kerb, channel, and setts, from June 1 1909, to May 31, 1910. Schedules of quantities and all information of P. C. Smith, burgh engineer, burgh engineer's office, Arbroath. Tenders to be lodged with W. K. Macdonald, town clerk, Arbroath.

May 25. LONDON.—Supply and delivery of glass and plywood tablets and taper blocks, for the L.C.C. Full particulars on application to G. L. Gomme, clerk to the L.C.C., County Hall, Spring Gardens, S.W.

May 26. MEMBURY.—Concreting the watercourse through the village of Membury, for the R.D.C. Specification on application to G. A. Millard, district surveyor. Tenders to be sent to Cecil Forward, clerk, Axminster.

No Date. WEMBLEY PARK, MIDDLESEX.—Supplying about 200 yards of 6ft. close pale oak fencing, about 50 yards ditto, 3ft. 6ins., and about 56 yards 3ft. 6in. gun picket ditto. Applications, accompanied by deposit of 10s., to D. B. Hedderwick, architect, 38, Great James Street, Bedford Row, W.C.

THE
Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,
General Manager and Secretary.
Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE Junior Assistant desires post in small office south of Midlands; working drawings, details, help quantities; good draughtsman and tracer; excellent references; salary 22s. per week.—Architect, 36, Devonshire Road, Cambridge.

ACADEMY (Royal) exhibitor prepares perspectives on moderate terms; specimens sent; also designs, plans from rough sketches, drawings, tracings, competition work, etc.—Box 4983, Builders' Journal Office.

ADVERTISER, with six years' practical experience and a knowledge of bookkeeping and office routine, desires situation in builder's or estate agent's office.—C. J. Mounter, 24, Hillfield Road, West Hampstead, N.W. 5028

A "B.B.B."—The British Business Bureau (Architects). 140, Fleet Street, E.C., can recommend several first-class assistants. Particulars free on application. No fees. 5066

ADVERTISER, (30), seeks situation in Drawing Office; rapid tracer, colourist, good printer; used to making tracings for reproduction. Experience gained in architects' offices.—Box 5057, Builders' Journal Office.

ARCHITECT. Surveyor and Constructional Engineer fully qualified, seeks engagement, 15 years' experience, moderate salary; would represent good constructional firm.—Box 5063, Office of the Builders' Journal.

ADVERTISER seeks position as junior assistant, 3½ years' experience; excellent draughtsman, surveying, levelling, book-keeping, general office routine; highest testimonials; low salary.—Box 5045, Builders' Journal Office.

AN experienced young architect, with small connection, desires position or work at own office; prolific designer and rapid draughtsman; specifications, etc.—"C.," 24, Hainthorpe Road, West Norwood, S.E. 5026

AN Architect's Assistant desires re-engagement; town or country; neat and quick draughtsman; thoroughly capable; moderate salary.—M. P., 358, New Cross Road, S.E.

APPOINTMENT as Improver (19), just completed three years' articles with architect; good draughtsman, tracer, etc.; excellent testimonials; moderate salary.—J.S.C., 10, Almeric Road, Clapham Common. 4993

ARCHITECT'S Assistant desires re-engagement in a good London office; eight years' experience; good references; experience in competition work.—B. E. Atkinson, jun., 14, Rosslyn Hill, Hampstead, N.W. 5018

ARCHITECT'S Assistant (27), good draughtsman and colourist; contract drawings, designs, details, perspectives, surveys; travelling studentship winner; specimens.—H. C. S., 65, Grove Road, Norwich 5025

ARCHITECT'S Assistant (24), disengaged; Inter. R.I.B.A., 6½ years' varied experience, town and country; working drawings, details, and perspectives; levelling, reinforced concrete details; assist with quantities.—Riches, 35, Culverden Road, Balham, S.W. 5013

ARCHITECT'S Assistant (23), 6½ years' experience; excellent draughtsman, working drawings, details, specifications, surveying; assist with quantities; first-class references.—H.B., 23, Springfield Road, Bury St. Edmunds. 5001

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill, S.W. 4992

ARCHITECT'S Assistant (23), excellent draughtsman, desires re-engagement; six years' first-class experience; contract, detail and competition drawings, specifications, perspectives (exhibitor at Royal Academy); prizeman for architectural design; highest references; moderate terms.—F.E.T., 10, Cobham Road, Kingston-on-Thames. 5015

ARCHITECT, 32, qualified, seeks any position where his services would be available; energetic; disengaged; mod. salary.—Box 5006, Builders' Journal Office.

ARCHITECT'S Assistant, nine years' experience; bronze and silver medallist; acted clerk of works; perspective, details, etc.; assist on quantities.—French, 23, Port Street, S.W.

ARCHITECT'S Assistant seeks engagement; 14 years' experience; plans, details, specifications, quantities, surveying, dilapidations, and levelling; excellent references.—C. G., "Brooklyn," Leas Road, Guildford.

ARCHITECT'S Assistant disengaged, good allround; design, construction, specification, supervision, dilapidations, surveying, etc.; excellent testimonials.—H., "Bowood," Heronsgate, Ricksmansworth, Herts.

ARCHITECT'S Assistant (24), eight years' experience; chiefly schools; intermediate R.I.B.A., first-class design, construction, architecture, ornament; folio of drawings sent for approval.—Vivian S. Whitaker, Barcroft, Bromsgrove, Worcester. Salary 49s.

ARCHITECT'S Assistant (23), capable draughtsman; good constructionalist; would go on trial for permanency; town or country; temporary work 35s.—H. J. W. E., 1, St. Dunstan's Road, Hanwell, W.

ARCHITECT'S Assistant seeks engagement; good draughtsman; working drawings, details, surveying, levelling, and quantities; eight years' experience.—Owen, "Meadowside," New Queen Street, Chesterfield.

ARCHITECT'S Competent Assistant desires engagement; many years' practical experience; designs, details, specifications, superintendence, surveying; two guineas.—Arch, 23, Lavenham Road, Wandsworth, S.W.

ARCHITECT and Surveyor's junior assistant (22), 4½ years' experience, desires re-engagement; neat and expeditious draughtsman; working drawings, surveying and levelling.—Williams, "Brynderwen," Pontyclun, Glam.

A.R.I.B.A., disengaged shortly, London training; chief and senior assistant in leading provincial offices; expert designer, and experienced in all branches.—A. G., "Beverley," Yardley Wood Road, Moseley, Birmingham.

ARCHITECT'S Assistant (22), desires re-engagement in London office; contract drawings, details, surveys, double scholarship holder; Stage III. Building Construction.—Smeed, 24, West Ham Lane, Stratford, E. 5050

ARCHITECT, prepares designs, working drawings, specifications, on moderate terms; assistance rendered, town or country.—Box 5,036, Builders' Journal Office.

ARCHITECT'S Junior Assistant (20), 4½ years' experience, West End and country offices; working drawings, details, perspectives, competitions, general office routine; excellent draughtsman and tracer. Highest references; salary 25s.—G. W. S., 26, Cowley Road, Ilford, Essex. 5056

BUILDER'S Clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N. 5037

BUILDER'S Book-keeper, 9 years' excellent reference from present employer. All books, double entry, prime costs, accounts, trading and profit and loss accounts, etc.—Box 5049, Builders' Journal Office.

BUILDER'S Assistant (30), wants position with large provincial builder, accurate surveyor and estimator; extensive experience with architects' settlement and accounts has revised present temporary employers' routine, and obtains accurate and immediate information on all matters; gives entire satisfaction.—Malpas, Much Hadham, Herts. 5071

BUILDER'S and Contractor's Assistant (29), thirteen year's experience, all branches, including roads and sewers, asphalting, etc.; plans, specifications, quantities and accounts, shorthand, and typewriting.—Box 5069, Builders' Journal Office.

CLERK (24), requires situation in building trade; 7 years' commercial experience; 4 years' in building trade; bookkeeping, correspondence, and general routine; excellent references; moderate salary for prospects.—Box 5068, Builders' Journal Office.

CARPENTER, and French polisher wants situation, young, capable workman, good refs.; moderate wage.—C.P., 21, Redstone Road, Redhill, Surrey. 4989

CLERK of Works, shortly disengaged, well up in all trades; levelling and surveying; best references; abstainer.—R. E., 3, Oakfield Road, Stroud Green, London, N. 5052

DRAUGHTSMAN (26), home or abroad, neat, quick tracer and colourist, working drawings from rough sketches, bookkeeping and general office routine; foreign experience.—H.W., 64, Crofton Road, Camberwell, S.E. 5003

ENGINEER, 29, disengaged; exp. in designs, detail, drawings, calculations, quantities, structural steelwork, fireproofing, reinforced concrete, bridges, buildings.—Box No. 4991, Builders' Journal Office.

ENGINEER, mechanic, desiring change, requires permanent situation on staff, official or private; thorough all-round general experience; married.—J.G., 86, Bathurst Gardens, Willesden, N.W. 5011

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W. 4951

JUNIOR (20), 4 years' experience, good draughtsman, quick and accurate leveller and surveyor, building, sewerage, water supply, abstracting, billing quantities, typewriting, shorthand; salary no object.—S.F.H., 16, Dodington, Whitchurch, Salop. 5032

JUNIOR Assistant, disengaged; good knowledge of domestic architecture.—Reply, J. R. F., 248, Sandycombe Road, Kew Gardens, S.W. 5031

MASONRY, manager or foreman, machinery and all details, all classes of masonry work; London and country experience; terms moderate.—G.B., 38, Napier Road, Tottenham, London. 4975

FRENCHMAN, Architectural Draughtsman, having an office at Rouen (France) is willing to accept representation of English articles used in building.—Write Ledicn, 39, Petherton Road, Highbury, London, N.

SHOP-FITTING, or high-class joinery, advertiser (38), seeks situation as foreman in shop-fitting or high-class joinery works; can take full control; 9 years' references; abstainer.—Box No. 5007, Builders' Journal Office.

SIGNWRITER, Grainer and Decorator, good; fill up time, Paint, Paper; 10 years' reference; permanency, or estate; can take charge.—B.B., 58, Moffatt Road, Thornton Heath. 5070

TYPEWRITING, tracing, shorthand, good class work, requiring intelligence and accuracy, can be undertaken in spare time by architect's clerk.—Address, "Typist," 2, Marsham Street, Westminster. 5043

YOUTH wants situation, surveyor's or builder's office; four years' experience; working up quantities, measuring up, good draughtsman; scholarship holder; excellent testimonial.—J. R. O., 233, Essex Road, N. 5017

Appointments Vacant.

ARCHITECT requires temporary Assistant early in June. Must be experienced in finishing competition drawings, public buildings.—Apply, stating salary, to Box 5065, Builders' Journal Office.

FIRST-CLASS mould maker, for artificial stone works required, and to act as foreman; joiner preferred; good wages, house and garden, and permanent situation to the right man; apply, stating wages and experience, to Edwin J. Pearce and Co., De Montfort Chambers, Horsefair Street, Leicester. 5039

REQUIRED, experienced working manager, one prepared to invest in a small paying brick works in Carmarthenshire.—Apply first, Thomas, 71, Moy Road, Cardiff. 5042

WANTED, in country builder's office, (Somerset), competent and confidential clerk, married man preferred; permanency to suitable man. Apply, stating wages and references, to Box 5038, Builders' Journal Office.

WANTED: Builder's Clerk, young man; state age, experience, and wage wanted; copies of testimonials only, which will not be returned.—Box 5051, Builders' Journal Office.

NORTHAMPTONSHIRE COUNTY COUNCIL EDUCATION COMMITTEE.

An Assistant will shortly be appointed in the Education Surveyor's Department. He must be a good draughtsman, and accustomed to inspect and report on work in progress. Experience in an architect's or a Surveyor's office is essential.

The salary offered is £120, rising by £5 increments to £150 per annum.

Forms of application may be obtained from the undersigned, and must be returned not later than Saturday, May 8, 1909.

J. L. HOLLAND,
Secretary of Education.
County Education Offices,
Northampton. 4998

WANTED.—Two smart young men for travelling Lancashire and Yorkshire, to sell high-class, widely advertised specialities used in the building trade. Knowledge of and connection in, the Varnish and Enamel trade a desideratum, but not absolutely necessary. Good opening for really live travellers.—Apply Box 5058, Builders Journal Office.

YOUTH wanted for Engineer's drawing office; accustomed to handling drawings.—Apply, stating age, experience, salary required, to Box 5064, Builders' Journal Office.

May 26, 1909. Volume 29. No. 746.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders: Playing at Town Planning; The Smoke Nuisance; The Copyright Question; Iona, Exeter, and Cologne, 489; L.C.C. School Architecture; A Triple Alliance - 490
Smoke, the Enemy of Buildings. By Sir W. B. Richmond, K.C.B., R.A. - - - 490
Church Building Ethics and Æsthetics. By Edward Warren, F.S.A. - - - - 492
Our Plate - - - - - - - - 493
Architectural Copyright - - - - - 493
The Institute Members' Club - - - - 494
Notes on Competitions - - - - - 495
Correspondence: Bridges of Reinforced Concrete; The Taxation of Land Values - 495
The Selfridge Store, Oxford Street - - - 495
Enquiries Answered: Books on Steel Towers; French Polishing; Assignment of Property; An Analysis to Find CO_2; Green Paints Fading; Continuing Offence; Rights of Adjoining Owner, 497; Joists to carry Angle Bay and Turret; York, Beverley, and Howden; Convalescent Homes; Sketching Tours - - - - - - - - - 498
Societies' Reports - - - - - - 499
New Offices, No. 1, Lloyd's Avenue, E.C.
Proposed New Buildings - - - - - 500
Buildings in Progress and Completed - - 500

CONCRETE AND STEEL SECTION.

The Economy of Reinforced Concrete - - 501
Steel Construction at the Selfridge Store - 502
Tests of Reinforced Concrete Beams at McGill University - - - - - - - 504
How Cement is Made - - - - - 508
A Guide to Reinforced Concrete Design - 509
Stresses in Roof Trusses. By Max Am Ende 510
Federation News - - - - - - 511
Coming Events - - - - - - - 512
Tenders - - - - - - - vi., viii.
Complete List of Contracts Open xxv.—xxviii.

ILLUSTRATIONS.

The Progress of the Campanile of St. Mark, Venice - - - - - - - - - 491
Proposed Library and Institute, Dolgelly. Edmund A. Fermaud, Architect - - 492
Square of Twelve Houses, Hampstead Garden Suburb. Geoffry Lucas, A.R.I.B.A., Architect, 493 and Centre Plate
House at Chalfont St. Giles. Forbes and Tate, Architects - - - - - - - - 494
The Selfridge Store, Oxford Street. R. Frank Atkinson, F.R.I.B.A., Architect, 496, 502, 503, 504, 505, 506 - - - - - 507
Offices, 1, Lloyd's Avenue, E.C. Chatterton and Couch, AA.R.I.B.A., Architects 499, 500
Joists to Carry Angle Bay and Turret - - 498
Diagram for Calculating Depth of Slabs and Beams - - - - - - - - 509
Stresses in Roof Trusses - - - - 510

Playing at Town Planning. The latest American invention is a joyous new round game for architects. The Committee on Entertainment of the Rhode Island Chapter of the American Institute of Architects arranged among its members a town-planning competition. The idea in itself involves no great amount of stress or strain on the native genius for inventiveness. The novelty (if any; and we rather suspect the existence of some prior claims) consists in the conditions of the competition. "About ten days before the date of the meeting, the committee sent out to all members of the chapter a blue-print, showing a plot of land near Merino, upon which it was assumed that a model village should be built. The idea was that upon the plateau, overlooking a valley on three sides, houses would be needed for mill-workers employed in manufactories situated in the valley at the right. The conditions given were very few: those members desiring to compete were required to trace the survey, transfer it to a drawing-board, and bring the latter, with the necessary drawing instruments and materials, to the meeting; a general block plan of the village was to be shown, at a scale of 60ft. to the inch, while on the margin of the drawing plans and perspectives of the various types of houses used were to be included. Rendering could be in any medium. The men competing were free to make any preliminary sketches in studying the problem, but none of this material was to be brought to the meeting." The time allowed was an hour and ten minutes; and at the end of that time the real ordeal for the competitors began. "Each competitor was then required to explain his solution of the problem, amid the freest discussion and comment by the jury." The competitors are to be congratulated on their pluck in thus offering themselves as victims to the lash, or to a hardly less painful endurance of embarrassing compliments, or to the dull dolour that ensues upon insipid neutrality. The designs, as shown reduced in an American contemporary, do not, at first sight, appear to yield much inspiration with respect to the problems of town-planning. They look more like designs for church windows and prison doors. This momentary illusion arises from the symmetry of the plans, the lay-out being in almost every instance painfully prim, the houses looking like a regiment of soldiers standing stiffly at attention. If one thought that when town-planning became universal, all the civilised world would look like that, one would rather it never came to pass. But of course town-planning is not going to be merely formal and mechanical, a mere product of set-square and compass. It may degenerate into that if it is not wisely and artistically ordered and influenced. But between stiff formality and chaotic anarchy there is wide scope for artistic amenity. It is mainly with the object of insisting on this point that we have ventured to refer to the otherwise unimportant *ludes* or interludes of the Rhode Island Chapter of the American Institute of Architects.

The Smoke Nuisance. Sir William Richmond treated last week's meeting of the R.I.B.A. to a further racy instalment of his ceaseless diatribe against the smoke nuisance. It is marvellous with how much of freshness he contrives to invest each new variation on an old theme. At the R.I.B.A. meeting he naturally laid stress on the æsthetic aspect of the question. Smoke not merely blackens but corrodes, not only defiles but destroys. It is therefore the arch enemy of the architect, so that Sir William's subject was perfectly relevant to the R.I.B.A. meeting. The existing law against "black smoke" is, it seems, rendered almost inoperative by the very serious difficulty of proving that such a thing as black smoke really exists at all, and the still greater difficulty of proving the blackness in any given case, since "whether or not it looks black depends on the tone and colour of the sky, and on the position in relation to the sun at various times of the day." That culpability or innocence should thus be made to depend on mere appearance is an odd commentary on the wisdom with which our laws are framed. Surely it should not be difficult to prove by some simple scientific test whether or not any particular emanation of smoke is innocent or injurious, without laying undue stress on the elusive question of colour. It is the factories that most arouse Sir William's righteous indignation. When they have been conquered, it will, he thinks, be time enough to turn to the consideration of domestic smoke. He is not relentlessly uncompromising. He thinks the open fire "a grand institution," and waxes poetic in its praise—"There is no goddess of Olympus more snug, more given to good-fellowship, than Hestia," and there are grates and fuel that are virtually smokeless. It was perhaps this admirable touch of human tenderness that won over on the spot so distinguished a recruit as Sir Aston Webb. All things considered, it seems probable that the aid of the Institute in a movement that, influentially supported, may do so much for the health and beauty of our now smoke-infested towns, will not have been invoked in vain.

The Copyright Question. Last week we dealt somewhat tentatively with the problem of architectural copyright. Our attitude on this important question has been rather misconstrued. Because we ventured to foreshadow some of the difficulties that are pretty sure to be raised and emphasized by opponents of the movement, it has been in some quarters inferred that we also oppose it. That conclusion is decidedly a *non-sequitur*. It is certainly not a fair inference from the general tone and trend of our note, in which the desirability of protecting the architect's interests was distinctly affirmed. The denial of his right to property in his own creations is, we are convinced, a great hardship and a crying injustice. We are aware of many specific instances of gross cases of piracy, and we cannot but sympathise with the victims. That a remedy is both desirable and practicable is, we think, shown conclusively in the very terse and temperate statement of the case for copyright which is published in another column of the present issue, and we have reason to hope that the remedy will not be long withheld.

Iona, Exeter, and Cologne. A pamphlet that has just been issued by the trustees of Iona Cathedral records that the choir, south aisle and sacristy, transepts, and tower have been re-roofed, and are now in use for worship. This work has exhausted the funds, and a further appeal is made for contributions to enable the trustees to proceed with the roofing of the nave. Mr. P. Macgregor Chalmers, of Glasgow, has been appointed architect to the trustees, and at his suggestion the plans that he has prepared for the completion of the work have been submitted for consideration to Mr. William Leiper, R.S.A., F.R.I.B.A. In the circumstances, it would be futile to reiterate the protests already lodged against an undertaking that, in our opinion, was unsatisfactory in its inception, and could hardly prove otherwise in its execution. Sir W. B. Richmond, as chairman of a committee appointed by the Society for the Protection of Ancient Buildings to report on Exeter Cathedral, writes a strong remonstrance against the work that is being done to the west front.

In particular, he protests against the renewal of the niche and canopy work, which was "of the finest white stone, admirably sculptured, and with expressions of delicacy and finish that claim for the work the highest place in mediæval craftsmanship," and he complains that "a few weeks ago, when the cathedral was visited again, hardly any of the fourteenth-century canopies were left." Possibly some reply to these strictures will be forthcoming. In the meantime we refrain from comment. With regard to the cathedral of Cologne, it is satisfactory to learn from the report of the surveying architect. that there are no fundamental defects, the "main frame" —an expression that oddly recalls a much more modern type of building—being thoroughly sound and safe. Nevertheless, the necessary repairs required are so extensive that their cost is estimated, with vague vastness, at "many millions of marks." It looks very formidable, even when we remember that a German mark is only of about the value of an English shilling.

L.C.C. School Architecture. The Education Committee of the London County Council have wisely recommended the continuance of the Architect's (Education) Department as a separate entity, instead of putting it under the control of the Council's Superintending Architect. In favour of the latter course it had been argued that thus the Education Committee would be in closer touch with the Building Act Committee; that the Education Committee could work in unison with the other committees; that greater elasticity of staff would be possible, so that the minor officials could be employed on other work when not engaged on that of the Education Committee; and that the assistant architect, being free from such responsibility of administration as would be borne by the superintendent architect, would be able to give more attention to the technical side of the work. The Education Committee, on the other hand, urge that the volume and special character of the work are of sufficient importance to justify the formation of a separate department; that applicants of a better type would apply for an independent post; that an independent chief officer would be able to re-organise his department on his own lines, and to devote "unfettered investigation and study" to the problems of educational architecture; that an architect with the rank of chief officer would carry greater weight in representing the Education Committee when dealing with the Board of Education and other bodies; that such an independent officer, being *ipso facto* an eminent specialist in educational architecture, will be able to impart special training to his subordinate staff; that the superintending architect would be overburdened with work; and that it would be an advantage to have an independent chief educational architect who would be directly responsible to the Education Committee. This is all very good so far as it goes; but the strong insistence on independence seems to be seriously discounted by the last on the long list of arguments. Why not go a step further in the matter of independence, and adopt the more liberal view that the design of County Council schools, primary and secondary, should be thrown open to competition? This policy need not interfere with the appointment of a permanent official. He, however, would have quite enough to do in formulating requirements, and in giving the Council the benefit of his advice as a consultant. In this capacity he would surely earn his "£800 a year, rising by annual increments of £50 to £1,000 a year," without being called upon to design the work. The question of re-organisation having been raised, now is the time to protest against a perpetuation of a system that condemns London to endure the necessary monotony of scores of schools all bearing the impress of one man's mind. They would be wearisome by reiteration if they were as dignified as the Parthenon, or as beautiful as Santa Sophia; being what they are, the London public schools, good as they may be when taken separately, are, in the aggregate, rather too much of a good thing. This is no disparagement to their architect. No man, in the circumstances, could have done better; few could have done so well. But if we are to have variety of elevation, we must have plurality of architects.

A Triple Alliance. Holland County Council wants an architect, surveyor, and estate agent: not three "separate, well-defined, and individual" functionaries, but some Admirable Crichton who, like the hero of the ballad by George Colman the Younger, will be equal to feeling "like three single gentlemen rolled into one." For these are by no means empty titles. The "person appointed" to these high dignities will not merely "be called County Architect, Surveyor, and Estate Agent." He will be It, or Them. He is expected to "discharge all the duties now incident or hereafter to become incident to the Office" —the trinary, triple, or triune Office, that is. He will make plans for all new schools and other buildings required in the County of the Parts of Holland, or for alterations or additions, prepare estimates, draw up specifications and quantities, superintend erection and repairs, and so forth. He will survey and make plans of all the small holdings in the county, and "from time to time visit the same and see that all farm houses, farm buildings, gates, fences, etc., are properly repaired and maintained, the ditches properly cleaned out, and the farms cultivated in accordance with the tenants' agreements." "If so required from time to time, he will inspect all main roads and county bridges, and report to the committee if the same are in proper order and repair." If they are not, will he not report? He will "collect all rents of small holdings or allotments worked by the County Council, and pay the same to the County Treasurer, and pay any outgoings the Small Holdings Committee may require, and be responsible for keeping all registers and books of account in connection with such rents." The salary will be £250 per annum, to include all travelling expenses; inclusiveness of all kinds being apparently a distinctive "note" of the Council of the Parts of Holland. Without suggesting that these Hollanders are guilty of the "fault of the Dutch," which, according to Canning, is "giving too little and asking too much," we cannot away with the unheroic spectacle they conjure up of an "architect" collecting rents and seeing that the ditches are properly cleaned out; and, seeing that the "person appointed," and to "be called County Architect, Surveyor, and Estate Agent," is to discharge duties "hereafter to become incident to the Office," there is no certainty that the Council draws the line at ditches. If time is found to hang heavily on the hands of the "person appointed," it will no doubt be found quite easy to provide him with a variety of other interesting little odd jobs.

SMOKE—THE ENEMY OF BUILDINGS.

By Sir Wm. R. Richmond, K.C.B., R.A., Hon. R.I.B.A.

Brief abstract of a paper read before the Royal Institute of British Architects, May 17th.

Smoke and its products, acids, etc., are detrimental to buildings as well as to all hard or delicate surfaces upon which they are deposited. From the purely æsthetic side of the question there can be no doubt that a deposit of black upon surfaces which are intended by their designers to appear white contradicts the commonsense of all our designs. White shadows and black faces constitute an absurdity even to the tyro, and how much more galling must it be to you when you see your elaborate mouldings and ornaments screaming an ugly lie. It appears to me to be sentimental rubbish which even for one moment defends the colour of that portion of the west front of St. Paul's which has been made a black and unintelligible mass, wholly contradicting Wren's scheme. Gloom is certainly not dignity, nor do dirt and blackness constitute nobility of aspect or add to any historical memories, save those which a firm Legislature ought long ago to have tackled. The black condition of the outside of so many of our public buildings and priceless works of art in architecture is not a thing to be proud of for a moment, but rather to be ashamed of, in that the inertness of public opinion and the insensitive attitude of governing and public bodies which have continued and do continue to delay, not only to legislate firmly, but to see also that their legislation is put in action. Until we have cleaned London from the smoke of factories which do come under the Act, it is useless to attempt to tackle the domestic chimneys.

Remissness of Authorities.

What we have to do is to frame the clause in the Public Health Act in such a way that prosecution is made easy and not difficult, and that could be done by the elimination of the word "black" from the clause, substituting instead "all or any." The London County Council has had this change of wording before it for some little time, accepting a deputation from the Coal Smoke Abatement Society which was listened to with marked attention. I believe that if this Institute would frame and pass a resolution in accordance with the proposed change in the wording of the clause, and send it to the Parliamentary Committee of the L.C.C., the Councillors on that Committee would be strongly influenced to pass the revision of the word in the clause. Continued expression of public opinion, especially that which is in embodiment hammering at it, is the only way to persuade public bodies to act firmly and promptly. The Local Government Board is steadily remiss in sustaining or supporting the execution of Acts of Parliament in their relations to this Act.

Dirt Destructive and Costly.

One is bound to fear that on a question of æsthetics the abolition of smoke would take a long time to effect, but once prove to the purely commercial mind that his pockets are lighter for it and he will immediately change the tone of his argument. The cost in hard cash to every individual in London arising from dirt caused by smoke, and smoke alone, is prodigious; the destruction it evokes is terrible. Even what appear to be hermetically sealed cases do not keep it out. Many a time have I glazed, and as I thought finally pasted-in the glass in a frame, pasted the backing board, and imagined that I had conquered the invasion, when to my disgust, perhaps only a few months after the operation has been completed, I have found the inside of the glass blackened with fine soot powder, and the drawing irreparably damaged. To all pictures soot is a deadly enemy, even when dry, the deposit left by one "black" being an essential oil so powerful in its corrosive elements that a solvent which would remove the stain, however slight, would have to be strong enough to destroy varnish and paint. The fact was told to my father by Faraday during the sitting of a Royal Commission when the removal of the pictures in the National Gallery to South Kensington was in contemplation; I think the Commission sat in 1860, since which time we know that South Kensington is now almost as deeply clouded by dirt and smoke as Trafalgar Square, and there, in South Kensington, are treasures for which the Government has paid hard cash, still unprotected by a little manly legislation, a legislation which would *not* injure but benefit all classes, including the manufacturer-offenders, because all smoke is waste fuel.

One of the greatest fallacies is, surely, that stringent laws concerning cleanliness may damage trades. Dirt obliges extra labour, and extra labour is expensive. The gas companies might suffer, but what are these among so many? One of the ridiculous travesties of commonsense is the fact that the electric light stations in London have been, and some of them are, the chief offenders, creating darkness to produce light! The tram electric stations also are terrible producers of black smoke. From one in this neighbourhood I have seen the smoke travel on the atmosphere for at least a mile. The Local Government Board declines to take action, though by law it is commanded to do so in default of the district authorities. The alteration in the wording of the Act would render it easy for magistrates to convict. Under its present reading it is difficult to prove black smoke to exist at all. Whether or not it looks black depends on the tone and colour of the sky, and on the position in relation to the sun at various times of the day. I do not like to venture to state the numbers of buckets of black water removed from my mosaics and windows in St. Paul's, nor the quantity of black sediment left at the bottom of the pails after the water had lain still awhile; it was astonishing and exasperating. Now, if this smoke is a nuisance—and as to that there can be no doubt whatever, nor that in a large measure it can be removed—it is a national question. It is harmful to every building: stone, marble, iron, steel, copper, bronze, even gold is injured by it. Precious fabrics must be kept under glass, and even then they are not immune from damage; it destroys in time the surface of oil pictures; it has injured and still goes on injuring the precious marbles in the British Museum and South Kensington. The sulphuric acid contained in each smut is a poison of great strength; it will rot copper wire in time; cords, string even of strong hemp, are eaten into, and many are the pictures which have fallen from walls, the accident being due to nothing but the rotting of copper wires or cords through the action upon them of sulphuric acid.

Co-operative Heating.

Before we begin to make an attack on household smoke, let us set the law in motion as it now stands, and use all our endeavours, public and private; yet it will be well to bear in mind that there are grates and there is fuel which are practically smokeless. It is too much to suppose, and undesirable also, to look forward to the German stove heating in our houses—that I, for one, hope will never come. The open fire is a grand institution, and there is no goddess of Olympus more snug, more given to good fellowship than Hestia; still, for general heating of a modern detached house, has the holocaust no recommendations? Gentle diffused warmth reaching, say, from 58 degrees to 60 degrees over the entire house would indeed add to comfort and probably also to health; then the open fire would be just a great luxury, and for it wood might be used in place of coal. I suppose afforestation is a coming thing, anyhow it ought to be; in that case ere long wood should be cheap. And how infinitely more pleasant is the heat it promotes, and absolutely innoxious its gas is as well as its ash, than coal gives off. I wish, and I am by no means alone in wishing, that the poorer classes would combine in tenements, even in streets, and have one cookery place in a given area, and further that all workmen's houses or rows of such were provided with heat as they are now provided with gas or even electric light. All these items in time, if tried now in some district or districts, might become customary. Then we should have begun at the right end for the diminution of smoke from private dwellings. It is no use to legislate till something has been offered equally pleasant with the open fire; but that might come to be regarded as a luxury more than a necessity, if some system of combination or system of general heating were devised and promoted.

I suggest that the Institute should forward a memorandum to the London County Council, praying that in the clause in the Public Health Act of 1891 relating to smoke the work "black" shall be omitted, or, if not, the "black," "and all other smoke," be inserted. This change of a word or short part of a sentence would enable magistrates to know where they are with the law. Plaintiffs would then only have to prove a nuisance, and not have to prove its colour—an almost impossible thing to do.

Photo: Topical.

THE PROGRESS OF THE CAMPANILE OF ST. MARK, VENICE.
This recent photograph shows the present height of the Campanile, and the movable scaffold which is raised as the work proceeds.

Discussion.

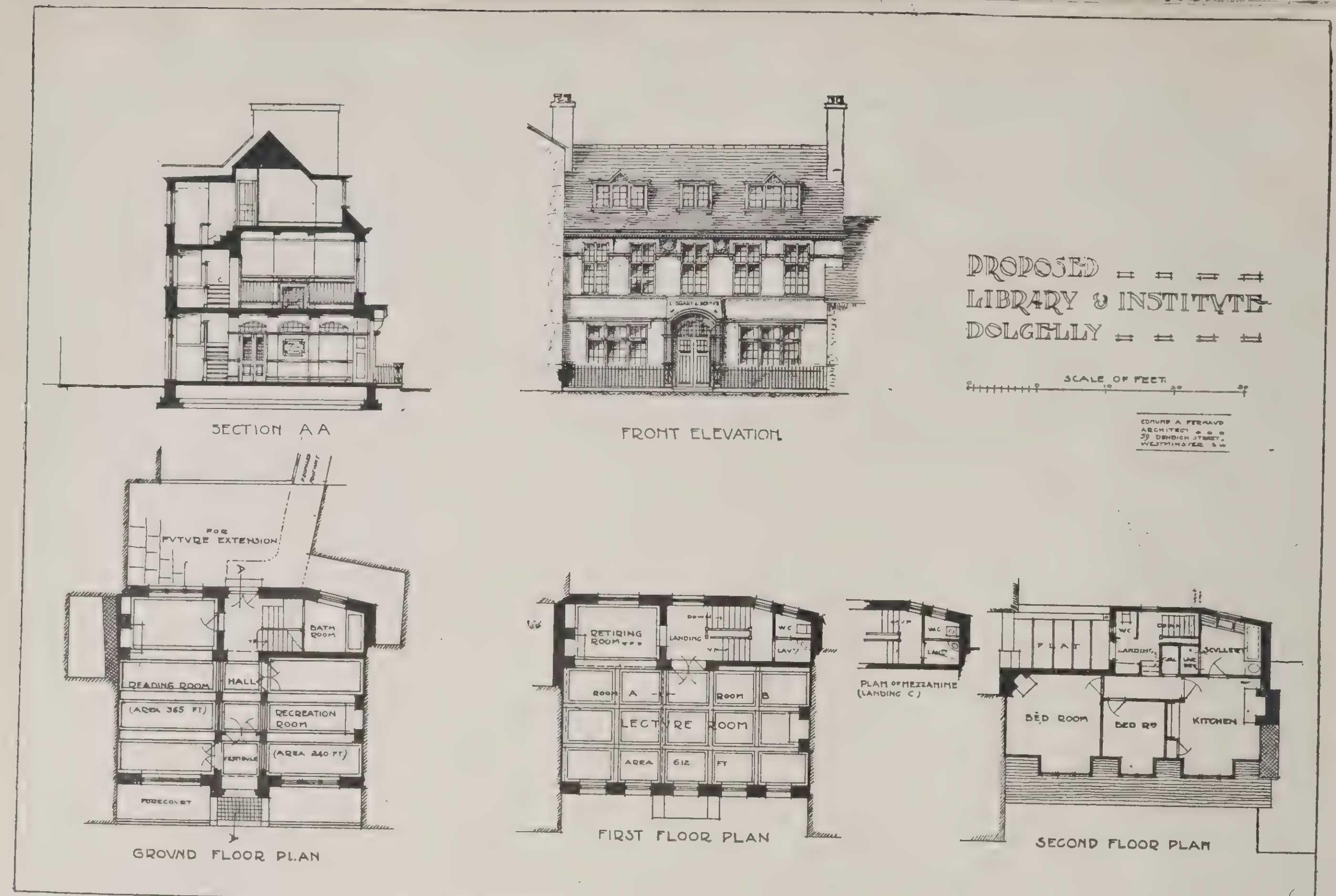
Mr. Des Voeux, in proposing a vote of thanks to Sir William Richmond, observed that the part that the small household chimney played in the smoke nuisance was by no means insignificant, and its importance should not be underrated. Last year—in the middle of June—he had stood upon a housetop in Maida Vale and had had this fact brought forcibly home to him. Stretching away beneath him on into the far distance he saw hundreds of houses, each emitting volumes of grimy smoke. Above, two enormous black clouds were rapidly forming, and when these clouds met, and were joined by the ascending smoke, the familiar London fog was formed. No large factories were in view, there being only the innumerable small chimneys to which he had referred to cause the ensuing fog which had been sufficiently dense to blacken all Westminster. Smoke, too, would travel sometimes thirty or forty miles before dropping. There were, he said, 500,000 gas stoves in daily use in London alone, and he believed the adoption of gas cooking to be the prime factor in solving the smoke problem. If the proposal of Sir William Richmond were adopted, and a letter were sent by the Institute advocating the desired course of action, he believed that the only barrier to a satisfactory arrangement from their point of view would be the L.C.C. Finance Committee, which doubtless would negative the proposal on the ground of expense. If the Institute would only adopt the suggestion he was confident that another step would be taken towards the settlement of a question now in the balance.

Mr. Paul Waterhouse, in seconding the vote of thanks, said that their grateful acknowledgments were due to Sir William for taking such an active part in the movement. It was hardly an artistic subject, and Sir William, occupying as he did such a unique position in the world of art, conferred a great boon upon them by joining in the protest. The utter indifference manifested by the public was doubtless due to the fact that they were a long-suffering race, believing that fogs came as a visitation from heaven. Architects in particular were apt to be too tolerant of the nuisance. Their chief anxiety when designing a building to be erected in London was how it would look when dirty. The usual attitude was that the annoyance was one to be met and not to be removed; but he for one did not belong to this school of thought, and had much pleasure in supporting a motion for delivering a little push to the County Council.

Sir Aston Webb, in supporting the vote of thanks, remarked that he had adopted coal gas for cooking and other purposes in his house after seeing with what success it had been used in the house of Mr. Ernest George. The only drawback, so far as he could see, was that a gas fire refused to be poked. It was his custom at one time to visit a church over whose chancel arch had been placed a very fine fresco. Owing to the accumulation of dirt, it was considered best to remove this fresco and to substitute a mosaic. But the change was of no avail, for the mosaic ultimately arrived at the same condition as its predecessor. He had not taken great interest in the work of the Smoke Abatement Society, but after listening to Sir William's forcible discourse he felt that he must become a member, and add his name to the list of subscribers. The support of such an influential body as the R.I.B.A. was bound to have good effect on the movement.

Mr. Ernest George remarked that many advantages could be claimed for the use of coal gas for heating and cooking. It was, in particular, a great convenience to be able to turn it on and off at will, and it was virtually sootless.

Sir William Richmond, in reply, observed that the co-operation of the Institute was greatly to be desired. They would be amazed if they knew the number of anonymous letters he had received as the result of his strenuous warfare against smoke, some even threatening his life. With regard to the smoke nuisance, Paris was in a plight very similar to that of London. Venice, also, was



PROPOSED LIBRARY AND INSTITUTE, DOLGELLY.

This design was selected in competition some time ago. The problem to be solved was to design a building suitable to its requirements for a very limited amount of money. Local rubble is used for the walling which is finished externally in cement. The roof is covered with green local slates. The stairs are in teak, and the rooms on ground floor have wood-block flooring. The hall is tiled. The lecture room, with retiring room, can be divided into two large rooms by means of folding partitions. The building is set back owing to street improvements. The architect is Mr. Edmund A. Fermaud, of 59, Denbigh Street, Westminster, S.W.

in a lamentable condition; and, while there, he had had the honour of dining with the King of Italy, who had asked him to write a letter to the press protesting against the general feeling of apathy. This he had done, but he knew not its effect. Cairo, and also Japan, were suffering from the dread invasion. Smoke abatement, therefore, was by no means a purely English question, but was of universal incidence.

CHURCH BUILDING ETHICS AND ÆSTHETICS.

By Edward Warren, F.S.A.

Abstract of an address delivered by Mr. Edward Warren, F.S.A., at the Annual Court of the Incorporated Church Building Society, May 21st.

Honest Soundness of Structure.

Amongst the very large number of plans representing schemes for new churches, or the enlargement or alteration of existing ones, old or modern, the percentage which we find it possible (always to our very great pleasure) to approve absolutely, is small, but I think I may fairly say that we do find an increasing tendency to accept and obey the main constructional requirements of our society, and to endorse the spirit as well as the letter of those instructions. The number, however, is still large, which is sent to us, showing not only ignorance of the society's requirements, but of the ordinary practical needs of a church and a sad lack of perception of the befitting attributes in honest soundness of structure, simple excellence of materials, and quiet dignity of effect.

A Misguided Desire to Smarten.

It is frequently painful to us [the society's Honorary Consultative Committee of Architects] to have to consider schemes for the building of churches, whose submission to our judgment is in itself a proof of slender financial resources, which seem to aim rather at a certain Cockney splendour than at the sober and restrained adequacy which is barely attainable within the limits of the possible expenditure. It is, perhaps, more than ever painful to minds trained in the study and love of ancient architecture, and attuned to its serene sincerities, to have to sit in judgment upon plans, generally well meant, which nevertheless portend the woeful mishandling of some quiet, delightful old country church, to which time and weather have imparted an irreplaceable beauty, and in which the direct and simple alterations and naive additions of successive generations have furnished to all who can read them, instructive pages in the history of our church and our country. There is often, alas! evidence of a misguided desire to smarten, to Cockneyfy, or, if I may use the expression, to "suburbanise" the old grey churches of our quiet country-sides, by the ruthless application of smart and imitative workmanship, in cheap materials, for the sober and humble old fittings and furnishings of our simple-minded predecessors. It is bad enough that a brand-new building dedicated to the worship of God should present the thin, hard lines, the cheap symbolism, the thoughtless, joyless travesties of ancient and beautiful things, but it is worse —indeed, to many of us it is heartrending— to witness the perversion of a quiet and lovable old church to the common standard of modern ecclesiastical smartness.

Essentials of Right Building.

The brand-new must be brand-new, of course, and there is nothing wrong about newness. It has, indeed, a distinctive charm of its own; and when a new building is thoughtfully and skilfully planned, proportionate, dignified, substantial, and strong, it is a thing to be glad of, wholesome all round, the honest outcome of an honest purpose. But where, as is often the case, it is necessary to add to an ancient church—a thing which, I believe you will agree with me, should only be done under the stress of sheer necessity—I feel that the inevitable newness of the addition requires, in order to do no hurt to the old structure, more care and thought, perhaps more skill than unhampered new building on a new site, and I think it is generally only in simple directness of purpose and frank declaration of the addition as such, in the use of materials of local origin where possible, or at any rate of kindred nature and assimilable in time to those of the old building, as well as in avoidance of sham antiquation or mere detail-copying of the original building, that harm is avoidable. See that your walls are comfortably thick, a little over the minimum requirements of this society wherever possible, that your piers and arches are strong and simple, and that your roof-timbers and roof-covering are substantial and sound. Forego all adornment, leave tracery out of windows, have chairs instead of pews, avoid all cusping and crocketing, carving, or ornament of any kind, but have the building sound and solid, and, above all, seek sincerity of structure rather than ingenuity. Such would be my exhortation to clergy and architects alike.

The Dignity of Space.

In new churches in most cases submitted to us the elimination of mere ornament would usually make possible better, thicker-walled, and more substantial buildings, and aften the provision of more ample space. I am struck by the, as I think, extremely regrettable tendency so generally displayed to fit a church closely to the mere seating accommodation demanded by local conditions, allowing for unseated floor spaces the merest exiguity of passage-ways. This is very different on the Continent, where a much greater sense of the dignity of space appears

to obtain in the planning of churches. There is sheer satisfaction to the eyes and, indeed, actual beauty in the proportionate distribution of enclosed space, and, while perhaps it may not be possible for us to increase our minimum requirements in that direction, I suggest that we might accompany their statement in our rules by a suggestion as to the extreme desirability of more ample spaces.

For Beauty and Fitness of Design.

In conclusion—and I believe that on this head I may safely speak for the Committee of Consulting Architects of this Society—I feel that our work would be more useful, and the influence of this society upon ecclesiastical architecture greatly strengthened and improved, if more power and wider discretion were given us in recommending for grants, in respect to the architectural character of designs submitted to us as well as in regard to mere structural sufficiency. Might it not, for instance, be possible to have recognised classes or categories to which, in our criticisms, we could assign the various plans in accordance with their general merits, and which might influence the Executive Committee in its decision as to grants? We should like to be able to feel that our grants conveyed æsthetic as well as merely practical approval, and that, if possible, a sort of bonus were bestowed upon unusually excellent and harmonious designs. If it is not possible, in view of our unfortunately narrow financial limitations, to make an increased money award to architectural excellence, we might at least devise some system of "starring," so to speak, designs especially approved by the honorary consulting architects. In this way it would soon get to be felt that where the plans for a new church, or for an addition were starred by the Incorporated Church Building Society, the promoters would have leverage for an especial appeal, the value of our grant would be morally increased, a deserving architect would receive express recognition, and your consulting architects would have the gratification of conveying especial approval and of feeling that the society was doing its best to secure beauty and fitness of design as well as soundness of structure and convenience of plan. It is generally admitted that a marked and most hopeful advance has been made within the last few years in secular building, but, as my colleague Mr. Prior so ably pointed out to you when addressing the annual general court a year or two ago, the building of churches has scarcely shown corresponding advance—a sad admission, as we shall all feel.

The Need for Dignified and Beautiful Churches.

Time was when the church was the high centre of all artistic activities, the inspiring source of artistry in every craft. Time was when her buildings were the supreme emotional expression of the creative fervour of the land. We can hardly hope, I fear in this age, when the building instinct inherent in man is dulled by the myriad competing interests of our complex life, to restore that state of things, but we can, and this society more potently perhaps than any other organisation, bear our testimony to the need for dignity and beauty in the buildings of the Church, which is especially great in these days amidst the mean and sordid surroundings of industrial neighbourhoods where, if anywhere, an approach to ideals of beauty, an oasis of refreshment to tired minds and monotonous lives, should be found in the parish church.

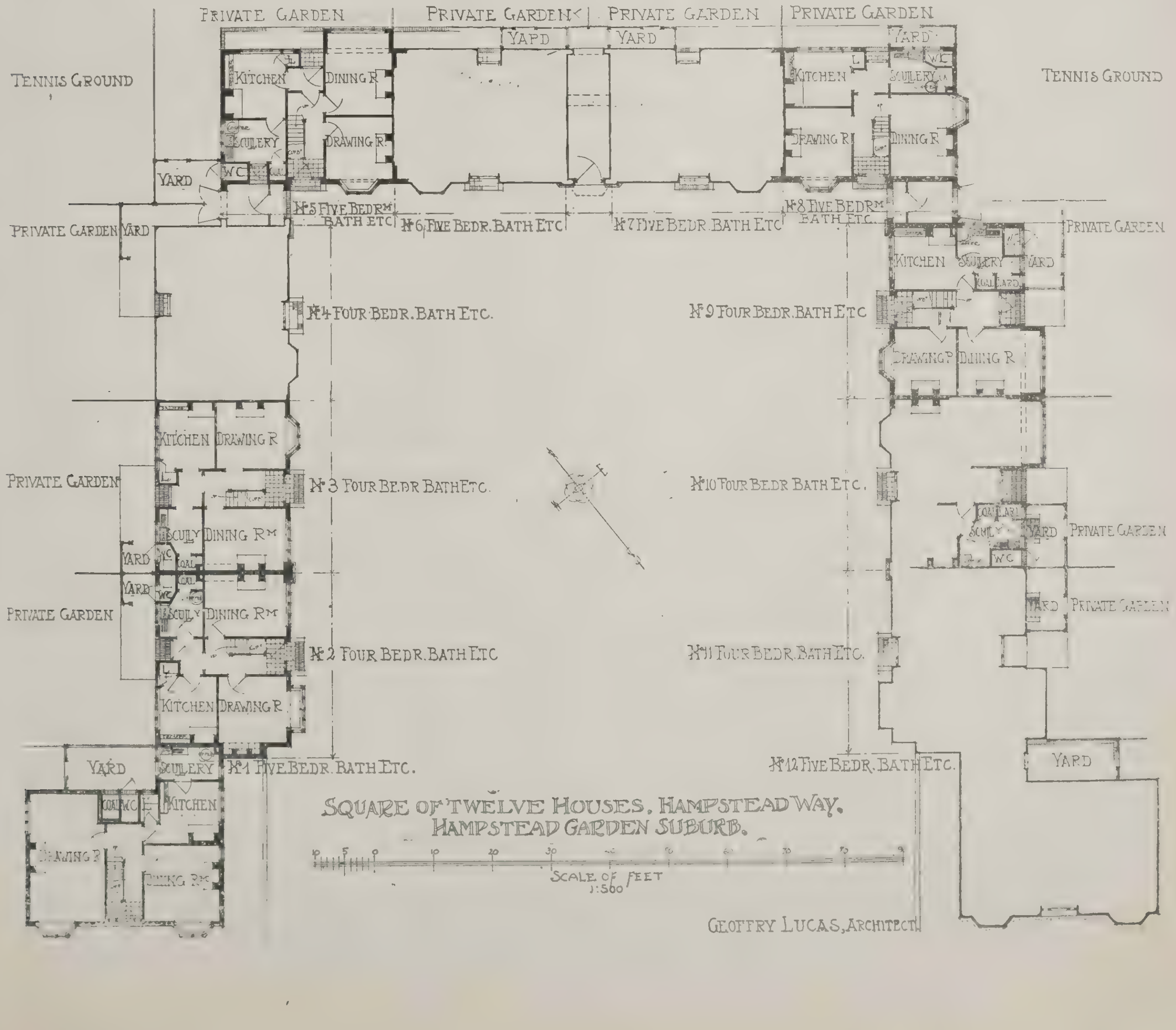
Our Plate.

The twelve houses shown in our plate have been built to form a square in Hampstead Way, Hampstead Garden Suburb, N. The accommodation in each house consists of two sitting rooms and offices on the ground floor; on the first floor six of the houses have five bedrooms, and six four bedrooms, together with bathrooms, etc. The materials used are unpicked red Osta bricks, red roofing tiles, and rough-cast finished to a cream tint, while the woodwork is broken white with green doors. There is a common garden, arranged on simple formal lines with summer-house and sundial in the square, while each house has its private garden at the back, and also has the use of a tennis court on a portion of the property. The houses were built by Messrs. W. Moss and Son, Ltd., of Loughborough and Hampstead, as a private venture, and are for sale. The architect was Mr. Geoffry Lucas, A.R.I.B.A., of 14, Hart Street, W.C., and Hitchin, Herts.

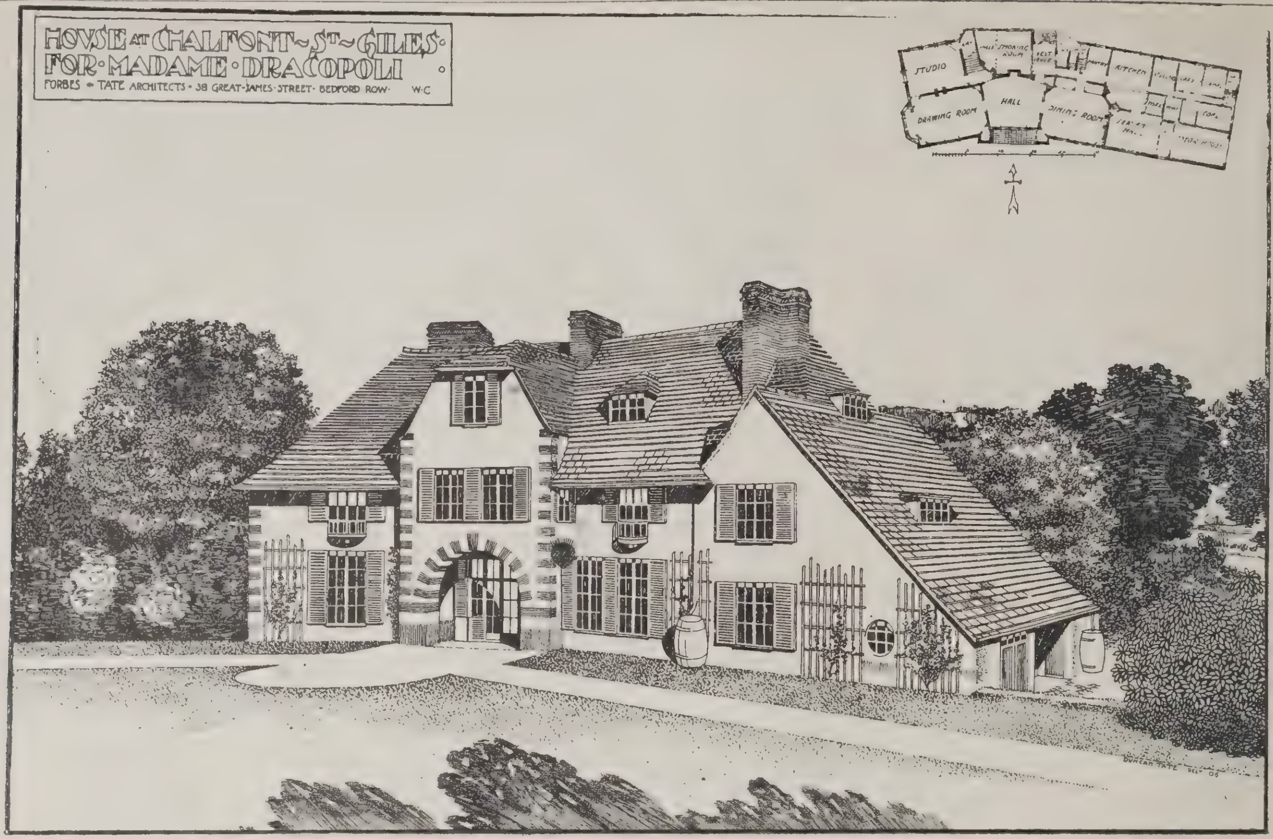
THE CASE FOR ARCHITECTURAL COPYRIGHT

The advocates of architectural copyright maintain that the demand is based on (1) reason and equity; (2) on the general wish of architects of all nations; (3) on the necessity in this country as shown by the abuses to which absence of such protection gives rise; and (4) demonstrable proof of the practicability of giving effect to legislative enactment on the subject.

(1) Without question, architecture is a fine art, and original conceptions in it should be accorded the same protection as those in the other fine arts. The architect, like the sculp-



SQUARE OF TWELVE HOUSES, HAMPSTEAD WAY, HAMPSTEAD GARDEN SUBURB.


HOUSE AT CHALFONT~ST~GILES·
FOR·MADAME·DRACOPOLI
FORBES & TATE ARCHITECTS · 38 GREAT·JAMES·STREET· BEDFORD ROW· W·C
STUDIO
SMOKING ROOM
KITCHEN
HALL
DRAWING ROOM
DINING ROOM
COAL

This house, erected about two years ago, has numerous additions and improvements not shown in the drawing; among the additions to the scheme are a forecourt, a sunk kitchen yard, and stables and yard. Old materials have been used for the roofing and for the brickwork where showing. The house has thirteen bedrooms.

tor, may reasonably demand protection for the creations of his mind and art, "intellectual property" which, in justice, should be inalienable. It is surely not right that his original work should with impunity be reproduced by others for their own benefit.

(2) The International Congress of Architects, at Paris, in 1878, passed unanimously a resolution demanding protection for works of architecture: and the resolution has been reaffirmed by subsequent conferences at Paris (1878, 1889, and 1900), Brussels (1897), Madrid (1904), London (1906), and Vienna (1908); and similar resolutions have been passed at Congresses of the International Association of Art and Letters held at Paris, Madrid, Neuchâtel, Milan, Barcelona, Antwerp, Berne, Turin, Liège, Mayence, and in other places; and the architects of France, Germany, Holland, Belgium, Spain, Italy, Denmark, and Sweden, have petitioned their respective Governments for recognition of architectural copyright.

(3) The anomalous position of the architect with respect to his creations was brought into strong relief by the decision in *Gibbon* v. *Pease,* which was tried in King's Bench Division before Mr. Justice Ridley on November 15th, 1904. In this case the plaintiff claimed the delivery of contract drawings and specifications from the defendant, whom plaintiff had employed as architect of the work to which the drawings applied. For the plaintiff it was contended that he as building owner was entitled to possession of the drawings he had employed defendant to make for him, such drawings being made part of the contract. For the defence it was contended that the purpose of the drawings was to enable the architect to see that the buildings were constructed in accordance with the approved design, and evidence was offered in proof of the custom that the drawings and specifications were the property of the architect. This evidence was not admitted, his lordship holding, in accordance with the precedent in *Ebdy* v. *McGowan,* that, failing an express contract to the contrary, the drawings belonged to the employer. This decision was upheld on appeal, March 24th, 1905. Hence anyone who commissions an architect to make drawings may claim possession of them as his own property, and may make any use he likes of them. That many persons are taking full advantage of this position there is abundant evidence. In particular, designs for cottages and villas have been reproduced wholesale, without the consent of the designer; and the close copying of the plans, elevations, and details of much larger buildings is not unknown. The claim for relief from this injustice is merely right and reasonable. There appears to be no essential difference between the procedure of the sculptor, whose work is protected, and that of the architect, whose work is unprotected. The sculptor, like the architect, designs work of which the manual execution is largely delegated. This is of necessity the case. The sculptor cannot be expected, for instance, to cast his own bronze. Neither can the architect be expected to dig his own foundations or tile his own roofs. But in neither case does the delegation of such labour vitiate the claim to authorship, and it can therefore be justly claimed that the architect, like the sculptor, is entitled to protection for work of which the inception is his. In each case it is the work of the brain, not the work of the hands, for which protection is sought. In the one case it is justly given, in the other case it is unjustly withheld.

(4) It is not apprehended that there would be any greater practical difficulty in affording protection to architecture than has arisen with respect to sculpture. A carefully drafted Bill, while affording due protection against flagrant acts of piracy, could not seriously embarrass *bona-fide* designers of buildings. As to the question of penalty, precedents occur with respect to infringement of rights of light, etc., in which injunction, damages, or demolition may be adjudicated; but such heavy penalties would hardly be inflicted except where the piracy was shown to be detailed, wilful, and deliberate. It is believed that no difficulty is experienced in administering the law as to architectural copyright in France and Belgium. In the former country the principle is of old standing, an architect having claimed and received protection in 1855; while architects and sculptors were, in the law of March 11th, 1902, specificially benefiting by the artistic copyright law of 1793.

It is believed, therefore, that all that is needed in order to secure an Act establishing architectural copyright in this country also is a clear representation of the injustice under which architects are labouring in this respect, and an influential demand that the injustice shall be removed by legislative enactment.

THE INSTITUTE MEMBERS' CLUB.

The monthly meeting of the above will be held in the smoking-room of the R.I.B.A. on Thursday next, 27th May, 1909, at 6 o'clock p.m.—K. GAMMELL, Hon. Sec.

Messrs. Cecil R. Pincent, A.R.I.B.A., and Hugh Townshend Morgan have removed from 29, Great George Street, to 37, Berners Street, W.

* * *

Mr. W. A. Forsyth, F.R.I.B.A., and Mr. H. P. G. Maule, F.R.I.B.A., have removed from 16, Great Marlborough Street, to 309, Oxford Street, W. (near Hanover Square). Telephone 3623 P. O. Mayfair.

* * *

The condition of Cologne Cathedral is reported by its surveying architect as being in many respects exceedingly unsatisfactory. The main fabric is "thoroughly sound," but the repairs required are estimated to cost many millions of marks.

* * *

Mr. Edward Good, of Riseholme, Yorks, who has died after a somewhat protracted period of declining health, was formerly a member of the firm of Edward Good and Sons, contractors, Hull, and had been president of the Hull Master Builders' Association and also of the Yorkshire Federation. His funeral was attended by officers of those associations.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
June 1	MOLESEY ISOLATION HOSPITAL. The East and West Molesey U.D. Council invite competitive plans, with specifications for the above. Full particulars can be seen at the Council Offices, Dundee Villa, East Molesey.
June 4	COTTAGE HOSPITAL, BODMIN. Architects are invited to submit competitive designs for the above, to be erected at an approximate cost of £2,000. Premiums, £12 12s., £8 8s., and £5 5s., for the three sets of plans *which the Committee may select.* Premiums of selected Architects to merge in Commission. Site can be seen on application to Henry D. Foster, Hon. Secretary to the East Cornwall Hospital, Bodmin, from whom particulars are to be obtained.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading. Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second, and third respectively.
June 24	NEW PUBLIC BUILDINGS, BURSLEM. The Architect whose design is placed first by the Assessor will be appointed to carry out the work. Premiums of £100 and £75 to authors of second and third designs, respectively, Conditions and plan of site from F. Bettany, Borough Surveyor. Deposit, £2 2s., returnable on receipt of *bona fide* design.
July 9	STOKE-UPON-TRENT. Additions to Town Hall including large hall to seat 3,000 people, police court, etc. Premiums of £100 and £50 for second and third designs respectively. Assessor nominated by Pres. R.I.B.A. Conditions and particulars from Jno. B. Ashwell, Town Clerk, Town Hall, Stoke-on-Trent,
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	WALLASEY U.D. COUNCIL. CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £1, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

New Library, Middlesbrough.

Mr. J. S. Gibson, vice-president R.I.B.A., the assessor in this competition, has made his award as follows:—1, Messrs. Russell and Cooper, FF.R.I.B.A., 11, Gray's Inn Square, London; 2, Mr. G. H. Wenyon, M.S.A., 194, Wolverhampton Street, Dudley, and Chas. H. Potter, 20, Cross Street, Manchester, joint architects; 3, Messrs. Cooper and Slater, 13, Richmond Terrace, Blackburn. The exhibition of the designs in the Town Hall Crypt, Middlesbrough, closes to-night, at 8 p.m.

Rhos-on-Sea Congregational Church.

Mr. John B. Gass, A.R.I.B.A., of Messrs. Bradshaw and Gass, the assessor for the above competition, has awarded the first place to Messrs. J. M. Porter and Elcock, of Colwyn Bay; Mr. Arthur Hewitt, Llandudno, receiving the premium of £10 awarded for second place.

Correspondence.

Bridges of Reinforced Concrete.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—Probably many of your readers will be interested in the remarkable test to destruction of the bridge built for the Dusseldorf Exhibition. The test was carried out in the presence of a large assemblage of German engineers and others, who were eager to view the experiment on an actual traffic bridge that had been in daily use since 1902, and was to be destroyed on account of town alterations demanding its removal.

The bridge had a clear span of 30 metres (say, about 98½ft.), a breadth of about 9.14 metres (31ft. roughly), and a central height of only 2 metres (6½ft.). Thus the ratio of rise to span was 1-15th (really 1-14th), or otherwise an extremely flat arch, which was hinged with granite pivot blocks at centre and springings. The arch ring thickness was, at centre, 25ins.; at springings, 27½ ins.; at the haunches, 33.46 ins. The foundations construction was difficult, being through made up soil, and thus the foundation bed was 5 metres (16.40ft.) below ground level at the lowest point. The arch ring mixture was 1.4.4., whilst against the exterior granite hinge faces a special "fat" mixture of 1.3.3 (fine stone) was placed to "cushion" the pressures as transmitted from concrete to granite, and *vice versa* at the centre. The hinge joints were covered with zinc sliding plates and asphalt sheeting. A load test over the arch of a 27 metric-ton steam-roller and a live load of 450 kgs. per q.m. (per sq. metre) was distributed to give greatest stresses in the arch ring; with resultant central deflection of 1,235 millimetres and a horizontal "push-out" or outward displacement of only 0.6775 millimetres. Other measurements were taken along the arch ring with great care. The architectural features were obtained by two coloured facing mixtures, and the embellishments were executed in artificial stone, finished in situ with mason dressing. The bridge was designed and carried out by the Herrn Dyckeroff and Widmann, of Biebrich-am-Rhein.

The loading was placed so as to induce the most dangerous stresses in the arch ring. After certain recorded loads had been placed on the "ring," the loading, having been steadily increased till at 225 tons (metric) the first crack appeared (this was early on the second morning), was continued from 7 o'clock in the morning till 6 o'clock in the evening, by which time the load on the ring was 325 tons (metric), with the bridge still intact.

In the course of a few weeks the actual downfall was only made possible by the application of strong explosives, and even then was difficult, thus proving convincingly the enormous resisting capacity of "proper" concrete when mixed in the truly conscientious manner typical of the German practice. "Hinge blocks," it may be mentioned, are also made of artificial stone (cement concrete with fine aggregates), and as a typical example I should like to cite those that were used in the Lenne bridge, by Halden (a street bridge). The stones (hinge) were cast in hard plaster forms, accurately gauged to the varying radii, and the mixture (machine mixed) was 1.2.2., and they were "seasoned" about 100 days old before using. To eliminate possible inaccuracies of the hinge surfaces, there was also placed between the contact faces a 2 mm. lead sheet sandwiched between two .08 mm. brass sheets to reduce or diminish the friction. The radii of the central hinge faces was two metres or 200 centimetres and 313 centimetres respectively, and, as usual, they were jacked or pressed together to attain thorough uniform contact before the last sections were concreted in. The latest practice since the accident to the Maximilian Bridge, where one of the steel hinge faces slid from its opposite bearing bed, and had to be jacked back, is to safeguard the hinge joint by means of short iron or steel dowel pins, and this method is used, for example, in the well-known Isar bridge at Grunwald. It seems that the springing hinges can be placed more towards the centre with advantage, thus lessening the theoretical span. Among the many notable three-hinged arched constructions, the Germans regard with great pride the wonderful Steyr river bridge, which has a ratio of rise to span of only 1-16th, with, of course, a considerable ever-present pressure on the abutments. This is a pin hinge type, with 18 hinges connecting six rows of the usual lattice reinforcement peculiar to the Melan system.

JAMES A. SMYTH.

The Taxation of Land Values.

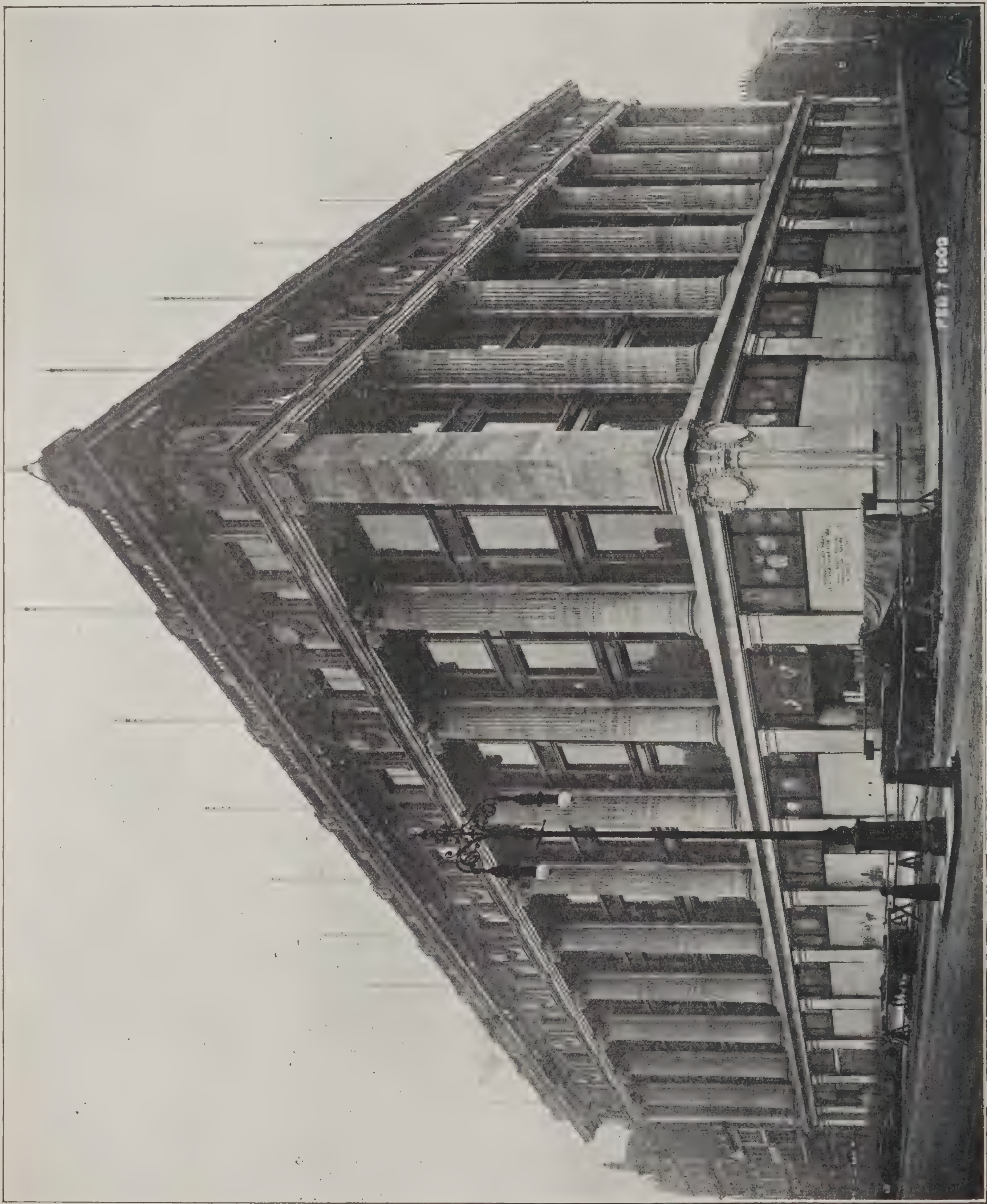
"An Onlooker" draws our attention to the last sentences of his letter which appeared in our issue of the 19th instant, which, he says, are not quite clear, and should read: "The taxation of land values" is the shibboleth of a cult or religion with the belief that this nostrum would reduce the income tax to nothing, relieve all buildings of rates, turn towns into gardens, and marshes and wastes into fertile fields. There is nothing like a little practical experimenting to knock holes in fallacies based on theory.

With respect to the taxation of land values, we have received from the British Constitution Association, 23, Charing Cross, S.W., a circular in which are printed the terms of the resolutions that have been passed in opposition to the Budget proposals. The first resolution is in general terms; in the second it is especially proposed that a committee shall be appointed to present a memorial urging the Government to withdraw the land-taxation proposals, such committee to consist of one representative from the Surveyors' Institute, the Society of Architects, the Estate Agents' Institute, etc. All professional, trade, or other organisations are invited to appoint four representatives to attend the adjourned meeting of the Conference, which will be held to consider the reply of the Government to the memorial.

[*Editorial Note.*—We are somewhat surprised that we have not received more letters on a subject that is fraught with such great possibilities, either for good or evil, to the building trade in general. By those who favour this form of taxation it is asserted that the imposition will tend to greater prosperity in the building trade; but builders appear to be equally divided in opinion on the matter. Those correspondents who were so anxious, a few months ago, for us to open our columns for letters on the subject, have not, so far, responded to the opportunity now afforded to them.]

THE SELFRIDGE STORE, OXFORD STREET.

This fine new building, of which a general view appears on the next page, and of which some further constructional details are given in this issue, is a drapery and dry goods store situated on a site of about one acre on the north side of Oxford Street, midway between Bond Street and the Marble Arch. It has frontages to Oxford Street, Duke Street, and Somerset Street, the first-named being about 215ft. long. There are three basements, the lowest one being used for heating, electric light, artesian well, motor rooms, etc. The sub-basement is occupied by stockrooms for the various departments, and the first basement is partly used for sale purposes, and partly for despatch and staff accommodation. The ground, first, second,



THE SELFRIDGE STORE, LONDON. A BUILDING THAT HAS SET A NEW SCALE IN OXFORD STREET. R. FRANK ATKINSON, F.R.I.B.A., ARCHITECT.

and third floors, are all sale rooms for various departments of the business. On the third floor will also be found the reception rooms, national rooms, post office, rail and steamship ticket office, and theatrical booking office, etc. The fourth floor is used throughout as a restaurant with kitchen, offices, smoke-room, etc., and a spacious roof garden is provided with access from the restaurant. There are nine passenger and two goods lifts, electrically worked, and a gravity package conveyor from the upper floors to the despatch room in the basement. There are also six staircases, comprising 4,000ft. of reinforced concrete staircase, 3,000ft. of landings, and 2,000 moulded beams and stringers, designed and erected by Henry Johnson and Sons. The building has taken about twelve months to complete, and has required in its construction about 3½ million bricks, 45,000 cub. ft. of Portland stone, 3,000 tons of steel, and 25,000 yards of concrete floors. The general contractors were Waring and White, Ltd., and the architect is Mr. R. Frank Atkinson, F.R.I.B.A.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable: and it must be understood that both question and reply will, as a rule, be published in these columns.

Books on Steel Towers.

DEVONPORT.—STOKE writes: "Will you kindly give me particulars of a book on stresses in steel towers such as water towers, etc.?"

There are very few books known to the writer which deal in particular with the stresses in steel towers. "Towers and Tanks for Waterworks," by J. N. Hazlehurst (Wiley and Sons, New York, or Chapman and Hall, Ltd., London, 10s. 6d. nett), will probably give the information desired. A.

French Polishing.

WOODSIDE.—R.A.B. writes: "I want to do some French polishing, and should feel obliged if you would give me some information on the subject."

It would take at least three of our pages to describe the process at such length as to be of practical service to you. There are several good practical books from which you can get full directions, for example, "French Polishing" (Cassell), 6d.; also a book of the same title published by Crosby Lockwood, at 1s. 6d., and another by the same firm, entitled, "A Practical Guide to French Polishing," at 2s. 6d. J.

Assignment of Property.

WALES. W. H. S.—In answer to your questions I regret that I cannot understand this query. Was the first-mentioned assignment by way of a lease or a conveyance of the freehold? Was it executed by the first mortgagee? What is the compensation for? Is it an awarded amount for damage done to the assigned part of the property, or is it merely by way of rent under a lease? What do you mean by the "estate agent"? Is he a receiver of rents and profits employed by the house-owner? I may say that unless the mortgagees are in possession, they can claim no part of the annual rentals of the premises, and the second mortgagee only comes in after the first one is satisfied. If you can clearly state the case, I will endeavour to answer your questions, but I can now only advise the estate agent to hold the money until some one of the claimants proves his right to it by legal action. F.S.I.

An Analysis to Find CO_2.

LONDON, S.E.—A. E. B. writes: "What is the best method of ascertaining the amount of carbon dioxide in the atmosphere? Is Pettenkofer's the best?"

Pettenkofer's method is not usual with chemists, and is seldom taught by them. In fact, the chemistry professor at each university has his own way, and the way to choose is that which you can do most easily and accurately. Any method requires some skill in the use of chemical appliances; and this is best acquired in the laboratory of a technical school. As the present sessions are virtually at an end, you may obtain help from a chemical or photographic friend. These two methods will perhaps meet your needs:—(1) Slowly force (by means of water) the sample air from its bottle (of known volume) through a series of U tubes containing caustic potash—the increase in weight of the tubes when all the sample air has been forced through them is the weight of carbon dioxide in the sample. CO_2 is twenty-two times the weight of hydrogen (the lightest element and the standard unit); oxygen is sixteen times the weight. For most accuracy the air should be dried by passing it through two U tubes that contain strong sulphuric acid, at the beginning of the caustic potash series, and through another two at the end. The latter two must be weighed with caustic potash tubes, as any water they contain will have to come out of those. (2) Take the samples in flasks containing when corked 400 cubic centimetres; into these pour 20 cubic centimetres of saturated lime-water; cork up again, and then shake furiously until the lime-water becomes turbid—you may have to shake the flask for ten minutes. The time needed to turn the lime-water turbid is a measure together with the amount of turbidness of the quantity of CO_2 in the sample. The chemical equation is

$$C_a\ O_2\ H_2 + CO_2 = C_a\ CO_3 + H_2O.$$

The water in the lime-water takes no part in the action, although it occupies space in the bottle, and for this reason the amount of CO_2 in the sample cannot be found by this method, which is only a quick way of learning whether there be an excess of CO_2 in the air. Saturated lime-water does not become turbid until it has absorbed 1-84th of its bulk of CO_2; and with the sizes of flask and dose recommended the quantity of CO_2 in the air sample is about 0.006, or 0.002 parts in excess. INGENIOR.

Green Paints Fading.

WANDSWORTH.—R. A. asks: "Does green paint fade or perish quicker at the seaside than in town; and if so, is there anything that can be added to the colour to give it greater permanency?"

Sea air is very destructive to most paints, and certain greens, such as Brunswick, fade under the most favourable circumstances, and would be likely to "fly" quicker when at the seaside than elsewhere. Nothing can be added to the colour to prevent this, although a coat of varnish over the paint will assist materially; but this is expensive for ordinary work. As noted in these columns recently, permanent greens may be purchased at a slightly increased cost, and in the case under notice these should be used. Messrs. Mander Bros., of Wolverhampton, make a beautiful series of permanent pigments, named "Suffield greens." Messrs. W. R. Todd and Son, of Hull, have recently brought out a new permanent green of brilliant hue; and Messrs. Thos. Fewster and Sons, Hull, have a good colour called "Holly green." Try these, but do not mix with white lead; choose the particular tint which satisfies your requirement. There are scores of them, and every big colour manufacturer makes many. Pay a good price for a first-class permanent green, and you will find there will be no fading, even when the colours are exposed to sea air. Should it be necessary to lighten a green, use zinc oxide. J.

Continuing Offence.

BIRKENHEAD.—W. G. writes: "What is a continuing offence? A is fined by the justices for (1) erecting a building without notice or plan, (2) erecting a building not built of brick, etc., (3) encroaching on air space in rear. The town clerk afterwards sends a threatening letter to B, stating that 'unless the buildings are removed within fourteen days proceedings will be instituted against yourself in respect of the continuing offence of allowing the buildings to remain erected contrary to the by-laws.' Is this a continuing offence?"

A "continuing offence" is one which cannot be purged by the mere payment of a fine or other penalty inflicted upon conviction before a court. The cause of the offence must be removed, or it will continue legally to be an offence, and further penalties can be enforced. If you refer to your copy of the local by-laws, you will probably find it stated (near the end) that for a continuing offence "every person who shall offend" (not in this case "every person who shall erect") shall be liable to a penalty of one pound per day; and you will no doubt further find that power is also taken by which buildings erected contrary to the by-laws may be summarily removed. I am of opinion that unless the retention of these buildings is of vital importance to B's property, it would be cheaper to remove them than to risk the result of legal proceedings. It is quite possible that the transference of the owner's interest in the property from A to B may protect B (see the case "Corporation of Blackpool v. Johnson," in the King's Bench, March 26th, 1902); but a great deal depends on B's ignorance of the proceedings against A, and the date when those proceedings were instituted, and I much doubt if the "game is worth the candle." F.S.I.

Rights of Adjoining Owner.

NORFOLK.—S. writes: "The accompanying rough sketch [not reproduced] shows adjoining properties, in one of which a shop-front has been fitted. The owner of the other now asks for compensation. The plans were passed by the rural district council."

The adjoining owner has no right whatever to any money compensation in such a case. If, however, your lease forbids the erection of a shop or lays down a "building line" which you have violated by your projecting windows, he may apply to the freeholder, asking that you should be compelled to comply with the conditions of your lease. So far as the rural district council is concerned, the matter is ended. B should have complained to them before the plans were approved. In any case, he does not appear to have suffered any appreciable damage.

Joists to Carry Angle Bay and Turret.

PRESTON.—F. C. G. writes: "Enclosed I send rough tracings of proposed stone corbelling for a bay window and turret at the angle of a building, and I should be obliged if you could give me some advice as to the best manner of coursing and jointing, and the size of stones to make a sound job. Will it be necessary to cramp and dowel the joints or to anchor the bottom stones down with iron straps, considering the splayed brickwork does not go above 2nd floor level? I have indicated in blue dotted lines rolled steel joists, which may be built into brickwork and assist the carrying of the angles of brickwork. Will this be necessary to form tie and cantilever?"

The section of bay is shown in Fig. 1, plan on first floor in Fig. 2, and plan on second floor in Fig. 3. The load on each of the two top joists will be approximately 3.25 tons, and assuming that two-thirds of this will be sup-

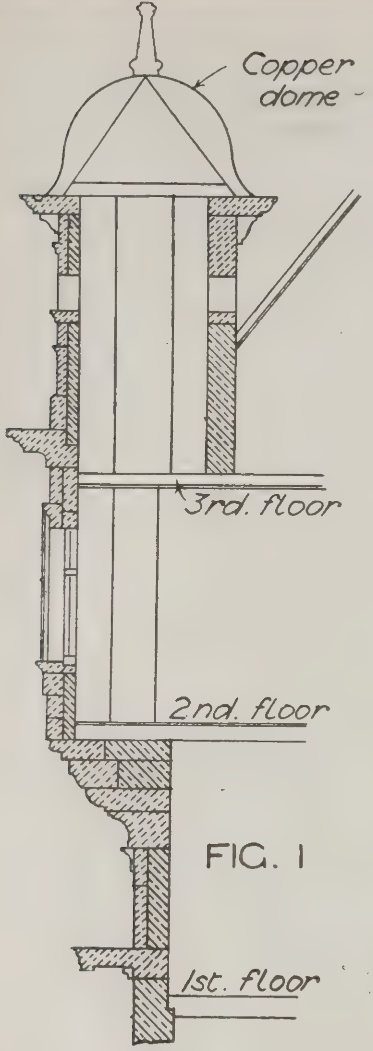


FIG. 1

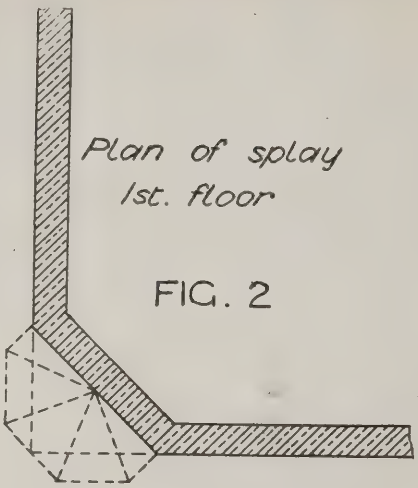


FIG. 2

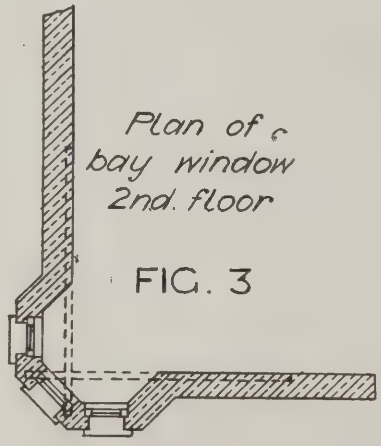


FIG. 3

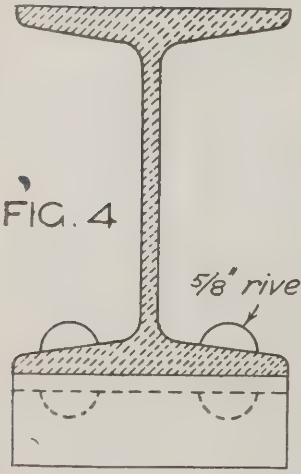


FIG. 4

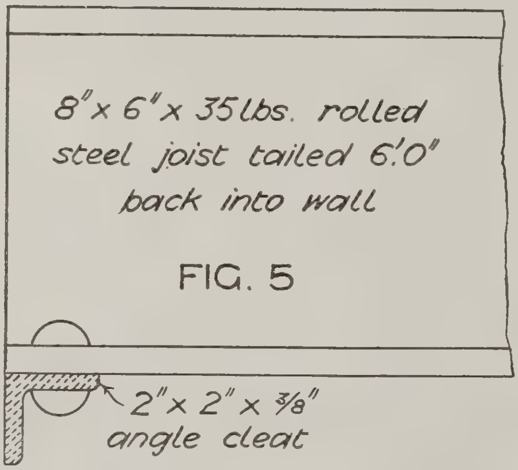

8"x 6"x 35lbs. rolled steel joist tailed 6'.0" back into wall
2"x 2"x 3/8" angle cleat

FIG. 5

ILLUSTRATING REPLY TO "PRESTON.—F.C.G."

ported at the end, the maximum bending moment on the cantilever portion of the joist$=\frac{2}{3}\times 3.25\times 6\times 12=156$ ton-in. Allowing 10 tons per sq. in., the section modulus should be $\frac{156}{10}=15.6$in. units, requiring a (B.S.B. 10) 6in. by 5in. by 25lbs. rolled steel joist in each direction tailed 6ft. back into wall, which must be solid, and have proper stone template. The load on each of the two lower joists will be, say, 3.3 tons, which may be taken as all supported at the ends to allow for contingencies, and the maximum bending moment$=3.3\times 6\times 12=237.6$ ton-in. Allowing 10 tons per sq. in., the section modulus$=\frac{237.6}{10}=23.76$ in. units requiring a (B.S.B. 14) 8in. by 6in. by 35lbs. rolled steel joist in each direction tailed 6ft. into wall as before. Figs. 4 and 5 show the method of getting a firm hold on the stonework by the joists. The stone corbelling should be shored up while building, and the angle cleats on end of girders should be let in the stone and well grouted with cement to make a solid connection. No back straps will be needed, but the stones should all be cramped together and have bed dowels properly fitted.

HENRY ADAMS.

York, Beverley, and Howden.

LOCKWOOD.—L. S. writes: "Is there at York, Beverley, or Howden, any work suitable for measuring for 'testimonies of study' for the R.I.B.A. Final?"

An abundance of material for study and measurement occurs at either of the places named. At York, a bay of the Minster nave or choir might be measured, or, if less is desired to be attempted, one of the fine tombs, say, Archbishop Bowet's or Archbishop Walter de Grey's, might be done. The Chapter House would also be an excellent subject. One of the smaller churches, such as Holy Trinity, Micklegate, might be completely measured, or a good set of drawings of either of the three ancient gateways, Bootham Bar, Micklegate Bar, or Walmgate Bar, would be suitable. In Renaissance work, the Assembly Rooms by Burlington or Kent, or the County Court House by Carr, would be worth recording. At Beverley, either the Minster or St. Mary's Church would provide an amplitude of subjects. Of the former, the "Percy shrine," a portion of the stalls, or the back of the altar screen could be measured, at the latter the south porch would be suitable. Howden Church and Chapter House would also both be excellent for the purpose. G.

Convalescent Homes.

WIMBLEDON.—T. S. writes: "Please name a good book dealing with convalescent homes, or any papers which have been read on the subject. Please mention an up-to-date convalescent home that might be visited."

I am not aware of any books dealing with the design of convalescent homes, or of any papers which have been read during recent years upon the subject. The principles to be followed, however, are not widely different from those of sanatoria, upon which a considerable amount has been published recently (see, for instance, the competitive essays prepared at the inception of the scheme for the King's Sanatorium). There are two good convalescent homes in connection with London hospitals at Swanley, Kent, and one in connection with the Mount Vernon Hospital, Hampstead, is at Northwood, Middlesex. Permission to visit could no doubt be obtained from the medical superintendent. Plans of the King's Sanatorium appeared in the "Architectural Review," Vol. XIX. G.

Sketching Tour in Derbyshire, Cheshire, or Shropshire.

DOUGLAS.—G. A. K. writes: "I purpose going for a sketching tour in Derbyshire, Cheshire, or Shropshire. Can you give me any information as to which of these counties, and what particular part thereof, would be most suitable? I believe there are many buildings of interest on the route from Shrewsbury to Ludlow."

The route you propose should provide plenty of material for a good sketching tour. On the way from Shrewsbury, Acton Burnell (Early English church and castle) should be visited, also Church Stretton and Stokesay (castle 13th century, with fine Elizabethan gatehouse), Stanton Lacey (Norman church), and Bromfield. At Ludlow, see Lane's Hospital, the Reader's House, Ludford House, and Dodmore Farm (near). Return by Cleobury Mortimer, Bridgnorth (Bishop Percy's House), Much Wenlock (Abbot's house), diverge to Buildwas, thence by Wroxeter to Shrewsbury. In Shrewsbury itself the old houses in Butcher's Row and High Street, and the Court House should not be missed. A good tour could alternately be arranged in the northern part of Derbyshire, where within a ten-mile radius of Chesterfield may be seen Haddon Hall, Hardwick Hall, Bolsover Castle (1613), Barlborough Hall (1583), Eyam Hall, and Chatsworth, possibly less picturesque than the timberwork of Shropshire, but of more architectural interest. If Ashbourne is passed, the fine church, with its interesting monuments, should be seen. In north-east Cheshire, around Macclesfield, Congleton, Alderley, and Bramhall is a quantity of interesting half-timberwork, of which Moreton Old Hall is a typical specimen. See an interesting article in the "Architectural Review," Vol. II., p. 275, and also consult "Old Cottages and Farmhouses in Shropshire, Herefordshire, and Cheshire," by Jas. Parkinson and E. A. Ould, published by B. T. Batsford. G.

Societies' Reports.

The Liverpool Architectural Society.

The annual general meeting of the Liverpool Architectural Society was held at the society's rooms, 13, Harrington Street.

After the minutes of the last annual general meeting had been read and passed, and Mr. J. A. Harrison, A.R.I.B.A., elected an associate of the society, the annual report of the council for the official year 1908-9 was considered at some length.

Mr. Alfred Culshaw, F.R.I.B.A., expressed his regret at the council's action, taken in concert with the Manchester Society of Architects, in forming a competitions committee to inquire into the conditions of competitions, with a view to securing their alteration, should they appear unsatisfactory to the committee. This course, he stated, had been pursued without the cognisance of the council of the Royal Institute of British Architects, which had merely received an irregular notification afterwards. The whole business was calculated to give the council of the Institute a quite incorrect impression of the society's intentions.

In reply, Mr. E. P. Hinde, A.R.I.B.A., urged that the society's council were entirely justified in allying themselves with the Manchester Society in the appointment of a separate competitions committee apart from that of the Institute. This action had not been taken in opposition to the Institute, but rather with a view to facilitating its work, and on that ground alone the Institute would certainly be disposed to overlook whatever unintentional irregularity in the manner of notification might have occurred. It was frequently impossible for the competitions committee of the Institute to deal satisfactorily with provincial competitions, both on account of the essentially metropolitan character of the committee, and the difficulty of obtaining immediate decisions at short notice on urgent questions, through the length of time involved in the necessary formalities of procedure.

Moreover, the committee formed had already done good work: their representations to a certain corporation, in the case of a competition, had resulted in the issue of new conditions.

The meeting then proceeded to the election of officers and council for the ensuing year, Mr. T. E. Eccles, F.R.I.B.A., being re-elected president, Mr. E. P. Hinde, A.R.I.B.A., and Professor H. Reilly, M.A., F.R.I.B.A., vice-presidents, Mr. G. W. Fraser, A.R.I.B.A., and Mr. Ernest C. Aldridge, honorary secretaries, and Mr. C. W. Grayson, A.R.I.B.A., and Mr. C. W. Harris, A.R.I.B.A., honorary auditors. The following members were appointed to the council:—Fellows: Mr. W. G. Dobie, A.R.I.B.A., Mr. J. Dod, Mr. R. Holt, Mr. M. T. Reade, Mr. P. C. Thicknesse, F.R.I.B.A., Mr. A. Thorneley, F.R.I.B.A., and Mr. W. E. Willink, M.A., F.R.I.B.A. Associates: Mr. L. P. Abercrombie and Mr. A. R. Keighley, A.R.I.B.A.

The proceedings, as usual, terminated with an address from the president, in which he reviewed the chief events of both local and general interest in the architectural world, making special reference to Mr. Lever's creation of a chair of Civic Design in the University of Liverpool, and the appointment of Mr. Stanley D. Adshead, F.R.I.B.A., to the Associate Professorship. He wished to emphasise the fact of the appointment not being merely an academic affair. The committee responsible for the selection of Mr. Adshead was thoroughly representative of all interests, and included amongst its members such men as Mr. Brodie, the city engineer, and Mr. T. Shelmerdine, the corporation architect.

After referring to the absence of Professor Reilly in the United States, where he is engaged in investigation both as to the formation of schools of town-planning and as to the methods employed in the laying out of cities, Mr. Eccles passed to more general matters.

It was daily becoming more necessary, he urged, for the modern architect to keep closely in touch with recent developments, both in methods of construction and in material. In this connection the Building Trades Exhibition furnished great evidence of the strides lately made in these directions, and could not fail to impress those fortunate enough to be able to study them personally. Turning to the Institute's proposals with regard to provincial representation on the council, Mr. Eccles expressed his entire dissatisfaction with their provisions. He pointed out that by limiting the number of deputies from the provinces to the presidents in office of the three largest county societies, provincial representation would be hopelessly inadequate, and the arrangement would act with particular injustice in the case of Ireland, which upon such a basis of representation could never hope to have any voice in the decisions of the council. Moreover, the essentially metropolitan character of the latter was preserved by the non-existence of any concerted action amongst provincial societies to secure the promotion of their interests. However, he was happy to be able to state that certain improvements in this condition of affairs had already been effected. The Liverpool and Manchester Societies had of late been working very amicably together, and in consequence had been enabled to take effective action in the important matter of competitions.

Finally, it was a matter for congratulation that the attendance at the society's meetings had been uniformly good. The very high level of the papers with which they had been favoured during the past year was undoubtedly in no small measure due to the assiduous discrimination of the society's secretaries, to whom he desired to tender the sincerest thanks. In conclusion, Mr. Eccles referred, with unaffected regret, to the death of Mr. Ould, in whose office he had at one time been a pupil, and who will be well known to our readers as one of the chief authorities on half-timbered work in England.

Society of Architects.

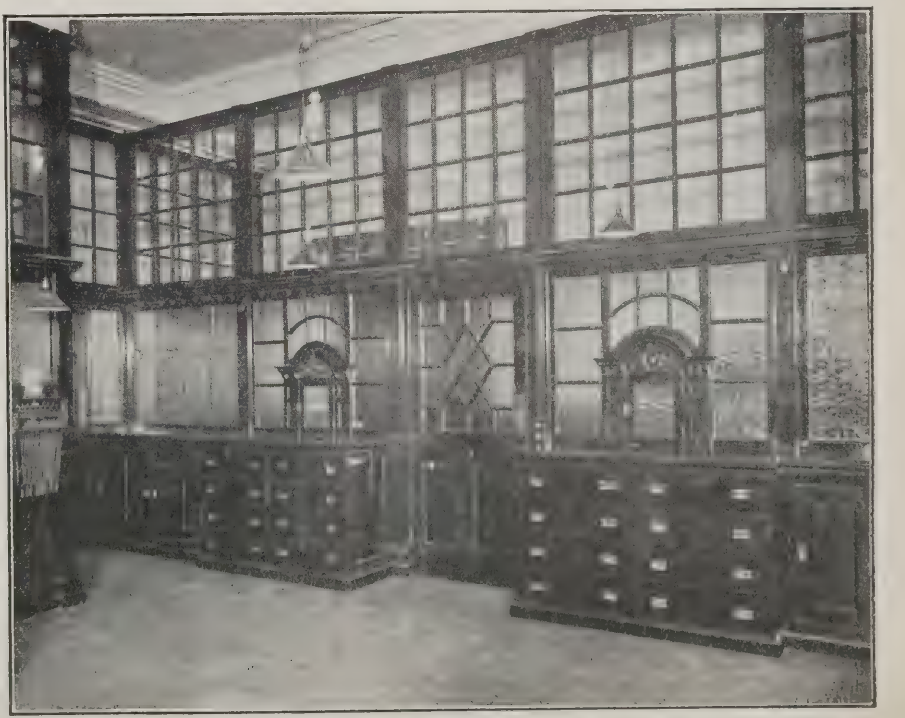
A party organised by the students of the Society of Architects visited St. Albans on Saturday week. Mr. Edmunds, the local member of the society, was kind enough to make all arrangements on the spot, and to obtain the services of Mr. Ashdown, F.G.S., a high authority on the architecture and antiquities of St. Albans, and author of the very successful Pageant of 1907. Mr. Ashdown delivered a short discourse on the history of the abbey from earliest times to the restoration by Lord Grimthorpe. The party was then conducted round the chapels, sanctuary, and nave. A vote of thanks was accorded to Mr. Ashdown, and the members of the party settled down to sketching. At tea it was announced that the President of the society had offered a prize of three guineas to the student producing the best work on this and subsequent sketching expeditions. Visits to places of interest will take place on June 19th, July 17th, and September 11th, 1909. During the winter months, a students' night will be held at the Society of Architects, when sketches will be exhibited, and Mr. Bond's prize awarded.

Edinburgh Architectural Association.

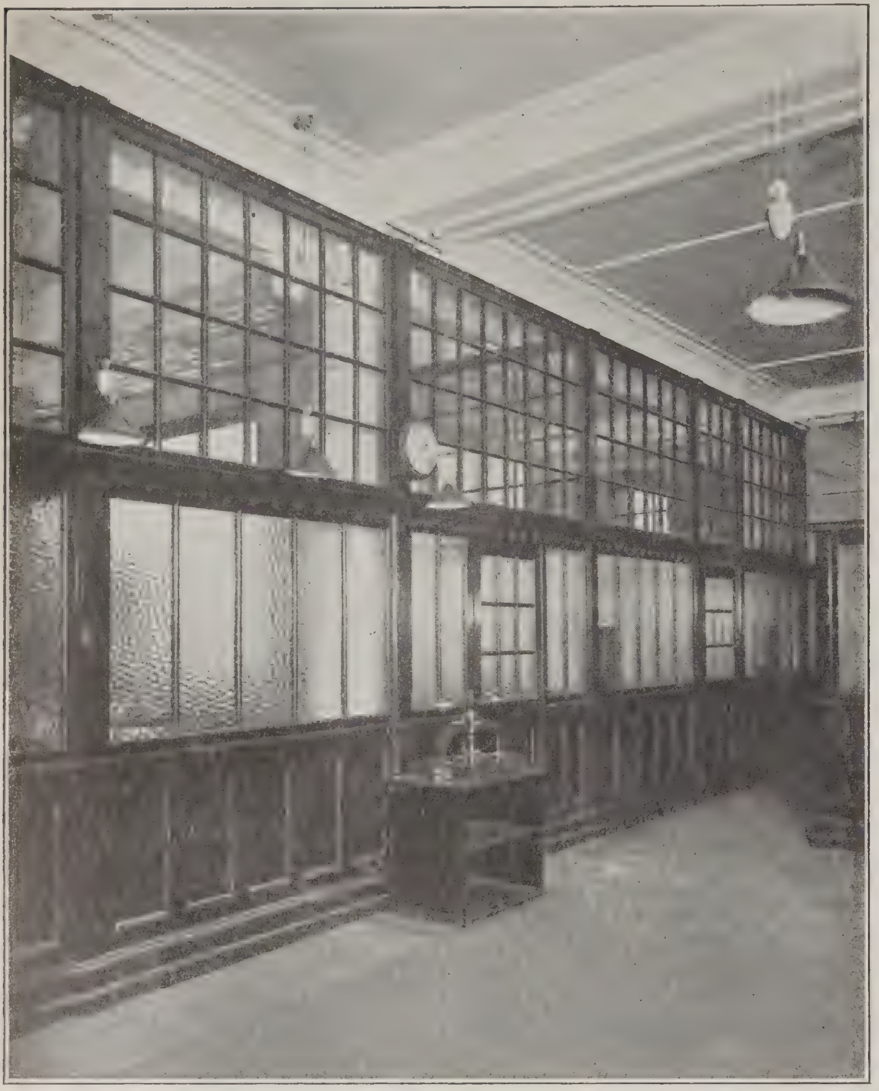
Members of the Edinburgh Architectural Association visited Borthwick Church and Borthwick Castle, the latter through the kindness of Mr. Henry Borthwick, who took the party over the ancient building. It was built by the first Lord Borthwick in 1430, was partly destroyed by Cromwell in 1650, but again inhabited till about 1740, from when it stood in ruins till it was restored partly in 1892 by the late Mr. John Borthwick and completed by the present occupant.

NEW OFFICES, No. 1, LLOYD'S AVENUE, E.C.

These photographic illustrations represent two views of the new offices of Messrs. Sola and Aznar, No. 1, Lloyd's Avenue, E.C., erected by Messrs. Colls and Trollope from the designs of Messrs. Chatterton and Couch, AA.R.I.B.A. As often happens in City work the clients required a large office area (about 66ft. by 60ft.) divided by means of glazed screens into a suite of offices. There are about 370ft. run of 2in. Tobasco mahogany partitions forming a large general office, eleven smaller ones for the various departments, an entrance lobby, and a book store. Some of the screens are of the full height from floor to ceiling, while others do not exceed 7ft. 9ins. in height. The capping of the lower screens forms an intermediate rail for the higher ones, and the glazing above and below this level is of sheet and Flemish glass respectively. In the general office and one of the smaller offices are enquiry openings communicating with the entrance lobby, which have carved heads—as may be seen in one of the photographs. The offices were in occupation seven weeks after the date on which the architects received their instructions.



OFFICES, 1, LLOYD'S AVENUE, LONDON. E.C. CHATTERTON AND COUCH, AA.R.I.B.A. ARCHITECTS.



OFFICES, 11, LLOYD'S AVENUE, LONDON, E.C. CHATTERTON AND COUCH, AA.R.I.B.A., ARCHITECTS.

Proposed New Buildings.

CARDIFF.—The Building Committee of the Cardiff Guardians are discussing the question of temporary accommodation at the Ely Workhouse.

COVENTRY.—The City Council are considering sites for the new Municipal Buildings and for a new elementary school in Narrow Lane.

LEICESTER.—A L.G. Board enquiry has been held regarding a loan of £6,000 for the erection of public baths in Knighton Fields Road, Alyestone.

LIVERPOOL.—A L.G. Board enquiry has been held regarding a loan for the provision of a public washhouse in Netherfield Road, North.

A L.G. Board enquiry has been held regarding a loan of £18.590 to purchase a site for public baths on the east side of the Dock Board offices.

The Bishop of Liverpool's Fund has received a donation of £10.000 towards the erection of a church in that diocese.

LONDON, S.W.—The Managers of the Cancer Hospital, Fulham Road, are appealing for funds either to erect a new hospital containing about 50 beds within a reasonable distance from London at a cost of £23,000, or to erect a new wing at the hospital to contain about 36 beds at an estimated cost of £13,000.

The Imperial College of Science and Technology have received a donation of £50,000, from the Goldsmiths' Company, towards the extension of the department of engineering.

LONDON.—Among the proposed new works recommended for the consent of the London County Council at its meeting on Tuesday last were the following:—Erection of a building on the western side of Balham High Road, Wandsworth, to abut also upon the southern side of Marius Road, on the application of Mr. A. C. Thomas, on behalf of the Temperance Billiard Halls, Limited. Erection of a house on the north-eastern side of Champion Hill, Dulwich, on the application of Mr. G. Le Morris. Erection of four buildings on the western side of Princes Square, Stepney, at less than the prescribed distance from the centre of the roadway of the street, on the application of Mr. E. C. Gough, on behalf of Mr. J. Blum.

LUTON, KENT.—The Chatham Town Council are purchasing a site for new schools here.

NOTTINGHAM.—Official sanction has been accorded to the Guardians for spending £7,000 to add a new wing to the workhouse. This institution was built only six years ago at a cost of £250,000.

SALFORD.—It has been resolved to build an annexe to the Town Hall at an estimated cost of £16,476, furnishing and extras amounting to £3,500 more.

TORQUAY.—The plans of the borough surveyor, Mr. H. A. Garrett, for the Pavilion and the new Town Hall have been approved. The Pavilion is estimated to cost from £15,000 to £20,000, including furnishing, and the Town Hall about £22,000. It is expected that the latter work will be commenced first.

Buildings in Progress and Completed.

APPLEDORE.—A new tower is being erected to the Parish Church of St. Mary. Mr. John J. Smith, A.R.I.B.A., of Bideford, is the architect.

ARBROATH.—Messrs. G. and R. Cousins, of Edinburgh, are the successful contractors for the rebuilding of Arbroath Station. The work is estimated to cost from £40,000 to £50,000 and to last two years.

BARNSTAPLE.—For the erection of the new secondary school, the tender of Messrs. Pollard and Co., of Taunton, for £9,263, has been accepted.

CARLTON.—A new school has been erected in Standhill Road at a cost of £3,700.

DUBLIN.—New premises for Messrs. Thomas Dockrell and Co., in South Great George Street, have been completed from the designs of Messrs. Kaye, Parry and Ross.

GLASGOW.—A new hotel, the Great Eastern, with 400 bedrooms, has been erected in Duke Street. The architect is Mr. Neil C. Duff, of Wellington Street.

HARROGATE.—Tenders for the extension of the Royal Baths have been let as follows: Mason's work, Kershaw and Hill, Harrogate, £2,685 6s.; joiner, Rhodes Bros., Shipley, £627; plumber and glazier, Braithwaite and Co., Harrogate, £199; slater, T. Rayner, Harrogate, £220 5s. 6d.; plasterer, A. Calverley, Harrogate, £624; painter, Decorative Supply Co., Harrogate, £126 10s.

LEEDS.—The nave of the new Church of St. Edmund, Roundhay, has been completed from the designs of Messrs. Carby, Hall and Dalby, of Leeds. The cost of the whole work will be between £10,000 and £11,000.

LLANDRINDOD WELLS.—The Radnor County Buildings have just been opened. The County Surveyor was the architect.

LOCHGELLY.—The new Municipal Buildings, erected from the designs of Messrs. A. Scobie and Son, Dunfermline, at a cost of about £2,500, have been formally opened.

LONDON.—The new Victoria and Albert Museum buildings are to be opened by the King, accompanied by the Queen, on Saturday, June 26, at 12 noon.

RICHMOND, SURREY.—A new secondary school for girls has been erected at Parkshot. Messrs. Jarvis and Richards, London, were the architects, and Messrs. Soole and Son, of Richmond, the builders.

RUGBY.—The King will open, on July 3rd, the new Speech Room at Rugby School, which has been built as a memorial to Archbishop Temple. The building is of brick with stone dressings, and the roof is covered with green Westmorland slates. It will seat 1,100 people, and has cost about £13,000. Mr. T. G. Jackson, R.A., is the architect.

STRATFORD, ESSEX. — New Sunday schools in connection with the Conference Hall, have been opened. They will accommodate about 600 scholars, and were designed by Messrs. George Baines and Son, architects, 5, Clements Inn, Strand, W.C., and carried out by Mr. J. W. Jerram, East Ham, under contract at £1,930.

WATFORD.—A tender for the Leavesden Road Baptist Church and Institute has been accepted. The block is designed in a free treatment of late Gothic. The facings are in pressed red bricks and the dressings in Bath stone. The church will accommodate about 700 persons. The architects, whose design was selected in a recent competition, are Messrs. George Baines and Son, 5, Clement's Inn, Strand, W.C. The contract, which amounts to £4,150, is let to Messrs. Brightman and Son, of Watford.

WOLVERHAMPTON.—The tender of Mr. Henry Lovatt, Wolverhampton, at £9,205, has been accepted by the Town Council for the erection and completion of a new second class swimming bath. The tender was not the lowest, but the time required was stated to be the shortest.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

The Economy of Reinforced Concrete.

We must expect some misunderstanding as to the features of reinforced concrete because the method of construction is novel to the majority of architects and engineers. Therefore, it is not surprising to find a good deal of misconception in respect to the economy of the construction. There seems to be a general belief that reinforced concrete is claimed by its advocates as more economical than any other form of construction for every conceivable purpose. That is of course erroneous. Reinforced concrete is economical in its proper place. It is not always so cheap as other construction of a permanent character, though sometimes it may be even cheaper in first cost than a temporary construction. It has its limitations like everything else.

Rival Specialists.

Naturally the specialists in steel are pleased to be able to score a point occasionally against the reinforced concrete specialist by proving that for some particular work the more usual construction in steel joists and concrete works out cheaper than a reinforced concrete structure, while the brickmaker is pleased to be able to acclaim brick walls for many situations as cheaper than plain or reinforced concrete walls. Such testimony is partisan evidence, but yet the profession is often misled by it. We cannot assert definitely yet what are the limitations in the various methods of construction; for some time to come we must collect and gain practical experience by comparing the several solutions offered to our problems. The difficulty is complicated by the fact that theory and practice in the older methods of construction are changing. For instance, we have steel frame construction, which when logically designed is a very economical method. In such steel frame buildings reinforced concrete can often be used economically only for floor slabs, because main beams and columns of the combination material do not show any saving. On the other hand the building may be of such a form and such a nature that reinforced concrete is the most economical construction. In asking for competitive tenders there are very often hampering conditions, many which are dictated by effete by-laws. The comparison is not then quite fair.

Incidental Economies.

Wherever possible a free hand should be given the specialist designer to introduce all the incidental and contributing economies in other directions, just the framing and floor, say. For instance, with both steel frame and reinforced concrete frame construction, the walls and partitions can be reduced in thickness. By reinforcing the brickwork we can also reduce the thickness and transmit the loads direct to supports without providing beams and foundations all the way along them. Then the main foundations can be altered. The whole matter is an engineering problem, and the engineer should be fettered as little as possible by the architect in his endeavour to find the most economical solution. In using the word economy, too, we must remember that true economy is not always the smallest first cost.

Life and Efficiency.

The life and efficiency of the structure must be considered. It is quite unfair to compare light timber floors that are not fireproof with reinforced concrete floors. In small structures, such as houses, very often we cannot usefully employ reinforced concrete, though we may find advantage in adopting the analogous construction of reinforced brickwork. Where floors are required to be fire-resisting our experience is that usually reinforced concrete construction can show considerable reduction in first cost with equal, if not superior, efficiency to other materials; steel joists, beams and stanchions and cast-iron columns may, however, often prove more economical than similar members in reinforced concrete, and *vice versa*. Perhaps the most striking economies offered by reinforced concrete are in engineering structures. In foundations, retaining walls, bridges, etc., great savings have been effected, and in many places too, pipes, water mains, sewers, and piling, have been economically constructed in reinforced concrete.

Specific Instances.

If specific instances are wished for we may cite the new General Post Office buildings, which were stated in Parliament to show a saving of about 20 per cent. by the adoption of reinforced concrete, not over the whole building, but only that part where it was used in substitution for the ordinary construction. That is perhaps exceptional, though we know of cases where the saving was even greater. So much for building; now in regard to engineering. A very interesting case has recently occurred as showing the economy often to be effected by reinforced concrete, namely, at Waterford. It is proposed to construction a new bridge over the River Suir, and the Waterford Bridge Commissioners recommended the adoption of a steel girder bridge, estimated to cost £97,000. This was increased by the cost of erecting a temporary bridge £10,000, by law expenses £500, engineering £4,000, and resident engineer and inspectors £3,000, the total working out at £114,500. The contributory authorities, namely, the Borough of Waterford, the County of Kilkenny, South Tipperary, Waterford County, County Wexford, North Tipperary, Queen's County, and County Carlow, all appealed against this decision to the Judicial Committee of the Privy Council, and their approval succeeded.

Mr. Gordon, K.C., stating the case on behalf of the county borough of Waterford, said that all the petitioners objected to the excessive expense of the proposed bridge, and the plans of it. South Tipperary and County Wexford objected to a temporary bridge, while the city of Waterford felt that a temporary bridge was necessary. The commissioners had reported in favour of the erection of a new bridge, the cost of which was £97,000, a figure which was increased by additional items of expenditure to £114,500. What the city of Waterford wanted was a ferro-concrete bridge with six spans, each 47ft. 10ins., at a cost of £47,000, which meant a considerable saving as regards original outlay, and also a substantial saving in the rates to be paid by the contributing areas. Then a steel-girder bridge would have to be painted every three years at a cost of £800, while the cost of painting a ferro-concrete bridge would probably not exceed £100. As between the two classes of bridges Waterford stood to lose or win about £900 a year.

Expert Testimony.

After hearing a considerable amount of evidence on both sides, including that from Mr. William Friel, engineer to the Waterford Harbour Board, Mr. A. Cameron Hurtzig (a partner of the late Sir Benjamin Baker), Mr. C. S. Meik, Mr. J. S. E. De Vesian, Mr. Price, engineer for Cork Harbour, and others, the Lord Chancellor said that as all the parties desired ferro-concrete and undertook its responsibility, the committee did not think it expedient to go against their views. There appeared no doubt that greater economy would result from the adoption of this material, and this consideration was legitimate as long as economy was consistent with efficiency and durability. It would be necessary that plans and specifications should be brought before the committee, and consequently they would adjourn the matter until the plans and specifications were ready.

Efficiency of Reinforced Concrete.

We would not wish to suggest the foregoing saving as applicable to all examples of bridgework. We merely instance it as showing the advisability of giving new methods a fair field and no favour, and considering the arguments on both sides with an open mind. If we were all to wait for new methods to be tried and tested for many years, the world would make little progress. We can by proper investigation determine the suitability and sufficiency of any construction in the course of a year or two. There is now an accumulation of testimony that puts the efficiency of reinforced concrete structures beyond doubt, and if it cannot be employed in any one circumstance with a saving it is unwise and unfair to dismiss its consideration for other work even of the same character.

COLOURED CONCRETE!

It is reported from Paris that a distinguished French chemist has discovered a method of producing coloured concrete. This he does, we understand, not by adding pigments, but by means of some special process or treatment that develops the colouring matter latent in certain constituents of the concrete itself. At present, however, the subject seems to possess but little practical importance.

THE INDENTED STEEL BAR SYSTEM.

The Patent Indented Steel Bar Co., Ltd., of Queen Anne's Chambers, Westminster, have just issued a new edition of their large catalogue, which contains illustrations of work executed subsequently to the former issue. Since the establishment of the business in 1907, its growth and development have been considerable, and now we find the company with branch offices in Manchester, Birmingham, Leeds, and Glasgow, from which preliminary designs and other information can be obtained without delay by clients in the districts controlled by these centres. There are also other agents in Liverpool and Newcastle-on-Tyne to undertake similar work, and sale agents in many other places. In the present edition of the catalogue the illustrations solely refer to work executed in the United Kingdom. We have on various occasions called attention in these columns to the functions which the mechanical bond provided by the indented steel bar is intended to perform, and the theoretical considerations put forward as arguments for its employment. The bar is rolled from high carbon steel, and, consequently, has a high elastic limit and a high ultimate strength. The mechanical bond and the high elastic limit, combined with readiness to supply information and assistance, and with progressive methods, have evidently resulted in much business for the company.

A STRONG CONCRETE BRIDGE.

The extraordinary strength of concrete, and hence its trustworthiness as a structural material, are very strikingly illustrated in an interesting letter to the Editor which appears on page 495, in which are detailed the structural particulars of a bridge built for the Dusseldorf Exhibition, which withstood all endeavours to destroy it by loading, and ultimately had to be demolished by means of explosives.

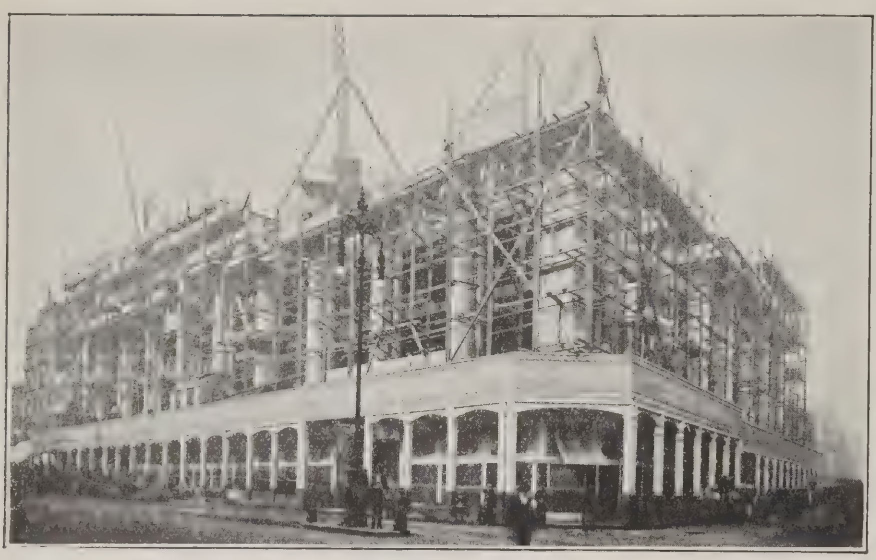


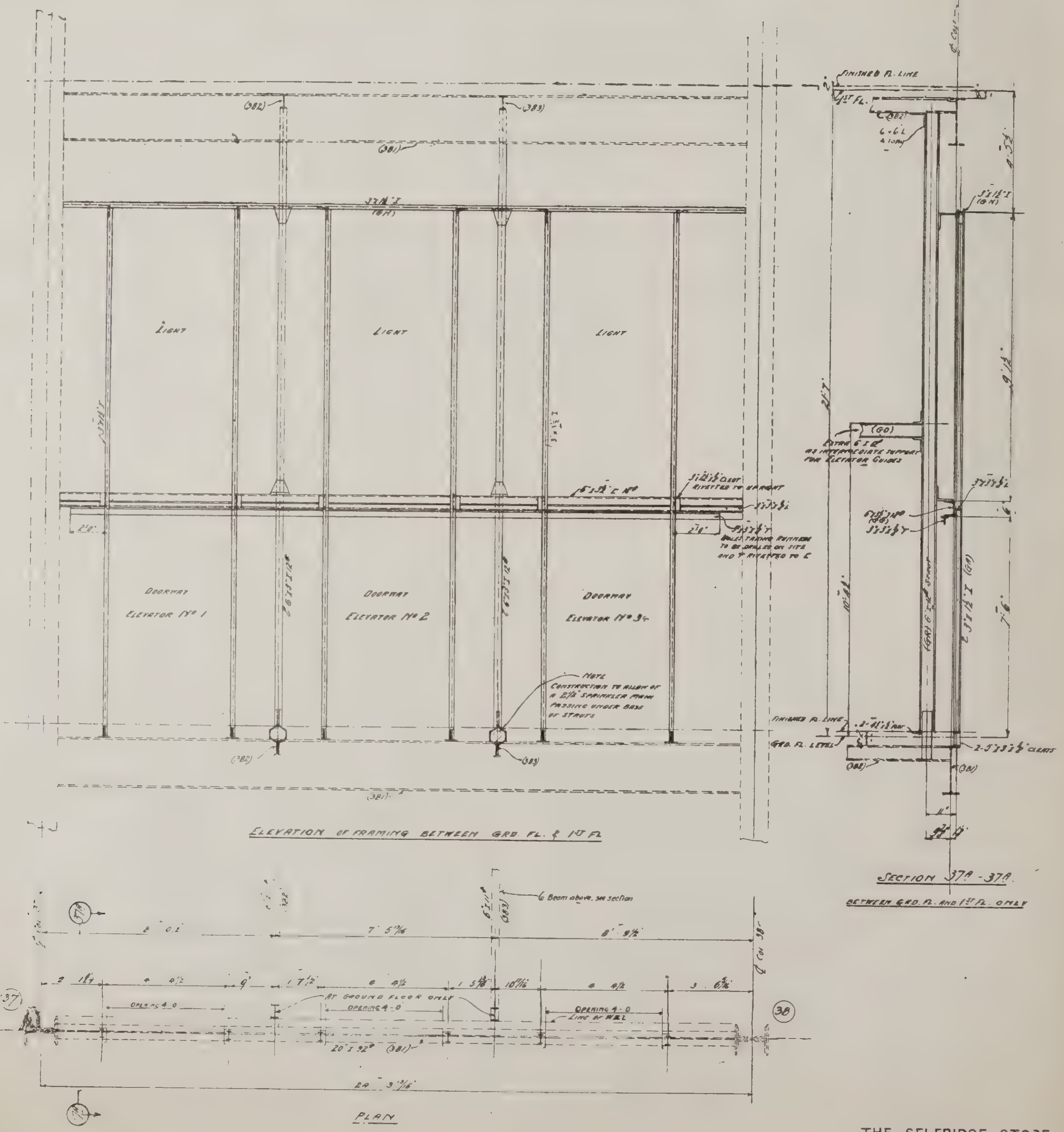
FIG. 1.—THE SELFRIDGE BUILDING NEARING COMPLETION.

STEEL CONSTRUCTION AT THE SELFRIDGE STORE.

In this issue we continue our publication of detail drawings and photographs of the main construction of the Selfridge Store in Oxford Street, London, W., and we shall supplement them with other details of the special girders in a future issue. In previous issues we have described the main features of this steel frame building, our information being kindly furnished us by Messrs. Waring and White, Ltd., the contractors, and their engineer, Mr. S. Bylander, who was responsible for the design of the engineering work in the structure.

On page 496 we publish a photograph of the completed building. Fig. 1 is a photograph from the same point of view, showing the work nearing completion.

Details of the arrangement of spandril beams at the first floor are shown in Figs. 2 and 3. Plate diaphragms are used to brace the beams and keep them at the required distances apart.


LIGHT
LIGHT
LIGHT
DOORWAY ELEVATOR No 1
DOORWAY ELEVATOR No 2
DOORWAY ELEVATOR No 3
NOTE CONSTRUCTION TO ALLOW OF A 2½" SPRINKLER MAIN PASSING UNDER BASE OF STRUTS
ELEVATION OF FRAMING BETWEEN GRD. FL. & 1ST FL.
FINISHED FL. LINE
GRD. FL. LEVEL
SECTION 37A - 37A
BETWEEN GRD. FL. AND 1ST FL. ONLY
6 Beam above, see section
AT GROUND FLOOR ONLY
OPENING 4-0
PLAN
37
38

THE SELFRIDGE STORE.

Fig. 4 shows the method adopted for carrying the stonework. The main cornice at the fifth floor is carried on steel cantilevers, as indicated in Figs. 5 and 6.

In Figs. 7 and 8 will be seen the steelwork during erection, and the cranes employed for its erection.

In Fig. 7 we would call attention to the bundles of rods lying on the steelwork. These are the rods for the reinforced concrete floors described in previous issues. The rods were "Indented Steel Bars," and were delivered from the mill in bundles already bent as required for the floors as shown in the view. The rods in each bundle were exactly the same in shape, and each bundle had a tag or label to distinguish it, and facilitate erection.

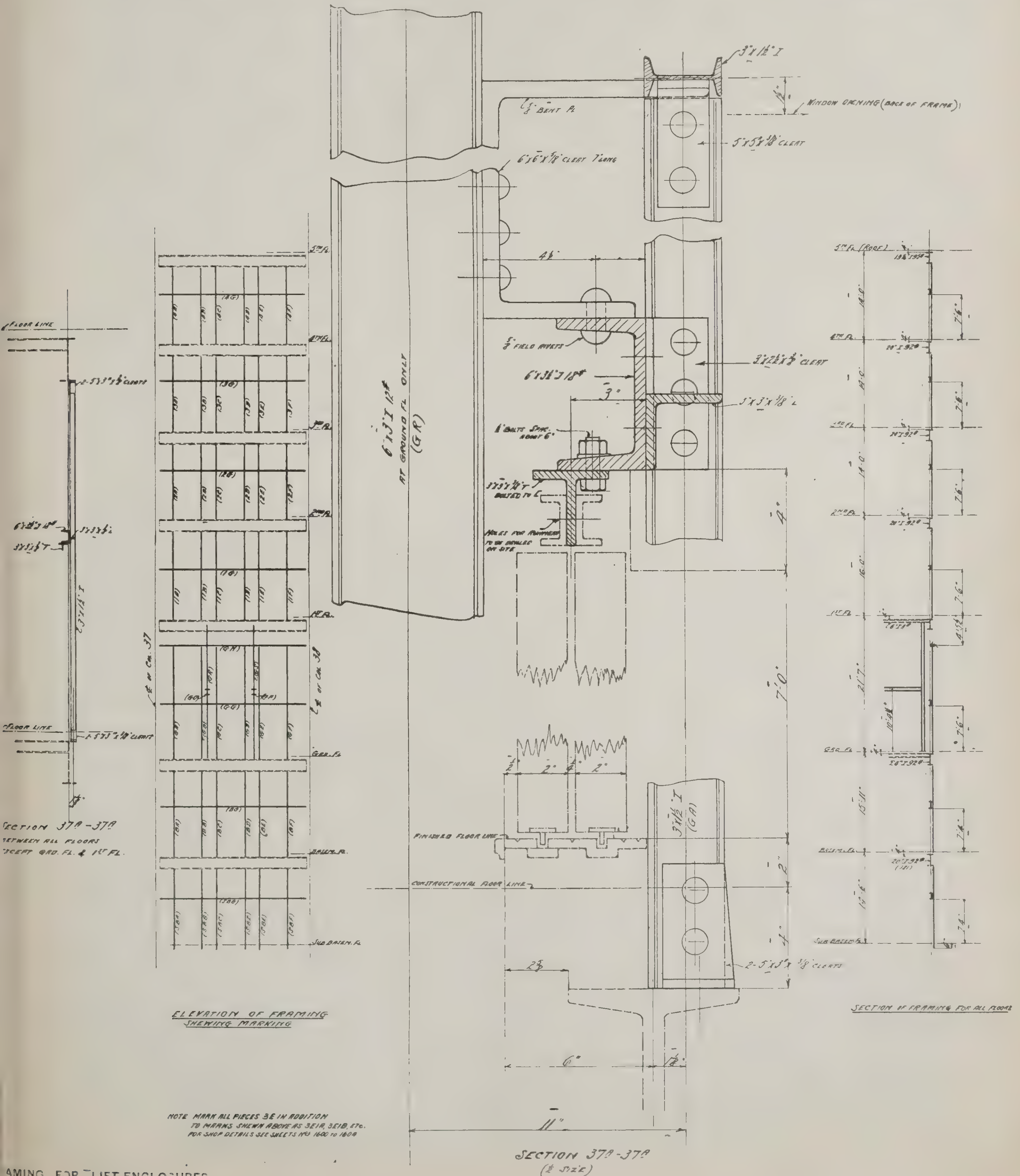
Columns.

The columns are built up of angles and plates.

The girders are connected to the column by means of top and bottom brackets, the bottom angle-iron bracket being strengthened by vertical stiffener angles. Each length of column extends through two storeys, the splice being made about 18ins. above the floor-level by means of splice-plates.

Beams.

Most of the beams used were 20ins. deep. It will be noticed that the position of every rivet is given except for standard connections, when the dimensions are given on a drawing for standard connections. The system used is practically the same as adopted for the Ritz Hotel and "Morning Post" building steel work, both of which buildings were executed by the same contractors, and the steelwork of which was likewise designed by Mr. S. Bylander, their engineer.



AMING FOR LIFT-ENCLOSURES.

TESTS OF REINFORCED CONCRETE BEAMS AT McGILL UNIVERSITY.

During the academic session of 1906-07 a series of tests on reinforced concrete beams having sections of 6 × 8ins. and 8 × 12ins. and reinforced with Kahn trussed bars and Johnson old style corrugated bars, was made in the testing laboratories of McGill University, Montreal, under the direction of Mr. E. Brown, who recently described and discussed the tests before the Canadian Society of Civil Engineers. The following notes are taken from that paper:

The chief difference between these tests and those generally made is stated by Mr. Brown to be the use of five extensometers on each beam in order to learn whether it is correct to determine the position of the neutral axis by the ordinary practice of assuming a linear law of deformation, or strain, between two layers, one near the compression face and the other along the line of steel reinforcement. As a rule but two extensometers are used, determining the deformation at the layers just mentioned, and in addition to these, three were placed at intermediate points in the McGill tests. The deformation curves were then plotted with these five readings, instead of using an assumed law applied to the two extreme readings. By this means the movement of the neutral axis could also be carefully watched. In many cases the curves were practically straight; in most instances they are slightly concave, while in one or two instances the concavity was very marked, especially on the tension side.

Composition.

The concrete was a 1:2:4 mixture, with ¾-in. trap rock, having 46 per cent. voids, river bank sand, and International Portland cement. Ten per cent. of water was used in mixing, and the beams were carefully tamped. The ½-in. corrugated bars had a yield point of about 45,300lbs. per square inch, and a breaking strength of 71,200lbs.; the ½-in. trussed bars, a yield point of 45,000lbs. and a breaking strength of 69,000 lbs.; the ¾-in. trussed bars, a yield point of 38,000lbs. and a breaking strength of 64,000lbs. per square inch. The steel was placed with its centre line ¾in. above the bottom of the beams, and the corrugated rods bent up at the ends to take the shear.

Loading and Deformations.

All of the beams were supported at the ends and loaded at the third points. The extensometers were of reflecting type and for an alteration of length of 0.001in. between gauge points, which were 10in. apart, gave a movement of 2cm. on the scale. By reading to millimeters only, a deformation of 1/200,000 could be measured. From the deformation at the reinforcement line the stress in the steel was found, on the assumption that the elongation of the steel and concrete were the same. From this stress the moment of resistance of the beam was calculated. In order to trace the beginning and progress of cracking, the surfaces were kept moist and viewed by oblique illumination, using mirrors and magnifiers. The load was applied to the beams of 6-ft. span in 500lb. increments and to the beams of 10ft. span in 1,000-lb. increments.

Method of Comparison and Analysis.

The method used in comparing the resisting moment of the beams, as figured from the steel stress, and the actual moment, due to the applied loads, is discussed, in substance, as follows by Mr. Brown: Some of the curves showing the measured deformations at the various layers of the beams show slight concavity, but in nearly all cases the strain curve for the compression layers is very approximately a straight line. If it be assumed that the modulus of elasticity of concrete in compression is constant, the stresses in the concrete will also be represented by the straight line, and the centre of the compression forces will be at a distance from the neutral line, equal to two-thirds of the distance of that line from the compression face of the beam, which distance can be measured from the diagram. By thus measuring the distance of the centre of the compressive forces from the centre line of reinforcement, the length of the arm of the resisting couple can be found. The total tensile force in the steel can be estimated by determining the stress intensity in the steel from the deformation at the reinforcement line, and multiplying by the net area of the reinforcing bars. Neglecting the tensile force on the concrete, the product of the force in the steel and the arm of the couple, gives the resisting moment of the beam as calculated from the measured deformations, and the result can be compared with the actual moment due to the applied loads. Mr. Brown is well aware that this method may be regarded by some as altogether too simple, in that it ignores the variable co-efficient of elasticity of concrete in compression. Before work was commenced he had always felt that many of the formulas which have been proposed and developed from tests on beams are far more elaborate than is justifiable, in view of the variable quality both of the component parts of concrete and of the resulting mixtures. The tests made on the concrete cubes have shown surprising differences in the compressive strains, even when the ultimate strengths have been about the same, and no definite law of variation of the co-efficient of elasticity of concrete in compression could be found from the tests.

Basis of Calculations.

The following simple analysis has been used as the basis of the work, in accordance with the above views:—

Let b = breadth of beam.

d = depth of beam to centre line of reinforcement.

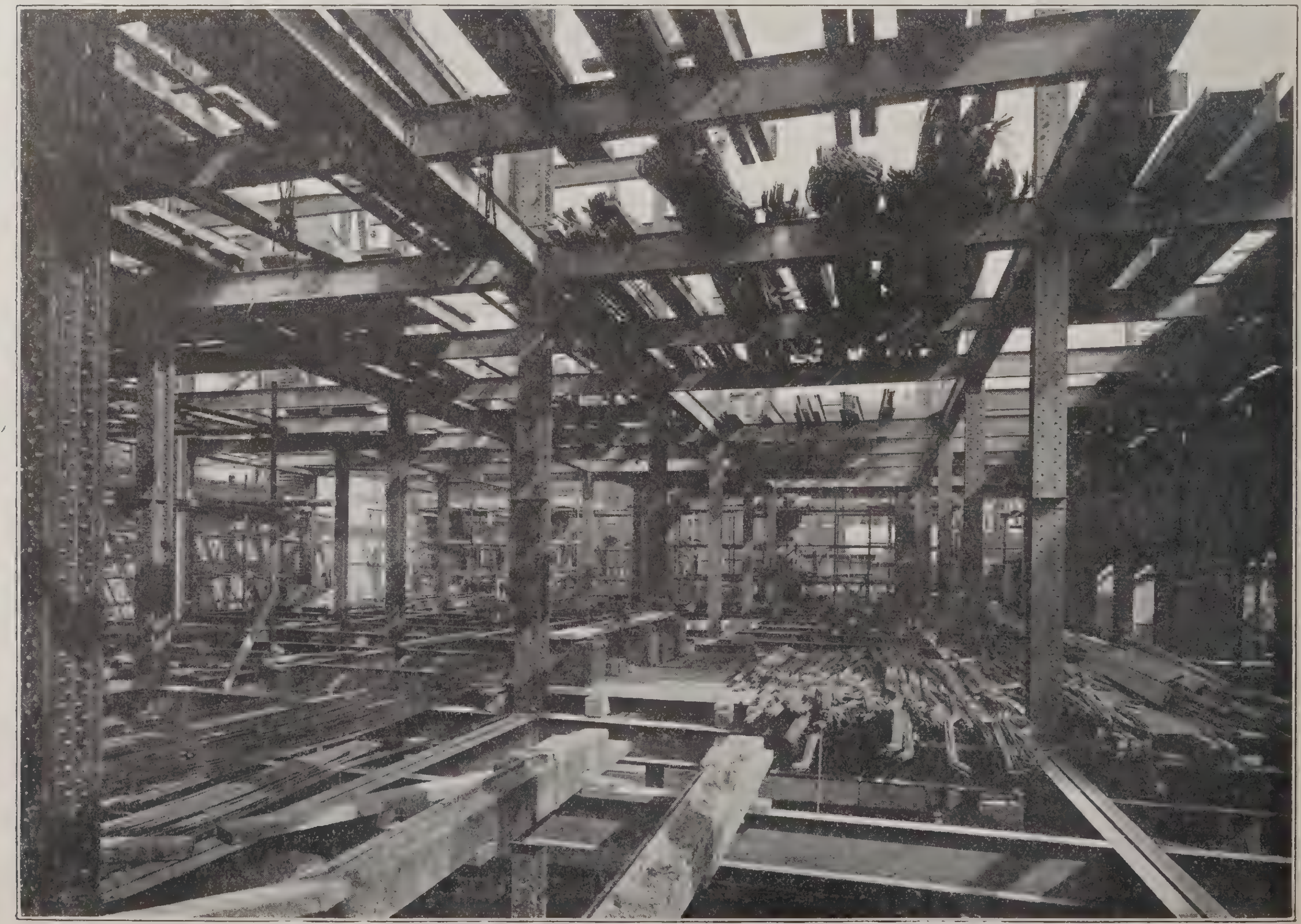


FIG. 7.—THE SELFRIDGE STORE GENERAL VIEW OF THE STEELWORK.

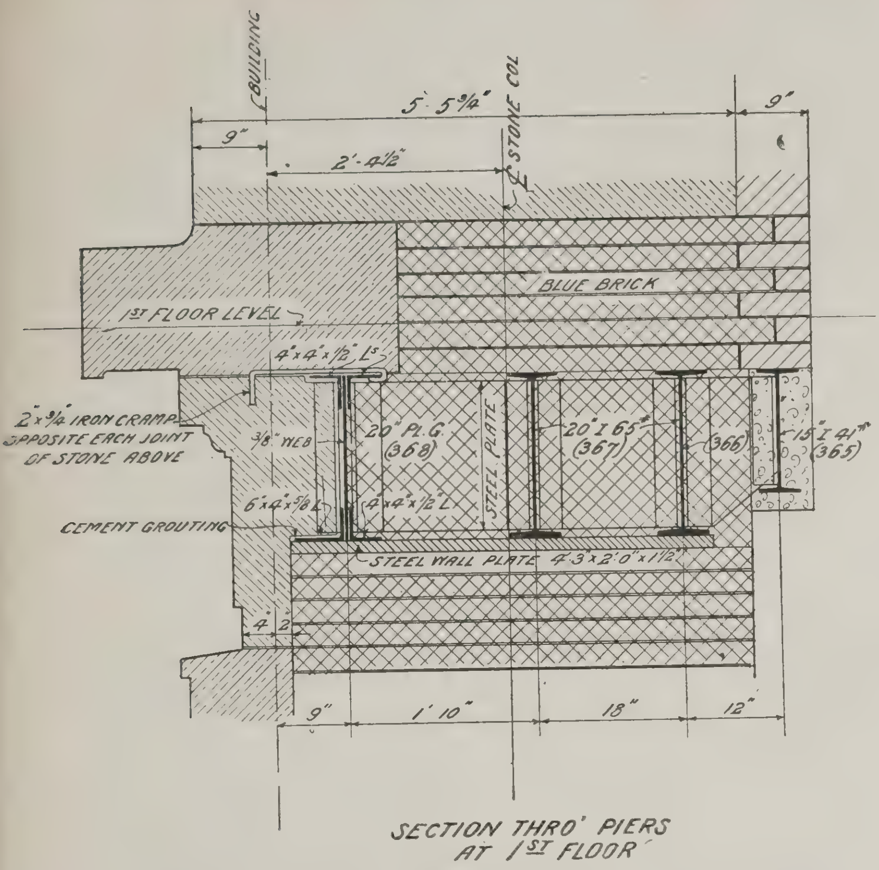


FIG. 2.—THE SELFRIDGE STORE. ARRANGEMENT OF SPANDRIL BEAMS.

xd = depth of neutral axis from outermost compression layer.

A = net sectional area of reinforcing steel.

f_s = intensity of stress in steel.

f_c = intensity of compressive stress in concrete at outermost layer.

E_c = modulus of elasticity of concrete in compression.

E_s = modulus of elasticity of steel in tension.

$c = E_s / E_c$.

Then assuming linear law for variation of compression stress, $bxd\, f_c / 2$ = total comprehensive force $= Af_s$ = total tensile force, neglecting tension in concrete. But if the strain at horizontal layers follows the linear law,

$$\frac{f_c}{f_s} = \frac{E_c\, xd}{E_s\, (1-x)\, d}$$

Hence,

$$\frac{f_c}{f_s} = \frac{2A}{vxd} = \frac{E_c\, x}{E_s\, (1-x)} = \frac{x}{c(1-x)}$$

$$\therefore \frac{x^2}{1-x} = \frac{2\, Ac}{bd} = 2pc$$

where p is the ratio A/bd, or the ratio of section of metal to section of concrete. In this equation c is the ratio E_s / E_c, and the equation gives the position of the neutral axis for any assigned values on the right-hand side of the equation. The equation gives

$$x = \sqrt{p^2 c^2 + 2pc} - pc.$$

Substituting values of p and c in this equation shows that the neutral axis is lower as the amount of reinforcement is greater, and is below the half depth when the reinforcement exceeds 2 per cent. with $c = 15$.

The centre of compressive stresses is at a distance of $xd/3$ from the compressive face, and the moment of resistance of the steel stresses in the beam is given by

$$M = Af_s\, d(1 - x/3) = k\, Af_s\, d,$$

where k is some coefficient to be determined experimentally, and which varies with x; k is found in these tests to vary from 0.82 to 0.88, and is usually about 0.85. This method of analysis is more applicable during the later stages of the loading, than when the concrete is uncracked and carrying some tension. In the earlier stages of loading, the above moment is always much less than the load moment, owing to tension in the concrete.

Variation of Compressed Modulus.

Cubes for compression tests were made from the mixtures used in the making of the various beams. These were tested at different ages, and the tests showed some large variations in the rate of yielding of the concrete under load, although the compressive strength varied but slightly, the latter ranging from 2,080lbs. per square inch to 2,486lbs. per square inch in seven tests out of nine. In connection with a discussion of these cube tests Mr. Brown refers further to the effect of the variation of the compression modulus on the computation of beams. If it be assumed that the compression modulus varies according to some parabolic law, that the vertex of the parabola is at the outermost compression layer, and that the ultimate value of the modulus is two-thirds of the initial value, a theoretical investigation along the above lines shows that when the concrete at the outermost layer reaches one-fourth of its ultimate deformation z, the distance of the centre of compression stresses from the outermost compressive fibre is $0.34xd$; at one-half ultimate deformation $z = 0.35xd$; at three-fourths ultimate deformation $z = 0.36xd$. If a constant modulus is assumed z is always $xd/3$. It will be seen that the result of such deviations from the simple linear law is to alter the position of the centre of stresses very slightly indeed. With the above notation the ultimate moment of resistance of the beam is $Af\ (d-z)$. It is shown by actual tests that for average conditions x may be about 0.4. Thus, for a beam in which $d = 10$ins., the value of z at three-fourths ultimate deformation of concrete is $0.36\ x\ 0.4d = 1.44$ins. Taking $z = 0.33xd$, the result would be 1.33ins., a difference of 1/10in. Thus by making allowance for the variation in modulus concrete, there is a difference of the order of 1/10in. in the value $(d-z)$, the arm of the resisting couple. The theoretical value of x is slightly different in the two cases, but the difference is not so great as to affect the order of the change in $(d-z)$. In deducting the practical value of a formula, the degree of accuracy

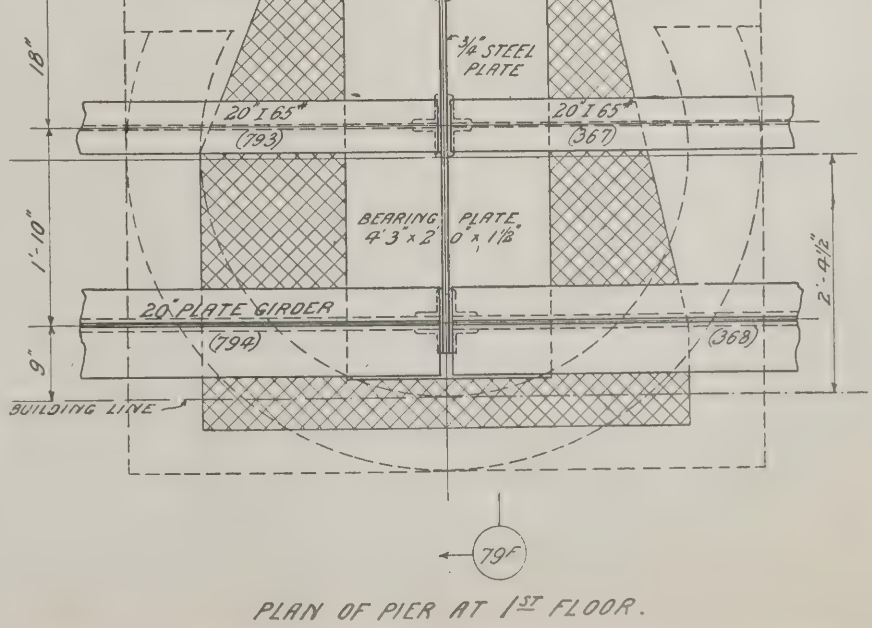
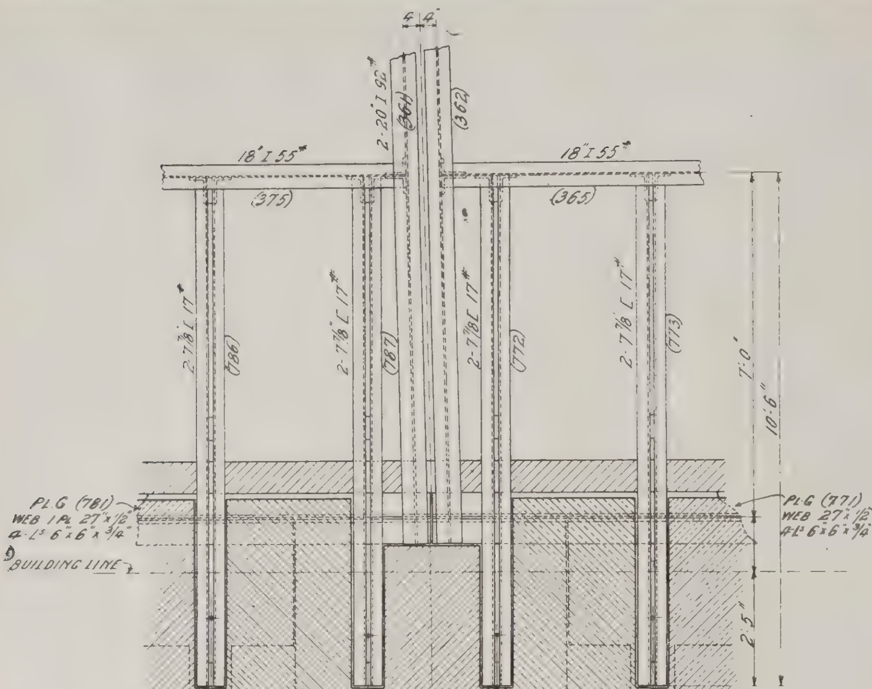


FIG. 3.—THE SELFRIDGE STORE. ARRANGEMENT OF SPANDRIL BEAMS.



PLAN OF CORNICE
AT 5TH FLOOR

FIG. 5.—THE SELFRIDGE STORE. CANTILEVERS TO CARRY CORNICE.

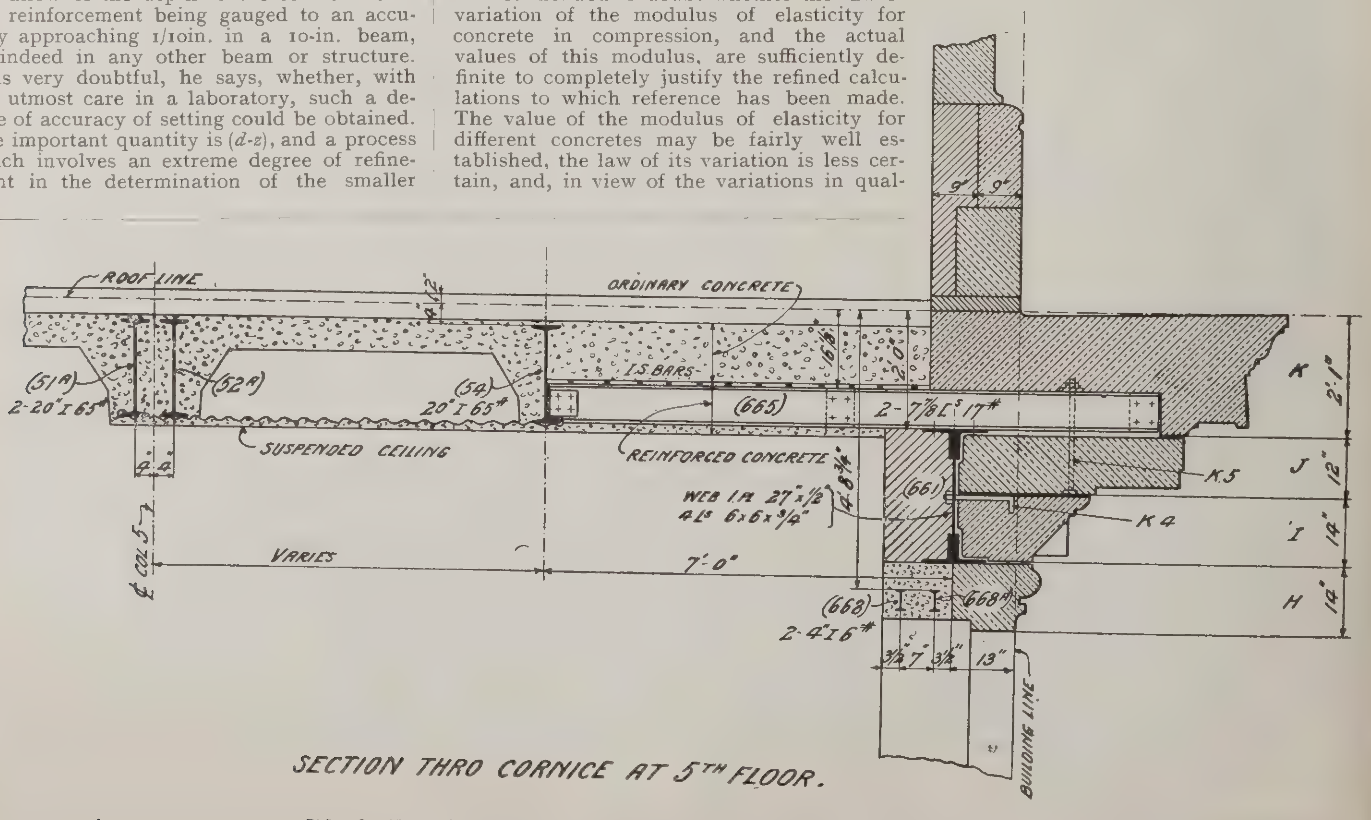
with which the conditions of practice approach the assumed conditions of the analysis must be carefully considered. In this connection Mr. Brown contends that the conditions under which rods are placed do not allow of the depth to the centre line of the reinforcement being gauged to an accuracy approaching 1/10in. in a 10-in. beam, or indeed in any other beam or structure. It is very doubtful, he says, whether, with the utmost care in a laboratory, such a degree of accuracy of setting could be obtained. The important quantity is (d-z), and a process which involves an extreme degree of refinement in the determination of the smaller term z, and ignores the practical conditions which govern the larger term d cannot well be defended as being a necessary part of the work of calculation of the strength of an actual reinforced beam. Mr. Brown is further inclined to doubt whether the law of variation of the modulus of elasticity for concrete in compression, and the actual values of this modulus, are sufficiently definite to completely justify the refined calculations to which reference has been made. The value of the modulus of elasticity for different concretes may be fairly well established, the law of its variation is less certain, and, in view of the variations in quality of the component parts of concrete and the conditions of practice under which it is made and laid, he believes there is reasonable room for doubting whether the ultimate strength, modulus of elasticity, and the law of its variation can be known to within perhaps 20 per cent.

The ratio E_c / E_s is principally of interest in the theoretical determination of the position of the neutral axis. Take the formula $x^2/(1-x)=2Ac/bd$ for the position of the neutral axis, on the assumption of linearity of stress across the section. Put $A/bd=0.01$ $=1$ per cent. reinforcement. Suppose E = 2×10^6 lb. per square inch, and $E_s=30\times10^6$ lb. per square inch, so that $c=15$; the equation gives $x=0.42$. If E_c / E_s $=0.1$, or $E=3\times10^6$ lb. per square inch, then $x=0.36$. Hence in a beam having a depth of 10 in. to the centre line of the reinforcement, the neutral axis is 4.2 in. from the outer compression layer, if $E=2\times10^4$ lb. per square inch; and 3.6 in. from that layer, if $E=3\times10^6$ lb. per square inch.

The arm of the resisting couple is therefore 10—4.2/3 = 8.6in. in the former case, and 10—3.6/3 = 8.8in. in the latter case, a difference of some 2½ per cent., so small as to be completely discounted by an error in setting of the rods.

Fire Tests.

Simultaneously with these tests four beams and four cubes were placed in a furnace of the metallurgical laboratories of the university, and gradually heated from the ordinary room temperature to 1,250 degs. F. The heating was begun at 8.30 a.m. and reached the maximum at 3 p.m. the same day. The furnace was then allowed to cool slowly, and the beams were removed on the following day when the furnace could be entered. The beams were supported on firebricks so as to be inclined upward from the fire end of the furnace. The gases were thus equally distributed on their way to the flue. The reinforcement was uppermost and the firebrick supports about 2ft. from the ends of the beams, which were, for test, on 6ft. centres. On removal from the furnace it was evident that there was initial strain in the beams, for they were appreciably cambered, so as to be concave on the reinforcement side. All of them were more or less cracked when



SECTION THRO CORNICE AT 5TH FLOOR.

FIG. 6.—THE SELFRIDGE STORE. METHOD OF CANTILEVERING CORNICE.

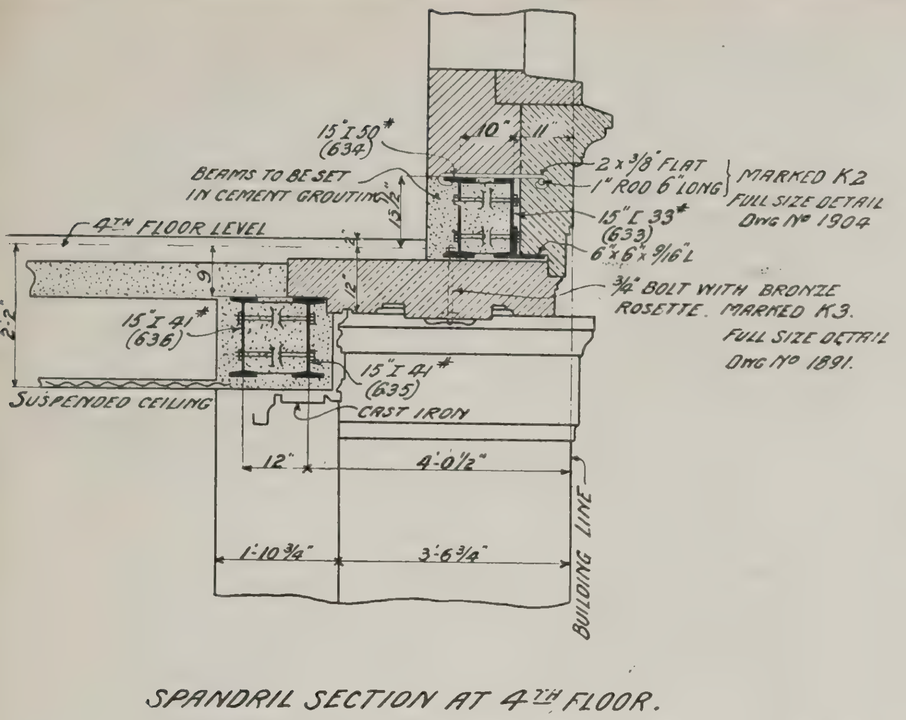


FIG. 4. THE SELFRIDGE STORE. SHOWING METHOD OF CARRYING STONEWORK ON THE STEEL FRAME.

taken from the furnace. When tested the breaking load varied from one-third to seven-tenths of beams of the same dimensions and same percentage of reinforcement which were not heated. In all the roasted beams the neutral axis was very close to the centre line of the steel, varying from 0.6 to 1.6in. in beams 8ins. deep.

The results of the tests of the roasted cubes indicated a marked reduction in the value of the compression modulus, an average value being about 125,000lbs. per square inch, against 2 to 3 million pounds per square inch for normal concrete. The average compressive strength, 1,560lbs. per square inch, was about 70 per cent. of that of normal concrete. The reduction in concrete modulus shows some reason for the fact that the neutral surface is so near the steel reinforcement. The position of the neutral surface is given by

$$k=\sqrt{p^2c^2+2pc}-pc.$$

on the assumption that the strain follows the linear law

$$c=\frac{E_s}{E_c}=\frac{30\times 10^6}{125,000}=240$$

$100\,p$ = percentage reinforcement. The average reinforcement in the roasted beams was 1.23 per cent. These values, if substituted in the above equation, give $k=1.0$. This would mean that the neutral surface was at the steel line, but the above values of E_c are necessarily only very approximate, and the calculation shows that the actual results of the beam tests check reasonably with those of the tests on the cubes. It is quite reasonable that the properties of the concrete in the cubes should differ somewhat from those of the concrete in the beams. In the latter case, heat must have been conducted to the interior of the beam by the metal rods, and the effect of the high temperature in a beam 6 × 8ins., with reinforcement, may well be different from the effect of the same conditions on 9-in. concrete cubes. A slight change of the ratio E_s / E_c would bring the value of k into agreement with the experiments.

Data of Tests of Reinforced Concrete Beams.

Beams.	Size.	Per cent. reinforced.	Age, days.	Maximum load, lb.	Construction in $M = cbd^2$.	Weight of beam, lb.	Weight of steel, lb.
Johnson :							
No. 1..	6x8	1.25	28	12,000	470	311	11.5 *a*
No. 2..	6x8	1.25	29	12,270	480	313	12.2 *b*
No. 3..	6x8	1.25	49	11,000	432	314	11.5 *a*
No. 4..	8x12	0.80	55	17,900	361	1,009	25.5 *c*
No. 5..	8x11¾	1.02	56	20,500	431	1,008.5	31.0 *b*
Kahn :		Net					
No. 6..	6x8	1.15	28	12,000	470	314	17.8 *b*
No. 7..	6x8	1.15	55	12,950	505	301	17.8 *b*
No. 8..	6x8	1.30	28	12,000	470	303	17.0 *a*
No. 9..	6x8	1.30	55	14,000	547	315	17.0 *b*
No 10..	6x7.5	1.24	28	10,000	452	292	17.8 *b*
No. 11..	6x7.15	1.30	56	11,530	580	282.5	17.8 *b*
No. 12..	8x12	1.25	28	23,600	475	1,050	56.5 *b*
No. 13..	x811¾	1.27	56	25,100	526	1,043	56.5 *b*
Ransome :							
No. 14..	6¾x9½	1.27	29	21,940	518	431	17.5 *a*
No. 15..	6x8	1.72	29	18,000	700	318	16.0 *a*

(*a*) Diagonal end failure. (*b*) Tension failure central third, compression above. (*c*) Tension failure central third.

The accompanying table gives the principal points in connection with the tests of the regular beams, which were not roasted. A perusal of the table shows that two of the

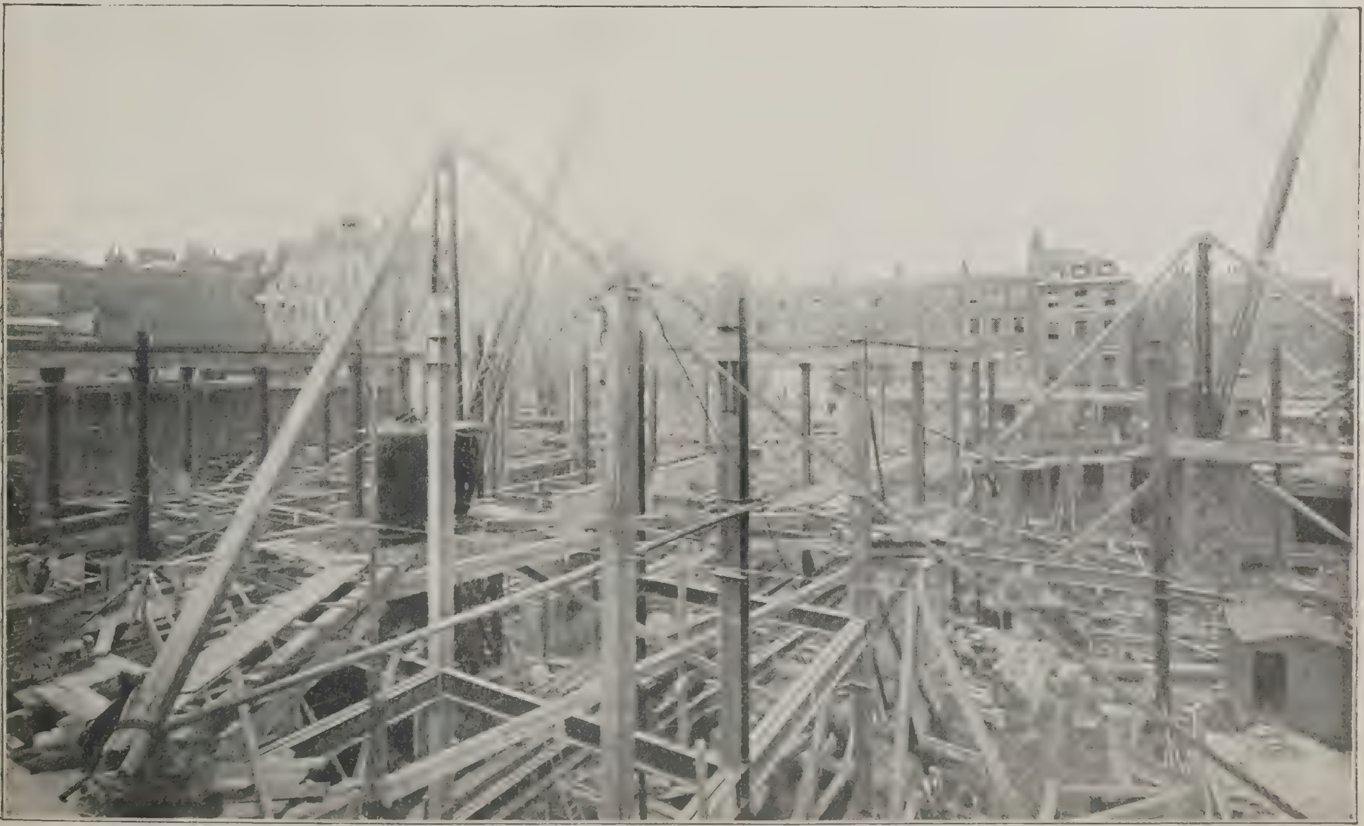


FIG. 8. THE SELFRIDGE STORE. ERECTION OF THE STEELWORK.

Johnson beams failed by diagonal cracking at the ends. In both these the centre bar of the three was bent up at 45 degs., leaving some portion of the beam near the supports without diagonal reinforcement. Beam No. 2 had a diagonal rod running to the support, and failed in the central third, at the highest load of the three 6 × 8-in. beams. Of the Kahn beams, only one failed by diagonal cracking at the ends. Both Ransome beams failed by diagonal cracking. In the case of No 14, the span, 6ft., was short compared with the depth of 9½ins., and the conditions were such as to induce excessive diagonal tension due to end shear. Ransome No. 15 was much more heavily reinforced than the other 6 × 8-in. beams, and carried a much higher load. Owing to the high yield point of the steel, and the heavy reinforcement, it was not surprising that diagonal end failure resulted. Both Ransome beams, therefore, may be regarded as being of proportions liable to result in diagonal end failure. A test made this year on a Ransome beam, 6ins. × 8ins. × 6ft., reinforced with two ½-in. rods, and having no diagonal reinforcement whatsoever, carried a maximum load of 16,000lbs. at the third points. The concrete was nearly thirteen months old. The failure of the above beam occurred by tension cracking within the load points and compression failure above. The ends, although having no diagonal reinforcement, remained perfectly sound. The percentage reinforcement was 1.15. The total weight of the beam was 312lbs.; steel, 10.81lbs. It may be said, therefore, that Johnson beams Nos. 1 and 3, and Ransome beams Nos. 14 and 15 were liable to end failure for special reasons. Of the eight Kahn beams tested, only one failed diagonally at the end.

Position of Neutral Axis.

		Depth of neutral axis from compression face in per cent. of depth.		
Beam.	Per cent. net reinforcement.	Average of experiments.	Theoretical $E=2\times 10^6$.	Theoretical $E=3\times 10^6$.
1....	1.25	47.0	45.5	39.2
2....	1.25	44.0	45.5	39.2
3....	1.25	48.5	45.5	39.2
4....	0.80	43.5	38.3	32.8
5....	1.02	42.0	41.8	36.0
6....	1.15	45.5	44.0	38.0
7....	1.15	51.0	44.0	38.0
8....	1.30	47.5	46.0	39.8
9....	1.30	48.0	46.0	3.98
10....	1.24	49.0	45.2	39.0
11....	1.30	48.5	46.0	39.8
12....	1.25	43.5	45.5	39.2
13....	1.27	47.0	45.7	39.5
14....	1.27	42.5	45.7	39.5
15....	1.72	49.5	50.5	44.0

An accompanying table enables a comparison to be made between the experimental position and that indicated by the analysis based on linear straining action and constant concrete modulus. The curves show that the position of the neutral axis varies in a given beam by as much as 9 per cent. of the depth. The value tabulated above is an average one. The concrete moduli given by tests on cubes were somewhat variable, and for that reason the table includes theoretical positions of the neutral axis for $E = 2 \times 10^6$, lb. per square inch and $E=3\times 10^4$ lb. per square inch. In most cases there is a rough agreement between the average experimental value, and the theoretical value corresponding to $E=2\times 10^6$ lb. per square inch. The results, however, indicate appreciable differences in the position of the neutral axis in the case of beams having the same net reinforcement, and support the view that since the actual position of the neutral axis is liable to such variations, any elaborate theoretical calculation of its position is out of place.

Messrs. Doulton and Co., Ltd., inform us that they have received the order for supplying the whole of the sanitary appliances for the new offices at the extension, Waterloo Station, London and South Western Railway. They announce also that the sanitary accommodation at the Imperial International Exhibition, Shepherd's Bush, which is necessitated by the requirements of the London County Council, has been placed in their hands by Mr. Imre Kiralfy.

HOW CEMENT IS MADE.

A party, numbering more than one hundred, composed of evening class students, teaching staff, and the principal, from the L.C.C. School of Building, Brixton, paid a visit, on a recent Saturday, to the works of the Associated Portland Cement Manufacturers (1900), Ltd., at Northfleet, Kent.

The party was conveyed in specially reserved electric cars from the railway station to the works, where the visitors were welcomed by Mr. C. J. Kean, in the unavoidable absence of the managing director, Mr. H. K. G. Bamber. In addition to Mr. Kean, there were several other members of the directorate, together with the secretary of the company, assembled to meet the visitors.

Under the guidance of Mr. Kean, the party were taken in the company's railway to the new jetty, which has recently been built of reinforced concrete by and to the designs of the company's own engineering staff. This jetty became necessary in order to provide greater facilities for shipping cement in consequence of the recently augmented output of these works, which now have a capacity for producing 1,000 tons of finished Portland cement per day.

The party continued by rail to the washmills, where it was divided into small groups, each under the care of a responsible officer of the company. The visitors here saw in operation the most modern method for the intimate admixture and reduction of the raw materials of chalk and clay with the addition of water.

The storage and mixing tanks were next visited, one of the largest holding 10,000 tons of slurry, as the mixture is called, sufficient for about 3,000 tons of cement. The material is here kept in continual motion by means of mechanical stirrers, thus preventing settlement and ensuring uniformity of composition.

The visitors were perhaps most interested in the modern rotary kilns, of which they saw sixteen in a battery, each kiln being a steel cylinder 120ft. or more in length and 8ft. to 10ft. in diameter. The slurry is pumped from the mixers to these kilns, into the upper end of which it is mechanically fed in definite measurable quantities. The axis of the cylindrical kiln being slightly inclined to the horizontal, the rotary movement, assisted by means of logitudinal baffle plates inside, aids the drying and decomposition of the slurry as it passes to the zone of heat at the lower end, where the fuel (pulverised coal) is injected by means of a steam blast. Here the process of calcination is completed at a temperature of about 3,000° Fah., and the clinker falls in a red-hot condition into the coolers in a stream of small pieces varying in size from a pea to a walnut. The burner or kiln operator showed how completely he could at once regulate the amount of slurry admitted to the kiln at the top end, the rate of rotation and consequently the speed at which the material travels down the kiln, and the quantity of pulverised coal injected, all of which were under his absolute control. There is practically no ash in rotary clinker, as at the great heat the pulverised coal is immediately gasified, and bursts into flame, and nearly all the ash or combustible matter is carried up the kiln by the draught and deposited in special dust-collecting chambers at the base of the chimney shafts, of which there are two 240ft. high. The rotary coolers connecting the kilns with the delivery hoppers and clinker trolleys for conveying the material to the grinding mills were next inspected. One could see the red-hot clinker dropping into the upper end of the inclined coolers, the internal action of which is similar to that in the kiln itself, except that the baffles or lifting angles extend practically the whole length of the cooler, and the clinker passing out at the lower end was quite cool, ready for the final process of grinding.

The pulverising is done by means of ball mills and tube mills. A sample of cement was shown as it issued from the ball mills, ground to a coarse powder; it then passes on to the inlet end of the tube mills, which are steel cylinders 26ft. long by 5ft. diameter, revolving on a horizontal axis; and the cement can be seen issuing from the opposite end ground to any degree of fineness by the percussive and abrasive action of the flint pebbles inside during the rotation of the mill. An interesting point at this stage was the action of the Bamber hydration apparatus, whereby, with a jet of steam, the pressure and quantity of which can be altered at will, the atmosphere in the tube mill is kept moist, and thus every particle of cement is subjected to superficial hydration, to the elimination of any free lime which might exist in the clinker; and at the same time the setting time of the finished cement can be regulated almost to any required degree. It was explained that all cement which went through this process was ready for immediate shipment and consumption as soon as the necessary tests had been made confirming the character of the material as in accordance with the requirements of the purchaser.

The chalk quarries on the company's premises were also visited. Here again it was noticed how expense and machinery are reduced to a minimum by taking advantage of the natural slope of the land.

On returning to the starting point, the party were invited to take tea with the directors and officials of the company, in the large hall of the Workmen's Institute attached to the works. During the tea a recital was given on the large organ by the company's organist. There was also a demonstration of cement testing and gauging by experts from the works.

After the tea, Principal Richards, of the L.C.C. School of Building, proposed a vote of thanks to the Associated Portland Cement Manufacturers (1900), Ltd., and to the officials of the company who had so courteously conducted the party. This was seconded by Mr. G. M. Rich, B.Sc., the representative of the Education Offices of the L.C.C., and was carried enthusiastically. Mr. C. J. Kean, replying on behalf of the A.P.C.M., was received with hearty applause, and apologised for the unavoidable absence therefrom of Mr. H. K. G. Bamber, managing director of the company.

The Westminster City Council has decided that all temporary awnings, are, in future, to be at last 8ft. above the pavement. The inconvenience to the public from the low height of awnings and of shops' blinds we have frequently drawn attention to.

* * *

The duty of preserving the architectural features of Paris has hitherto been conducted by the Ministries of the Interior, of Finance and of Fine Arts, working independently and often in opposition. The Prefect of the Seine has also a say in the matter. It has been decided to do away with this divided control and appoint a new ministerial committee to secure maintenance on uniform principles. The question of classing a number of well-known streets and squares as "monuments" will be considered soon by the new committee.

* * *

The slate trade continues in a depressed condition. The quantity of slates shipped at Carnarvon Port during last March shows an increase of 212 tons over March, 1908, which was a poor month; but the figures for the three months ending March this year, show a decrease of 1,465 tons. The quantity shipped from Carnarvon Town was under 1,000 tons for the three months. Mr. Ellis Davies put a question in the House of Commons as to the Royalties charged by the Office of Woods and Forests on slate quarries on Crown lands in North Wales. It is asserted that the Crown Royalties are between 2s 10d. and 3s. 5d. per ton, the average on quarries on private property being between 2s. and 2s. 6d. Mr. Hobhouse in reply said that the Royalties were charged as a percentage on the sums realised by the sale of the slates; consequently they rise and fall with the fluctuations of the market, and when prices are low the lessees get the benefit of an automatic reduction.

A GUIDE TO REINFORCED CONCRETE DESIGN.

The usual catalogue issued by trade firms says a great deal about the special manufactures it is designed to advertise, and contains very little about any subject from the general point of view that would be useful to the architect and engineer. We occasionally find tables and memoranda included that are to be found in many other reference books, but seldom do catalogues take the form of handbooks. The most notable exception to the general run of catalogues that we have seen is the catalogue of the "Lock Woven Mesh System of Reinforced Concrete," issued by Messrs. James H. Tozer and Son, Ltd. It is really a compendium of information on reinforced concrete, without regard to any particular systems, and, therefore, more in the nature of a book on the subject written for sale by a disinterested author. Though not exactly a text book, it would be valuable and instructive to the student, but its greatest value will be to the practising architect and engineer, for it is a sort of pocket-book on reinforced concrete specialist design, and comprises a full summary of the most approved methods of calculating the dimensions of reinforced concrete members of all kinds, and contains a remarkable amount of information in a small space, all of the most practical character, evidently compiled by an expert in the subject, who has not endeavoured to mystify and complicate the subject but to elucidate and show the most rational methods of design, and to provide short cuts that are used in the designing office to save time and labour and avoid mistakes. The methods of calculation are generally based upon the R.I.B.A. Report on Reinforced Concrete, but they go much further, and information is included on many parts of design not touched upon in that report. For instance, there are provided the following:—Standards for adequate superimposed floor loads; bending moments and shearing forces under beams, with different kinds of loading, and built-in or continuous over-supports; slabs supported on all sides, cantilevers and "mushroom" floors; double reinforcements; shearing stresses; column foundations; sewers, mains, culverts, circular reservoirs, and silos; arches; and temperature stresses. Much of the information on design is quite new, or conveyed in an original manner, and it is well illustrated by clear diagrams. The information on the design of arches—a complicated subject—is the shortest and most practical we have yet seen, and when the method is fully grasped and followed will save a great amount of time to the designer, for

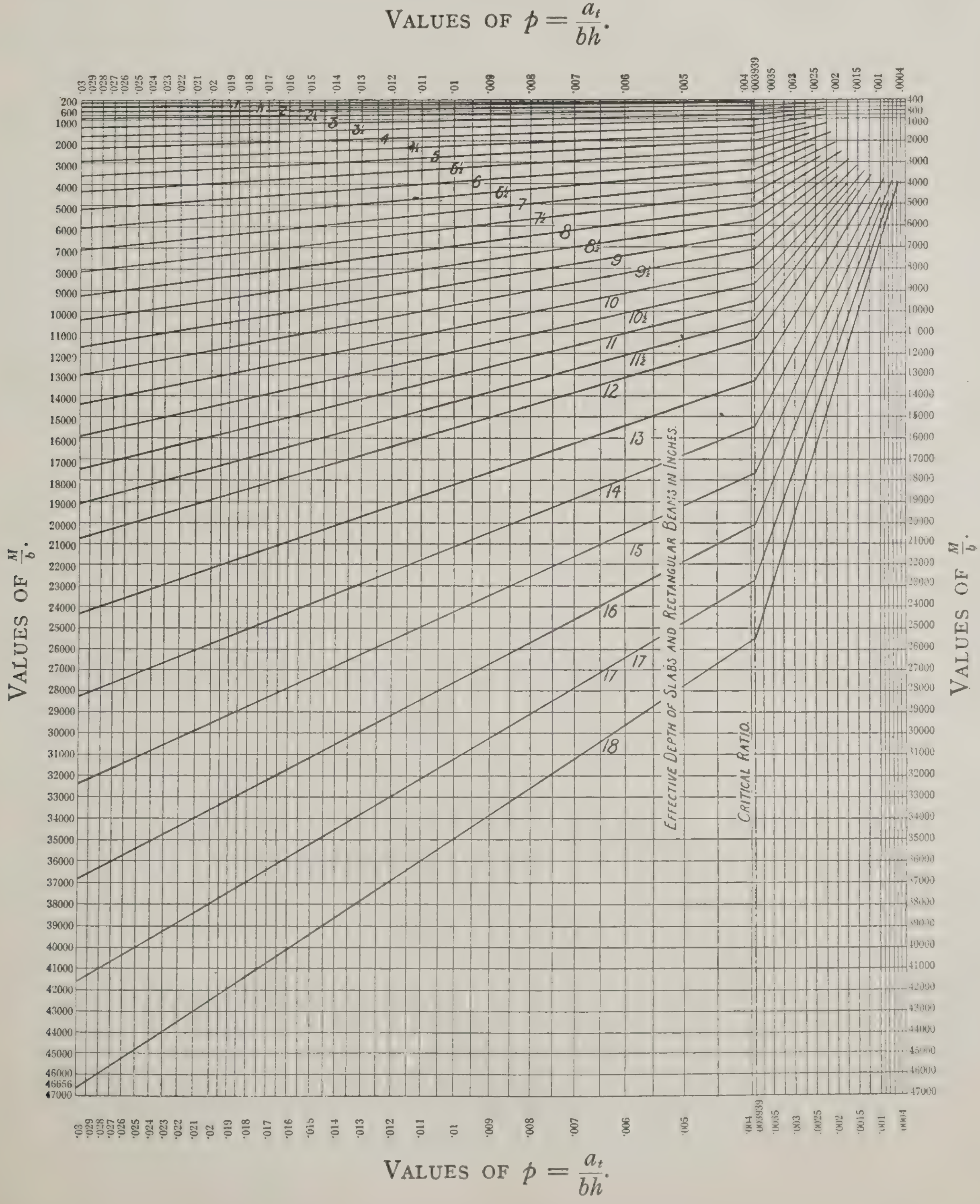


Diagram for calculating effective depth of Slabs and Rectangular Beams.

Steel = 22,000 pounds, Concrete = 600 pounds, only the necessary steps are recorded—the method is a rational one, and gives reliable results, whereas the design of reinforced concrete arches is too often empirical. We reproduce one of the diagrams included in the book for the saving of time in calculations; it is for high elastic limit steel and a strong broken stone or ballast concrete conforming to the R.I.B.A. standard, and although of general application is really designed to apply to Tozer's Lock Woven Mesh, which is made of drawn steel wire. This diagram is suitable for use in designing floor slabs, or rectangular beams, and may be used quite well for T-beams also. It is only necessary in using it to calculate the bending moment for dead and live loads (assuming a depth to start to obtain the former) in lbs., and divide same by the breadth (12ins., say, in the case of a slab). Then read along the line corresponding to this value of $\frac{M}{b}$ until any suitable depth is arrived at, remembering that the nearer this is to the critical ratio the more economical it will be; we then read vertically up or down to find the ratio p; we then find the sectional area of the piece by multiplying the thickness by the breadth, and finally multiply by the value of p, which gives us the sectional area of steel required. The depth must be increased by any protection required for the steel, *i.e.*, against corrosion and for fire resistance, say, ¾in. The symbols used on this diagram are as follows:—

M = bending moment in inch-lbs.
b = breadth or width of beam.
h = effective height or depth.
a = area of steel in tension.
p = proportion of area of steel compared to effective area.

Similar diagrams for ordinary mild steel and for both kinds of steel and coke-breeze or clinker concrete are provided, as well as a novel diagram for immediately finding the best section of Lock Woven Mesh for the purpose. The catalogue also opens with a most interesting and authoritative short history of the invention and progress of reinforced concrete, in which the system is traced from Roman times to be rejuvenated again in 1830. At the end of the catalogue there are illustrations of various structures and ways and means of employing Lock Woven Mesh for various purposes, which are both useful and instructive. The descriptions here included are quite to the point, and not overloaded with flowery epithets. The standard meshes are given, with size of longitudinal and crosswires and spacing and weights of the sheet. Two methods of securing the wires at intersections are used, as shown in Figs. 1 and 2. There are also illustrations of buildings, in which Tozer's Lock Woven Mesh has been employed, and some diagrams for ascertaining the cost of stone, gravel, and cement in mixtures of concrete of different proportions customary in practice. All who are interested in the subject of reinforced concrete should unquestionably study this catalogue carefully, and no doubt many will use it regularly in the work of design.

STRESSES IN ROOF TRUSSES.

By Max Am. Ende.

Continued from page 273, No. 713.

Introducing now into the system AN, containing n bars, the redundant bar AD and let its extensibility be $m' = \frac{l'}{a' E'}$, its stress, as yet unknown, S', so that its extension be $\Delta l' = S'm'$, then, regarding S' as an additional force, we can determine in the usual way the n stresses σ' due to the unit of S' (some of which will be = 0), and we have $r+1$ forces and an additional d, which, however, is in the opposite direction to that of the force.

$$d' = -\Delta l' = -S'm'.$$

Equation (3b) will then be as follows:

$$\Sigma^n_0 \sigma' S' (\sigma_1 F_1 + \sigma_2 F_2 + \ldots + \sigma_r F_r + \sigma' S')\, m_x = -(S')^2 m'. \qquad (7)$$

Dividing by S' and putting the stress in the bar x from all forces F. viz.:

$$\sigma_1 F_1 + \sigma_2 F_2 + \ldots + \sigma_r F_r = R_x \qquad (8)$$

we have

$$S'm' + \Sigma^n_0 (\sigma')^2 S' m_x + \Sigma^n_0 \sigma' R_x m_x = 0 \ (9).$$

Introducing into the system another redundant bar KL of the extensibility m'' and with the unknown stress S'' we should have the two additional members $\sigma'S'$ and $\sigma''S''$ in the parenthesis of (7) and there would be two equations (9).

In the same way we can extend equation (9) to any number of redundant bars. For three redundant bars the three equations will be as follows:

$$\left.\begin{aligned} & S'm' + \Sigma^n_0 (\sigma')^2 S' m_x \\ & \quad + \Sigma^n_0 \sigma' \sigma'' S'' m_x + \Sigma^n_c \sigma' \sigma''' S''' m_x \\ & \quad + \Sigma^n_0 \sigma' R_x m_x = 0 \\ & S''m'' + \Sigma^n_0 \sigma'' \sigma' S' m_x \\ & \quad + \Sigma^n_0 (\sigma'')^2 S'' m_x + \Sigma^n_0 \sigma'' \sigma''' S''' m_x \\ & \quad + \Sigma^n_0 \sigma'' R_x m_x = 0 \\ & S'''m''' + \Sigma^n_0 \sigma''' \sigma' S' m_x \\ & \quad + \Sigma^n_0 \sigma''' \sigma'' S'' m_x + \Sigma^n_0 (\sigma''')^2 S''' m_x \\ & \quad + \Sigma^n_0 \sigma''' R_x m_x = 0 \end{aligned}\right\} (10)$$

Putting here $\sigma''' = 0$ we get the two equations for two redundant bars.

[Note 0=nil.]

Example 1.

Fig. 4 is a system of the same type as Fig. 1, but having only 15 instead of 37 necessary bars it is better suited here. AB is the redundant bar. Any one of the bars 1 to 9 might be regarded as redundant instead of AB, as the system would then also be stable, but AB is preferable on account of its symmetrical position. Equation (9) has to be used. The two sums consist each of 15 members, which are stated in the following Table I. Assuming the material to be throughout the same, E, in $m = \frac{l}{aE}$, will be constant. Changes of length, if calculated, will be found in feet as l is stated in feet.

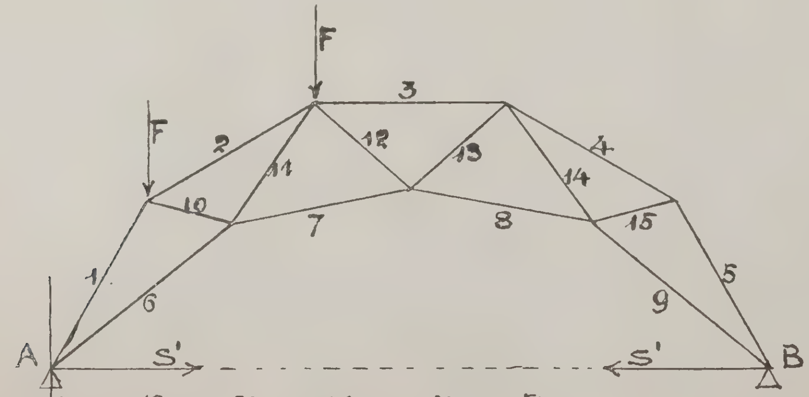


FIG. 4.

Table 1.

Bar No.	l (feet)	a (inch²)	m	Rx	σ'	$(\sigma')^2 m_x$	$\sigma' R_x m_x$
1	20	8	2·5	−3·15	+1·63	+5·64	−12·83
2	20	8	2·5	−2·87	+2·16	+11·65	15·49
3	20	8	2·5	−1·94	+1·30	+9·02	−9·21
4	20	8	2·5	−1·38	+2·16	+11·65	−7·58
5	20	8	2·5	−1·06	+1·63	+5·64	−4·32
6	23·3	4	5·8	+2·08	2·33	+31·50	−28·11
7	19·0	4	4·8	+2·14	−2·25	+24·29	−23·11
8	19·0	4	4·8	+1·23	−2·25	+24·29	−13·28
9	23·3	4	5·8	+0·69	−2·33	+31·50	−8·89
10	9·0	3	3·0	+0·95	−1·10	+3·63	−3·13
11	14·2	3	4·7	+0·62	−0·73	+2·50	−2·13
12	13·5	3	4·5	−0·16	−0·67	+2·02	+0·48
13	13·5	3	4·5	+1·06	−0·67	+2·02	−3·19
14	14·2	3	4·7	−0·05	−0·73	+2·50	+0·17
15	9·0	3	3·0	+0·70	−1·10	+3·63	−2·31
AB	74·6	6	12·4	—	—	—	—
			$\times\frac{1}{E}$	×F		$\times\frac{1}{E}$	$\times\frac{F}{E}$
					$\Sigma^n_0 =$	$+171{\cdot}48\frac{1}{E}$	$-132{\cdot}92\frac{F}{E}$

Then equation (9) will be:

$$\frac{12{\cdot}4S'}{E} + \frac{171{\cdot}48S'}{E} - \frac{132{\cdot}02F}{E} = 0$$

$$183{\cdot}88S' = 132{\cdot}92F$$

$$S' = 0{\cdot}723F.$$

The stress in any bar X will then be $R_x + S'_x \sigma'_x$, for example:

$$S_9 = +0{\cdot}69F - 2{\cdot}33 . 0{\cdot}723F = -0{\cdot}99F.$$

This is for the load assumed in Fig. 4. If the other two junction points are equally loaded (total load) each bar will receive an additional stress R_x equal to that of the bar opposite to it so that $\Sigma\, \sigma^1 Rm$ is doubled.

$$183{\cdot}88\ S' = 265{\cdot}84;\ S' = 1{\cdot}446\ F.$$

$$S_9 = (2{\cdot}08 + 0{\cdot}69)\ F - 2{\cdot}23 . 1{\cdot}446F;$$

$$S_9 = -0{\cdot}45\ F.$$

The present example may be used to illustrate the artificial adjustment of stresses. If for any practical reason it is required that under any loading with F on a point the bar S_9 should never be in compression, then its greatest value $S_9 = -0{\cdot}99\ F$ should become nil, and we have the condition: $S_9 = 0 = +0{\cdot}69\ F - 2{\cdot}33\ S'$; $S' = +0{\cdot}3\ F$. Therefore, as the structure is erected without initial strain, S' would be $(0{\cdot}723 - 0{\cdot}3)\ F = 0.423F$ too great; *i.e.*, the bar AB should be $\Delta l' = 0{\cdot}423Fm'$ longer. With $m' = \frac{12{\cdot}4}{E}$ (see Table I.) and assuming $F = 24$ tons and $E = 12{,}800$ tons we have: $\Delta l' = \frac{0{\cdot}423 . 12{\cdot}4\ 24}{12800} = \frac{126}{12800}$ ft. = about ⅛ inch. In order to fit this bar, being ⅛ inch too long, into the structure we should loosen the supporting wedges and perhaps load the structure artificially until there is room to put it in.

(*To be concluded.*)

A well-illustrated catalogue of sanitary fittings has been issued by Messrs. John Jones (Chelsea), Ltd., Carlyle Works, Church Street, Chelsea, S.W., showing various descriptions of baths, lavatory ranges, bracket and pedestal lavatories, spray lavatories, various types of closets, etc. Among several special features is the "Denman" pedal spray lavatory, as supplied to the Metropolitan Asylums Board for isolated cubicles, and awarded a bronze medal by the Royal Sanitary Institute in 1907.

* * *

Messrs. Mark H. Judge and Sons (Mr. Mark H. Judge and Mr. Max Judge), by reason of the death of their late partner, Mr. Leonard Judge, have now taken into partnership Mr. Guy Widfrid Hayler, and as from May 1st the firm will be conducted under the title of Mark H. Judge, Son, and Hayler, architects, sanitary surveyors, and engineers. Mr. Hayler is a nephew of Mr. Mark H. Judge; is an architect and surveyor, a Member of the Royal Sanitary Institute, and a Member of the Institution of Municipal Engineers. For the last eight years he has been assistant to the borough engineer of the Corporation of Gateshead.

Federation News.

SHEFFIELD ASSOCIATION.

Secretary: Thos. Smith.

At the April monthly meeting of Sheffield Master Builders' Association Mr W. W Mears presided.

Previous to the meeting the committee met a deputation from the U.T.C. of Carpenters and Joiners, in reference to an allegation by the latter that on a large contract for the Sheffield Corporation there had been a breach of the fair wages clause.

After some discussion it was decided that the secretary of the M.B.A. should write to the contractors (who are not members of this association) for their version of the matter, and assist as far as possible in adjusting it to the satisfaction of all concerned.—Since the meeting, the contractors have met representatives of the operatives, but the result of their negotiations has not yet transpired.

The treasurer's statement showed the finances of the association to be in a satisfactory state, and amongst the accounts passed for payment was a first instalment of £30 on account of levy payable to the Yorkshire Federation for the current year.

The accounts of the annual dinner were presented by the secretary, and showed a loss of over £30, which, as is customary, had been paid by the president (Mr. W. W. Mears), to whom a most hearty vote of thanks was accorded. Some comment was made about the largeness of the sum, and at a later stage of the meeting it was suggested that at least a portion of the expense ought to be borne by the association's funds, but the president intimated that he was pleased to continue the precedent of his predecessors in the office, and the fact that the dinner was a great success was the greatest complimentary vote of thanks they could give him.

Mr. Chas. Boot called the attention of the association to an alteration in the City Council's form of contract for small alteration and repair jobs. It had previously been the practice of the corporation to issue a short form of contract for these jobs, but now the city architect's department were requiring the corporation's ordinary form of contract, such as was required for jobs of considerable magnitude. The association saw no reason for the alteration; and, moreover, the ordinary form of contract was obviously inapplicable, and never intended for such jobs. The ordinary form contained a clause whereby ten per cent. of a contract was retained for 6 months, and a balance of 5 per cent. of this for 12 months, whereas these small jobs had previously been settled up at the end of 3 months. The ordinary contract also required work to be kept in repair for 12 months, and it was most unreasonable that such a clause should apply in the case of, say, a pitch-pine partition put in hurriedly at the request of the education department at holiday time, as no amount of precaution at such short notice could prevent a certain amount of shrinkage, for which the contractor could not reasonably be held to be responsible. A further provision was that the alteration should be insured by the contractor, whereas the association thought this should be included in the insurance of the building, as in case of two insurances (one for a very small amount, being the amount of the contract for alteration) existing there might be costly litigation as to responsibility for an outbreak of fire and differences as to apportionment of liability. A further point was that it would be most inconvenient for balances to remain on small jobs for a period of 12 months. After a lengthy discussion the secretary was instructed to write to the city architect suggesting that a deputation from the association should meet him. Since the meeting a deputation has been favourably received by the city architect and town clerk, and it has been agreed that all jobs of not more than £100 shall be settled up in three months. Some further concessions are still in negotiation.

The president said that he and Mr. Sivil had attended a meeting of the Chamber of Commerce, and felt sure that the inclusion of members of the association on the committees inaugurated for the discussion of builders' questions would be productive of good to the association and the building trade of Sheffield. Mr. Sivil supplemented the president's remarks with a *resumé* of the business transacted by the committee. It was the regulations the City Council had inaugurated which had in the main occupied their attention, and it was a moot point as to whether the council had power to enforce regulations which had not received government sanction. These regulations in regard to projections affected them very seriously as builders, not only in cases where they built up to the street line, but where there was a set-back. In regard to bay windows, these regulations prescribed that a projection must not exceed 4ins. per foot set-back, so that a set-back of 8ft. gave a projection of only 2ft. 8ins. That seemed exceedingly small as a maximum, and the committee suggested at least 5ins. or 6ins. With regard to area lighting, nothing was allowed in the street line beyond an ordinary cellar grate 12ins. by 14ins. This was really most ridiculous, and would seem to presume that the authorities concerned had nothing more in mind than the lighting of a coal cellar. He could assure his fellow members that the committee of the Chamber of Commerce were quite in agreement with the requirements of practical builders, and would be prepared to back the suggestions of the delegates of the Master Builders' Association. They were now awaiting a communication from the City Council before proceeding further.

The secretary said that he had not received any further communication from the Builders' Merchants Association in regard to the preferential terms which had been proposed, and he was instructed to write again. (Since the meeting a conference has been held between the two associations, and the result will be reported to next meeting).

It was decided to purchase a sufficient number of copies of the Federation directory to supply each member of the association with a copy.

Attention was called to the serious illness of Mr. A. Mastin, late treasurer of the association, and a resolution was unanimously passed instructing the secretary to convey to him the sincere sympathy of the association, and express the hope that he would soon be restored to his usual health. The secretary was also instructed to send letters of condolence to Mrs. A. Bradbury and Mrs. W. J. Tune, expressing the sympathy of the association on hearing of the deaths of Mr. Bradbury and Mr. Tune, both of whom were old members of the association. A further letter of sympathy was ordered to be sent to Mr. G. E. Powell, an ex-president of the association, in reference to the serious illness of Mrs. Powell.

REDDITCH ASSOCIATION.

Secretary: F. Turner.

At the annual meeting of the Redditch Master Builders' Association, a vote of thanks was accorded to the president and other officers for their services during the past year. Mr. Henry James Surman was appointed president and Mr. Thomas Huins vice-president for the ensuing year.

One new member was admitted to the Association.

Mr. Arthur George Avery was re-appointed treasurer of the association for the ensuing year. Twenty-three applications were received for the appointment of secretary, and, after a ballot, Mr. Fred Turner, of 185, Mount Pleasant, Redditch, was appointed.

A further meeting of the association was held on April 30th, at which Mr. Surman presided, and welcomed Mr. Turner as the secretary of the association.

The secretary submitted to the meeting the minutes of a meeting of the Midland Conciliation Board, held on April 6th last, at which was considered a notice of the operative masons, that the following be added to the working rules, namely:—"That piecework be not allowed, and no worked stone, or part-worked stone to come into the district from a lower paid district." The Board declined to agree to the proposition, and this association agreed with the decision of the Board.

At the annual meeting of the Redditch Urban District Counciy, held last month, Mr. Thomas Huins was appointed chairman and Mr. Henry James Surman vice-chairman of the Council. Both these gentlemen are members of the association.

BARNSLEY ASSOCIATION.

Secretary: S. Wigham.

The April meeting of the Barnsley Federation of Building Trade Employers was held at the King's Head Hotel, Barnsley, the President (Councillor J. Haigh) occupying the chair.

Minutes of the previous monthly meeting were confirmed.

The report of the Finance Committee of the Yorkshire Federation was submitted by the secretary and approved.

The report of the last Yorkshire meeting, held in Huddersfield, was submitted by the president.

A discussion took place on the proposed agreement between contractors and sub-contractors *re* the payment of moneys from the contractor to his various sub-contractors on public contracts.

The delegates to the Yorkshire Federation were instructed to submit certain recommendations *re* agreement at the next meeting of the Yorkshire Federation.

The inter-trading rule (continued) again was the cause of an animated discussion, and after its several vicissitudes was ultimately cast into oblivion for the present in favour of the Barnsley rule. It will, however, at an early future date, emerge from its retirement in a greatly strengthened condition, and its success cannot be delayed much longer.

BARNOLDSWICK AND DISTRICT ASSOCIATION.

Secretary: J. C. Addyman.

A special meeting of the Barnoldswick and District Master Builders' and Kindred Trades Association was held at the Liberal Club, Barnoldswick, on Tuesday evening, April 20th. The president, Mr. Edward Smith, occupied the chair, and there was a good attendance of members.

The minutes of the previous meeting having been read and approved, a discussion took place as to the advisability of appointing a collector of subscriptions who would attend personally upon members to receive subscriptions where necessary, and it was eventually resolved that a collector be appointed, and a committee was formed to see likely persons to take the appointment.

Alteration of rule was discussed, and the matter dealt with.

It was resolved that the May meeting of the Yorkshire Federation, which had been arranged should take place in the district, be postponed as requested by the Yorkshire Federation secretary, and that a fresh date be decided upon at the next meeting.

It was decided to give certain builders invitation to join the association, and to forward them full particulars of advantages to be derived through joining.

The question as to the annual outing was discussed, and a small committee was appointed to obtain information on likely places suggested, they to report at next meeting.

Arrangements were made for a meeting of plumbers at Earby to settle price lists and make working rules.

The monthly meeting which took place on Tuesday evening, May 4th, was at first presided over by Mr. T. Waite, vice-president, and afterwards by Mr. E. Smith, president, who were supported by a very large attendance of members.

The minutes of the previous meeting having been read and approved, correspondence was read by the secretary and considered.

The report of the annual outing committee was given, and after some discussion it was unanimously resolved that the Dukeries be visited on Tuesday, May 25th. A small committee was appointed and empowered to make all necessary arrangements for the outing.

Discussion followed as to further invitation to be given to Yorkshire Federation to visit the district, and it was resolved that they be invited to fix their June meeting for this district. The committee appointed to see likely persons to take position as collector gave their report, and it was resolved that Mr. H. Pye, of Barnoldswick, accountant, be appointed.

SUNDERLAND AND DISTRICT ASSOCIATION.

Secretary: W. H. Hope, Solicitor.

A meeting of the Executive Council of Sunderland and District Association was held in the Board Room on Tuesday, April 27th, Mr. Robt. J. Huntley in the chair.

The minutes of the Executive Council meetings held on March 2nd, 1909, which had appeared in the "Builders' Journal," were read, and were signed as correct.

The secretary reported that a complaint had been received from the operatives that a certain firm that had come from another district were not complying with the local working rules. The matter was taken up by him, and eventually a meeting was held with the operatives, when the firm agreed to conform to the local working rules.

A notice of alteration to the winter working hours has been given to the joiners, and a counter proposal has been received.

As the joiners were to be present later to discuss the alterations, it was resolved, on the proposition of the president, seconded by Mr. James McMillan, "That this association adhere to the proposals put forward by the employers, and, failing any agreement being arrived at, that the question be placed before the Conciliation Board, on the understanding that the other trades can be induced to join in the reference, so that the hours may be kept uniform for the different trades."

The estimated income and expenditure for the current year were carefully considered, and, on the proposition of Mr. F. W. Ranken, seconded by Mr. R. Swan, it was resolved "That the subscription for the current year be the same as last year, viz., at the rate of 3s. for each £100 paid in wages, and that the minimum subscription for all members be 21s."

The question of serving formal notice for alteration of the winter working hours of the stonemasons was discussed, and it was resolved to serve upon them a similar notice to that served upon the joiners—the notice of alteration to refer only to fixers, wallers, and all masons attending upon them.

A draft fair wages clause was considered, along with suggested amendments received from the operatives, who had inserted the words. "trade union" before the words "rate of wages." The association recommended that those words be objected to, and the following be the clause: "That the contractor, in carrying out this contract, shall pay the rate of wages as agreed upon by the associations of the employers and societies of the workmen in the district where any work for this contract is being carried out." The operatives also suggested "That in the event of any breach of the contract the building owner shall reserve the right to determine the contract." The employers decided to recommend a penalty of £5 for each offence.

Votes of condolence were passed with the respective families of the late Mr. J. B. Scott (a past president) and Mr. T. P. Shaftoe, and with Councillor R. Hudson, who recently lost his wife.

Minutes of a meeting held between the association and the Joiners' Society, in the Board Room, on Tuesday, April 27th, Mr. Robt. J. Huntley in the chair:—

The chairman intimated that the meeting had been called to consider the question of the alteration of the winter working hours, formal notice of which had been served upon the joiners as follows:—(b) From November 8th until November 20th (both inclusive) all men shall commence work at 7 a.m. and cease at 4.30 p.m. (instead of 5 p.m.), with half-an-hour for breakfast and one hour for dinner, except on Saturdays, when work shall cease at 12 noon, with the usual half-hour for breakfast, making a total of 44½ hours per week (instead of 47). (c) From November 21st until January 31st (both inclusive), all men shall commence work at 8 a.m., and cease work at 4 p.m, with no time allowed for breakfast and one hour for dinner, except on Saturdays, when work shall cease at 12 noon, making a total of 39 hours per week. (d) From February 1st until February 20th (both inclusive), all men shall commence work at 8 a.m. and cease work at 4.30 p.m., with no breakfast time, and one hour for dinner, except on Saturdays, when work shall cease at 12 noon, making a total of 41½ hours per week. The chairman gave the reasons why the changes were sought.

The operatives replied that they could not entertain the employers' proposals, as they were too drastic, reducing the hours in midwinter period to 39 and a wage of 30s. 1d.; and they were of opinion that any alterations were unnecessary, and that the working rules as they now stand are all that could be desired. They had given counter-notice as follows:—(c) That November 21st be deleted, and December 5th inserted. (d) That February 20th should read February 6th. The intention is to work a fortnight longer at the beginning of the winter period, and shorten the winter period by a fortnight.

Considerable discussion ensued upon the matter, and ultimately the operatives withdrew from the room, so that both parties could confer privately together. On their return, on the proposition of the chairman, seconded by an operative, it was unanimously resolved, "That this meeting be adjourned, and that the bricklayers be invited to attend a joint meeting of the association and the bricklayers' and joiners' societies on May 18th."

The question of a draft fair wages clause was considered, and several alterations were suggested, particularly with respect to the wages, penalty, and strike clauses. It was agreed that certain amendments be adopted, and, when drafted by the employers' secretary, be submitted to the operatives for their approval.

Coming Events.

Thursday, May 27.

INSTITUTE MEMBERS' CLUB. — Monthly Meeting in smoking room, R.I.B.A., 6 p.m.

THE CONCRETE INSTITUTE, ROYAL UNITED SERVICE INSTITUTION, WHITEHALL, S.W.—General Meeting: Mr. H. K. G. Bamber, F.C.S., on "The Setting of Portland Cement and Methods of Regulating the Same," 8 p.m.

SOCIETY OF ARCHITECTS, Staple Inn., E.C. —Whitsuntide Excursion to Kent.

Saturday, June 5.

EDINBURGH ARCHITECTURAL ASSOCIATION, 117, George Street.—Visit to Glasgow.

Monday, June 7.

SOCIETY OF ENGINEERS, Royal United Service Institution, Whitehall.—Ordinary Meeting.

Thursday, June 10.

PAINT AND VARNISH SOCIETY, St. Bride's Institute, E.C.—Mr. M. B. Blackler, Ph.D., on "The Use and Abuse of Driers."

Thursday, June 10—Saturday, June 12.

ASSOCIATION OF WATER ENGINEERS, 54, Parliament Street, Westminster.—Fourteenth Annual General Meeting, Durham.

Saturday, June 19.

EDINBURGH ARCHITECTURAL ASSOCIATION, 117, George Street.—Visit to Dunfermline. Leader, Mr. Thomas Ross, F.S.A. Scot.

Insurance.

Subscribers to "The Builders' Journal" are entitled to a Free Insurance for £500. Every subscriber should apply for this, sending a postcard with the name of the newsagent with whom the order has been placed. Subscribers can also obtain a General Accident and Sickness Insurance (the "Lighthouse" policy) at a reduced premium, which includes the Annual Subscription to this Journal. A pamphlet giving full particulars can be obtained free on application.

Free £500 Accident Insurance Coupons have been sent to the following:

H. M. B. (Harrow), C. O. (Broughty Ferry), H. C. P. (Armagh), J. F. D. (Pontefract), J. E. (Workington), G. F. (Duns), G. K. (Birmingham), G. H. L. (Leicester), W. E. M. (London, N.), F. E. P. (New Brighton), G. H. L. (Hornsey Rise), C. C. D. (Weston-super-Mare), A. E. W. (Newport, Salop), G. T. (Kirby-in-Furness), J. J. C. (Middleton), T. S. M. (Maryport), W. B. (Carlisle), G. F. B. (Spitalfields), J. W. R. (London, E.C.), R. H. F. (Hull), L. J. F. (Prestwich), A. S. S. (London, W.C.), C. S. M. (Chelsea), H. H. (Rochdale), W. B. (Derby), T. R. South Yardley), R. T. (Southport), K. H. R. (Stroud), W. T. (Bensted Alton), A. J. H. (Muswell Hill), C. W. L. (London, E.C.), H. O. (Rochdale), T. C. M. (Lower Edmonton), R. G. H. (Glossop), S. H. D. (Dublin), A. B. (Paddington), W. T. G. (Birmingham), J. G. C. (Falkirk), S. D. (Shepherd's Bush).

TANK ROOF TO FACTORY 190 ft. by 57 ft.

The Chain Concrete Syndicate.

Constructional Engineers in Reinforced . . Concrete. . .

The most complete system in existence.
Every Member, Tension or Shear, RIGIDLY FIXED.
No Loose Bars to be misplaced during Concreting.

Fireproof Floors, Flat Roofs, Reservoirs, Culverts, Bridges, etc.

Write for Pamphlet—

1, Basinghall Square, LEEDS, and Carlton Street, CASTLEFORD.

"Are You a TRAINED Man?
THAT is the QUESTION!"

—the question which every employer asks when he interviews an applicant for any post above the routine grade. On the answer you can give to it turns the possibility of your securing a better paid position than the one you now occupy.

You *want* to enjoy a better position; to secure progressive promotion; to ensure a future of success and happiness instead of an eternal round of drudgery.

Determine, then, without delay, to get the necessary training through the International Correspondence Schools.

The I.C.S. system of training men *for* their work while *at* their work provides the precise means you need to qualify for a good position. You study at home, by correspondence, just as and when convenient. You make the fullest use of your leisure —wasting no time travelling to and from classes. You are kept on sound, practical salary-raising lines of study all the time.

Thousands of men and women have proved the £ s. d. value of the I.C.S. courses during the 17 years our institution has been established. Here is typical testimony:—

"Bermondsey, London.

"I owe so much of my success in business to the thorough teaching and study of the Instruction Papers in my Course, that I cannot find words to describe my praise of the Schools. Since I completed the Drawing Course I have been able, for over six years now, to follow the most important part of my trade as mechanical engineer, as designer and draughtsman for large general and manufacturing engineers. Since becoming a student *my salary has been vastly increased*—the information obtained from the Mechanical Electrical Course being the cause.

"(Signed) G. W. Torr."

We will give you not only just such efficient training in your chosen line, but we will stand behind you with our

"STUDENT'S AID DEPARTMENT."

This department is in close touch with employers in every district, and devotes its entire attention to assisting I.C.S. students in the matter of employment by introductions, recommendations, &c. Let us send you full particulars of this valuable service. Mark the coupon or write us about any other career—TO-DAY

83

Registrar, INTERNATIONAL CORRESPONDENCE SCHOOLS, Ltd.,
(Dept. B.), International Buildings, Kingsway, London, W.C.

I am interested in your system of Technical Training and desire to increase my earning power. Please send me, post paid, free of charge, the Book covering the subject before which I have marked X on the coupon, and full information showing how I can succeed in same.

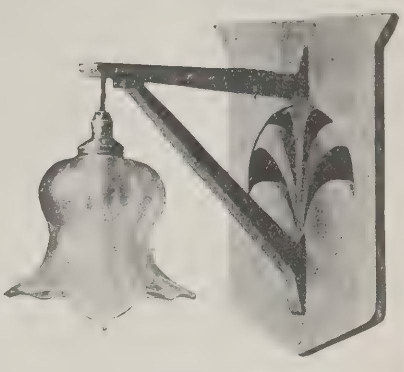
Architecture.
Mechanical Engineering.
Electrical Engineering.
Structural Engineering.
Gas Engineering.
Machine Shop Practice.
Sanitary Engineering.
Textiles.
Civil Engineering.
Analytical Chemistry.
Mining Engineering.
Steam Engineering.

Name .... *Age*
Street ....
Town .... *Occupation* .... 26/5. 09.

Residents of the following countries should address the respective I.C.S. branches:—Canada: Toronto. India: Fort, Bombay. South Africa: Cape Town. New Zealand: Wellington. Australia: Sydney. Italy: Naples. China Shanghai. P.I. Manila. Honolulu: Honolulu. Panama: Ancon. Bermuda Hamilton. Straits Settlements: Singapore. Porto Rico: San Juan Jamaica: Kingston. Mexico: Mexico, D.F. Argentine Republic: Buenos Aires.

ELECTRIC LIGHTING

Heating,
Bells,
Telephones.
FITTINGS.
Estimates Free.



A "Tredegar" Bracket.

Specialists in Temporary Electric Lighting and Power during construction of Buildings. ∴ We installed and maintained Electric Lighting and Power during the construction of the Baker Street & Waterloo Railway, the Piccadilly Hotel, etc.

TREDEGAR & CO.

HEAD OFFICE—56, Victoria Street, London, S.W.
BRANCH—St. Albans.
WORKS—Tredegar Works, Bow, E.

Telephone: WESTMINSTER 5907.

L. & C. HARDTMUTH'S
KOH-I-NOOR
PENCIL

is the most economical Pencil made. It lasts six times as long as an ordinary pencil. But it is the velvety smoothness of the lead that is the great charm of the Koh-I-Noor. There is no other pencil that nearly approaches its quality. The lead of the Koh-I-Noor is specially prepared by a perfected process which gives it a firmness yet delicacy of touch that cannot be imitated. The Koh-I-Noor is made in seventeen degrees to suit all pencil purposes.

Koh-I-Noor Pencils are **4d.** each, and **3s. 6d.** per dozen, everywhere. Of Stationers, Artists' Colourmen, Photographic Dealers, &c. Booklet free from

L. & C. HARDTMUTH,
12, Golden Lane, London, E.C.

KOH-I-NOOR
TRACING CLOTH

Is a stout and substantial cloth possessing every advantage for the drawing room. Its surface is smooth and clear, free from blotches. Does not tear or break. Is transparent enough for the finest work. Erasures may be freely made without causing the ink to run. Is excellent for giving impressions by process.

THE GREATEST SATISFACTION IN USING THIS SPECIALITY IS FOUND IN ALL DRAWING OFFICES.

Of Stationers, Artists' Colourmen, Photographic Dealers, &c.

L. & C. HARDTMUTH, 12, Golden Lane, London, E.C.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls	8	8
By post in the United Kingdom	10	10
By post to Canada	13	0
By post elsewhere abroad	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion	1s. 6d.
Each additional line	6d.
Three insertions*	3s. 0d.

This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER, S.W.

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Alnwick.—For the erection of workmen's dwellings, for the Alnwick Urban District Council. Accepted tenders:—

Charles Thompson and Son, mason work, £1,540.
Wilkin and Dickman, plumbers' work, £326 13s.
Joseph Purdie, slater and plasterer, £463 4s.
Jacob Smith, carpenter and joiner, £849 10s.
Frederick Hendmarsh, painting and glazing, £64 18s. 6d.

All of Alnwick.

Amlwch, Anglesey.—For rebuilding a new schoolroom, Wesleyan Chapel, Amlwch, Anglesey. Mr. F. Brindle, architect, Noira Street, Amlwch, and High Street, Llangefni:—

Evan, Hughes, Llandudno	£1,999
Owen Thomas,* Amlwch	1,180
Owens and Williams and Co., Amlwch Port	1,150
J. Thompson, Holyhead	1,136
Prytherch, Bodfordd, Llangefni	1,002

*Accepted.

Beverley.—Accepted for new Baptist church and schools at Beverley. Messrs. Garside and Pennington, Pontefract and Castleford, architects. Quantities by the architects:—

R. Potts, Beverley, Yorks., £3,540 18s.

Bootle, Lancs.—Accepted for erection of schools, for the Education Committee:—

Orrell Council school, H. Kelly and Brother, Walton, Liverpool, £9,099.

Secondary school for girls, T. Spencer, Aintree, Liverpool, £5,660.

Burnham, Bucks.—For the erection of a detached cottage, Britwell Road, Burnham, Bucks, for S. R. Christie-Miller, Esq., J.P. J. Wornell, architect, Slough, Bucks:—

Chas. Cox and Sons, Maidenhead	£312
H. D. Bowyer, Slough	295
Burfoot and Butler,* Slough	275

*Accepted.

Elland.—Accepted tenders for works required in the erection of three shops at The Cross, Elland, for the Halifax Joint Stock Banking Company, Ltd.—C. H. Petty, architect, 12, Waterhouse Street, Halifax. Quantities by architect:—

Crossley and Radcliffe, Halifax, excavators, masons, and bricklayers; J. W. Bulmer, Halifax, carpenter and joiner; J. Bancroft and Son, Halifax, slaters and plasterers; J. Holdsworth, Halifax, plumbing and heating; C. Nutton, Elland, painting.

Kirby Muxloe.—For the erection of a new elementary school at Kirby Muxloe, together with out-offices, drainage, and other works, for the Leicestershire County Council Education Committee. Mr. W. Brand, architect, 3, Bowling Green Street, Leicester. Quantities by Ernest G. Fowler, surveyor to the Committee:—

H. H. Garlick, Mowsley	£3,495	0	0
G. L. Martin, Market Harborough	3,485	10	0
B. Shipman, Ratby	3,322	5	0
King and Ridley, Lutterworth	3,296	0	0
E. Haycock and Sons, Great Glenn	3,290	0	0
P. Rourke, Lutterworth	3,260	0	0
Bradshaw Bros., Leicester	3,250	0	0
Griffin Bros., Hugglescote	3,250	0	0
Bowles and Son, Leicester	3,200	0	0
G. Toone and Sons, Anstey	3,174	0	0
W. F. Harding, Loughborough	3,172	17	6
F. Elliott, Leicester	3,157	0	0
G. Gurney, Leicester	3,137	0	0
A. Davey, Kirby Muxloe	3,126	19	0
Warburton & Trotter, Leicester	3,121	2	11
A. B. Moss, Coalville	3,120	0	0
F. J. Bradford, Leicester	3,057	0	0
W. Stanger, Leicester	3,032	0	0
F. Mason, Kirby Muxloe	3,012	0	0
A. Faulks, Loughborough	2,992	0	0
E. Fox, Leicester	2,988	15	10
F. Sleath, Rothley	2,980	0	0
F. Oldershaw, South Wigston	2,976	0	0
W. Potter, Blaby	2,974	17	0
A. E. Mould, Leicester	2,960	0	0
E. W. Garlick, Leicester	2,950	0	0

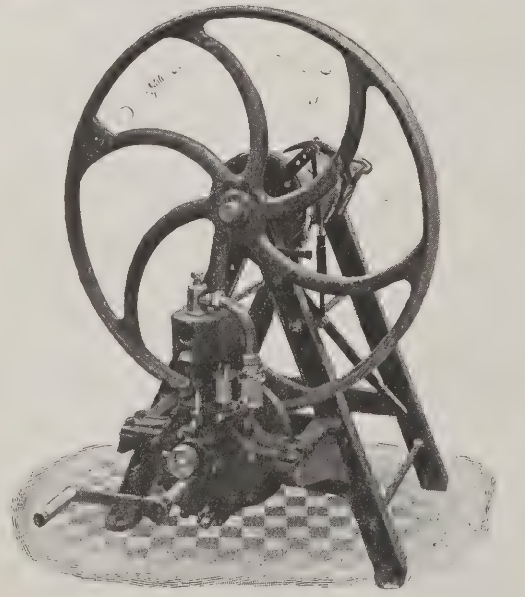
Preston-on-Tees, Yorkshire.—For extensions to All Saints' Church, Preston-on-Tees:—

J. Davison, Stockton	£453	0	0
Bastiman Bros, Middlesbro	445	0	0
G. E. Grey, Eaglescliffe	426	15	10
T. Boyd, Darlington	390	0	0
W. M. Doughty,* Yarm	384	3	6

*Accepted.

(*Tenders continued on page viii.*)

BROOM & WADE
ENGINEERS, LTD.
HIGH WYCOMBE.
POWER HOISTS for BUILDERS.
Always Ready for Use.
No Skilled Attention Required.



Driven by
PARAFFIN, PETROL or ELECTRIC MOTORS
2 cwt., 4 cwt. and 6 cwt. loads.
27, CLEMENT'S LANE, E.C.
Telegrams: "Inbrake, London." Telephone: 15133 Central.

The BUTTERMERE GREEN SLATE CO. LTD.
KESWICK, Cumberland.
Supply the finest Cumberland & Westmorland GREEN SLATES from their Celebrated—
Honister and Yew Crags Quarries, Cumberland.
Original Elterwater Green Quarries, Elterwater.
Coniston Green Slate Quarries, Tilberthwaite.
Lingmoor Quarries and Highfellside Quarries.
In the following colours:—
LIGHT SEA GREEN,
DARK SEA GREEN,
OLIVE GREEN,
and other Shades.
WESTMORLAND GREEN SLATES.
Manufacturers of Green Stonework for Flooring Tiles, Flagging, Heads, Sills, Mullions, Steps, Memorials, and other Architectural specifications.
Write for Prices, Samples and other particulars with List of Roofs covered to
Head Office—
KESWICK,
CUMBERLAND.
Telegrams—"Buttermere Slate, Keswick."
or to
52, QUEEN VICTORIA ST., LONDON, E.C.
Telegrams—"Khoro, London." Telephone—8206 Bank.

Reinforced Brickwork

Illustration shows test piece built with H.B. Reinforcement for Brickwork

H.B. Wire Reinforcement for Brickwork.

A Revolution in Building Construction.

Over 1,000,000, yards have been used within the last few months.

Write for Descriptive Catalogue.

Rd. JOHNSON, CLAPHAM, & MORRIS, Ltd.,

Striking Economy in space combined with the highest EFFICIENCY.

Buildings are rendered
Soundproof,
Fireproof
Dampproof,

Architects, Builders, and Contractors

Write for Descriptive Catalogue.

Engineering Department,
24, Lever Street,
MANCHESTER.

Telegrams; "Metallicus, Manchester."

Hollow Wall and Cantilever constructed of 4½-in. brick outer wall and 3-in. (brick-on-edge) inner wall, with 4-in cavity. Distance between Piers, 10 ft. Length of Cantilever, 5 ft. Load on wall, 15,300 lb. Load on Cantilever, 3,360 lb.

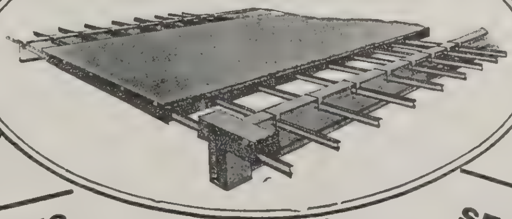
Telephone: 6437 Manchester.

COLUMBIAN FIREPROOFING Co., Ltd.

Reinforced Concrete Floors.

RITZ HOTEL, PICCADILLY.
WARING'S, OXFORD ST., W.
ROYAL INFIRMARY, GLASGOW.
"MORNING POST," STRAND.
LAMBETH DISTILLERY.
50 Repeat Orders for L. C. M. BANKS.

ECONOMICAL CONSTRUCTION.
RIGID AND SOUNDPROOF.
SAVING IN COST.
OWNERS & ARCHITECTS ENTIRELY SATISFIED.
SEND FOR PARTICULARS.



"COLUMBIAN" System.

37, KING WILLIAM STREET, LONDON, E.C.

A.W.E.

TEL. No. 5060 BANK.

(Tenders continued from page vi.)

Longbridge, Warwick.—For the erection and completion of a block of three cottages at Longbridge, near Warwich, for Capt. R. Airth Richardson. Mr. C. M. C. Armstrong, architect, Warwick :—

J. G. Fincher and Co., Stratford-on-Avon	£818	6	6
J. H. Cashmore and Sons, Warwick	678	16	0
P. C. Harris, Warwick	653	0	0
G. F. Smith and Sons, Leamington	647	0	0
J. Bailey and Co., Leamington	618	0	0
J. Commander, Tachbrook	598	17	6
R. Bowen, Leamington	598	0	0
A. E. Sheasby,* Barford	587	10	0

Haslington, near Crewe.—For erection of new chancel, vestry, and heating vault at Haslington church, near Crewe. Mr. R. T. Longden, architect, Market Place, Burslem, and Leek :—

T. Godwin, Hanley	£1,617	0	0
H. Jones, Crewe	1,578	0	0
Williams and Sons, Crewe	1,479	18	0
Colley and Lindop, Hanley	1,400	0	0
W. Cooke, Burslem	1,391	0	0
Micklewright and Sons, Crewe	1,345	10	0
Birchall Bros., Middlewich	1,321	8	6
J. Moirey, Crewe	1,318	3	0
F. Matthews, Nantwich	1,284	0	0
Gresty and Co., Willaston	1,240	0	0
J. Stringer,* Sandbach	1,230	0	0
J. Cooke, Wolstanton	1,200	0	0

*Accepted

London, N.—For erection of a new county school at Wood Green, for the Middlesex County Council. Mr. H. G. Crothall, architect :—

Martin, Wells and Co., Ltd.	£13,470
Holloway Bros.	12,400
E. Lawrance and Son	12,367
F. G. Minter	12,340
F. and H. Higgs	12,080
Rowley Bros.	12,080
Mattock and Parsons	11,735
Ford and Walton, Ltd.	11,698
G. Neal	11,496
Treasure and Son	11,453
W. Lawrence and Son	11,444
F. Gough and Co.	11,430
A. Fairhead and Son	11,243
H. Knight and Son	11,050
Mattock Bros.*	11,037

*Accepted.

Stalybridge.—For the erection of a higher elementary school at Waterloo Road, Stalybridge. Mr. George Rowbottom, architect, Portland Chambers, Stalybridge :—

Wellerman Bros., Hyde	£13,994
John Wilson and Sons, Birmingham	10,377
W. Moss and Sons, Ltd., Loughborough	10,360
James Ridyard, Ashton-under-Lyne	9,960
W. Storrs, Sons and Co., Ltd., Stalybridge	9,929
Shuttleworth Bros., Stalybridge	9,920
J. Gerrard and Sons, Ltd., Swinton, Manchester	9,800
Edwin Marshall and Sons, Ltd., Ashton-under-Lyne	9,469
Saxon Bros. and Co., Ltd.,* Stalybridge	9,452
Clayton Bros., Poynton	9,396

*Accepted.

Plumbing, etc.

H. Braithwaite, Leeds	£1,075	0	0
Frank Marland, Ashton-under-Lyne	1,071	0	0
Clayton Bros., Poynton	1,056	0	0
Exors. of J. Arundel, Bradford	1,052	0	0
W. Moss and Sons, Ltd., Loughborough	1,042	0	0
W. Storrs, Sons, and Co., Ltd., Stalybridge	1,029	0	0
S. Marsden and Son, Stalybridge	999	10	0
F. Bateman, Stalybridge	998	0	0
A. Mee, Stalybridge	985	0	0
T. Ford and Son, Stalybridge	983	10	0
Henry Lees and Sons, Ashton-under-Lyne	965	0	0
H. Rigby, Dukinfield	962	0	0
J. Burgess and Sons,* Stalybridge	930	0	0
A. Higginbottom and Sons, Bradford	900	0	0

*Accepted.

Wrexham.—Accepted for the completion of erection of the Alexandra schools, for the Education Committee. Messrs. Burrell and Willey, architects, Market Place Chambers, Durham :—

W. H. Thomas, Oswestry, £3,700.

*Accepted.

Chipping Norton, Oxon.—For the erection of an Oddfellows' Hall. Messrs. Hopkiss and Stephens, architects, 24a, Martineau Street, Birmingham :—

J. S. Kimberley	£2,355
T. Higgs	2,199
Espley and Co., Ltd.	2,190
A. Groves and Son	2,117
F. J. Booth and Son	2,038
T. Hickman	2,020
H. Sharman	1,945
T. Burden	1,920
S. Lewis	1,898

Amended estimates with reductions.

H. Sharman	1,705
S. Lewis	1,680
T. Burden,* Chipping Norton	1,638

*Accepted.

London.—For erection of first portion of Abbey Wood Car Shed, for the London County Council :—

A. Roberts and Co., Earl's Court Road	£20,560	0	0
Patman and Fotheringham, Ltd., Islington, N.	19,971	0	0
E. Lawrence and Sons, City Road, N.	18,789	0	0
J. McCormick and Sons, Essex Road, N	17,971	0	0
Friday and Ling, Erith, Kent	17,747	15	0
Kerridge and Shaw, Cambridge	17,741	10	0
H. Lovatt, Ltd., Wolverhampton	17,671	0	0
Rowley Bros., Tottenham	17,615	0	0
J. and C. Bowyer, Ltd., Upper Norwood, S.E.	17,591	0	0
H. L. Holloway, Deptford	17,400	0	0
J. Mowlem and Co., Ltd., Westminster, S.W.	17,395	0	0
Holloway Bros., Lambeth, S.E.	17,300	0	0
C. Wall, Ltd., Lloyd's Avenue, E.C.	17,250	0	0
Kirk and Randall,* Woolwich, S.E.	16,995	0	0
F. and G. Foster, Norwood Junction, S.W.	16,982	0	0

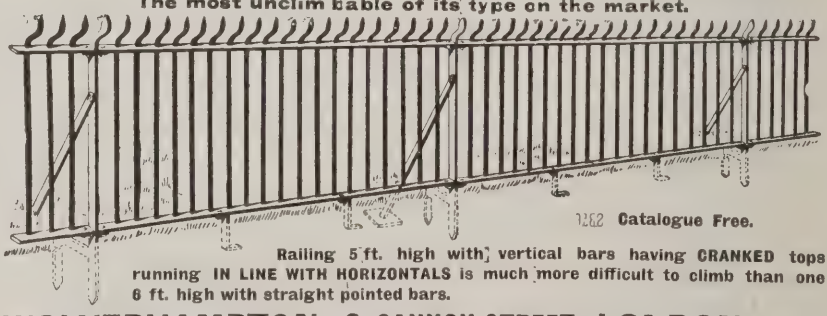
Architect's estimate, £17,200.

*Recommended for acceptance.

Notice to Advertisers

Owing to the Whitsuntide Holidays "The Builders' Journal" for June 2 will close for press on Friday, May 28. Advertisements for this issue and alterations to Serial Advertisements must reach us by first post on that day. Small Advertisements can be received up till 5 o'clock.

BAYLISS, JONES & BAYLISS LTD., THE "CRANKED BAR" RAILING.
The most unclimbable of its type on the market.



1262 Catalogue Free.
Railing 5 ft. high with vertical bars having CRANKED tops running IN LINE WITH HORIZONTALS is much more difficult to climb than one 6 ft. high with straight pointed bars.
WOLVERHAMPTON, & CANNON STREET, LONDON, E.C.

WILLESDEN UNDERLINING PAPER
FOR ALL CLIMATES. WATER-PROOF, ROT-PROOF, INSECT-PROOF.
For Underlining Slates, Tiles, Iron Buildings, with or without Boards. For laying on joists. Placed under Floor Boards excludes damp and deadens sound. Also for damp walls.
WILLESDEN PAPER AND CANVAS WORKS, LTD., WILLESDEN JUNCTION, LONDON, N.W. Established 1870

PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART
TELEPHONE No 8492 Central
MEASURES BROS LTD 53B SOUTHWARK ST LONDON S.E. & PITLAKE, CROYDON.
TELEPHONE No 171 CROYDON.
10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.
SECTION SHEETS, BOOKS & PRICES ON APPLICATION.
CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.
STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about **five days** after the date of this issue.

Unless expressly stated to the contrary, all deposits required for bills of quantities, etc., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

May 28. ROMFORD, ESSEX.—Erection of a new county high school for 250 girls, at Heath Park, Romford, Essex, for the governors. Plans and specification of Hickton and Farmer, FF.R.I.B.A., Bridge Street, Walsall, and Council Chambers "A," Martineau Street, Birmingham, and of D. T. Willan, clerk to the governors, 71, South Street, Romford. Names and addresses, with deposit of £5, to J. Sydney Parmenter, Q.S.A., 73, Duke Street, Chelmsford.

May 28—June 9. CURRAGH CAMP (IRELAND).—Construction of officers' mess and quarters for the Royal Engineers and officers' mess and quarters for the Army Service Corps at Curragh Camp, for the War Department. Plans, etc., of the director of barrack construction, 80, Pall Mall, London, S.W., or at the Barrack Construction Office, at the Curragh Camp, on May 24, 25, and 26. Application, accompanied by deposit of 10s., payable to the assistant financial secretary and crossed "Bank of England for Credit to Army Funds," to the director of barrack construction, by May 28.

May 28—June 12. SITTINGBOURNE (KENT).—Erection of a new council school to accommodate 400 children, at Sittingbourne, Kent. Plans, etc., prepared by the committee's architect, Wilfrid H. Robinson, M.S.A., at the offices of the committee on or after June 1. Name, accompanied by deposit of £1, by noon on May 28, to Fras. W. Crook, secretary, Caxton House, Westminster, S.W. Tenders to the school correspondent, H. Willis, 14, High Street, Sittingbourne, Kent.

May 28—June 12. DUNTON GREEN, NEAR SEVENOAKS, KENT.—Erection of a new council school, to accommodate 250 children, at Dunton Green, near Sevenoaks, Kent, for the education committee. Plans, etc., prepared by the committee's architect, Wilfrid H. Robinson, M.S.A., at the offices of the committee on or after June 1. Name, accompanied by a deposit of £1, by noon on May 28, to Fras. W. Crook, secretary, Caxton House, Westminster, S.W. Tenders to the school correspondent, A. E. Partridge, Longford Brow, Dunton Green, Sevenoaks, Kent.

May 28—June 15. DARTFORD (KENT).—Erection of a new secondary school at Dartford, to accommodate 200 girls, for the education committee. Plans, etc., prepared by the committee's architect, W. H. Robinson, M.S.A., at the offices of the committee on and after June 1. Names, accompanied by deposit of £2, by noon on May 28, to Fras. W. Crook, secretary, Kent, Education Committee, Caxton House, Westminster, to whom tenders are to be sent.

May 29. THORPE-ON-THE-HILL.—Erection of a new Wesleyan Chapel and school. Names of those desirous of tendering should be sent to J. W. Hill, City Chambers, 182, High Street, Lincoln, by above date.

May 31. ADELAIDE and WINDSOR (IRELAND).—Construction and erection of a running shed for engines, with workshops, offices, etc., close to Adelaide and Windsor station, for the Great Northern Railway Company (Ireland). Drawings (eight in number) and specification of W. H. Mills, engineer-in-chief, Amiens Street Terminus, Dublin, or of the district engineer, Belfast, on payment of £2 (not returnable). Tenders to T. Morrison, secretary, secretary's office, Amiens Street Terminus, Dublin.

May 31. BANAGHER.—Alterations to the Presbyterian Manse for the committee. Persons desirous of tendering should apply to the architects, Robinson and Davidson, Richmond Street, Londonderry.

May 31. HENGOED.—Erection of 29 houses at Hengoed, for Levi Davies, Park Road, Hengoed, to whom tenders are to be sent. Plans and specifications with H. Gabe Jones, architect and surveyor, Hengoed.

May 31. CANTERBURY.—Repairs, painting, etc., to 22, Lower Bridge Street, for the corporation. Particulars of Arthur C. Turley, A.M.I.C.E., city surveyor, Guildhall Street, Canterbury. Tenders to the town clerk.

May 31. ABERCARN.—Erection of Sunday school premises in connection with the Garn Congregational Church, Abercarn. Plans, etc., on deposit of £2 2s. with R. L. Roberts, M.S.A., architect, Abercarn, Mon., to whom tenders are to be sent.

May 31. LOWCA (near WHITEHAVEN).—Various works in erection and completion of a mission room at Lowca for the trustees of the Primitive Methodist Church. Plans, etc., of Charles W. Eaglesfield, architect and surveyor, Gordon Street, Workington.

May 31. NEWBRIDGE.—Erection of schools at Newbridge. Plans, etc., at office of Francis Bergin, B.E., 36, Westmorland Street, Dublin. Bills of quantities from James Mackey, 58, Dame Street, Dublin, on payment of £1 1s.

May 31. BRIXHAM, DEVON.—Erection of a residence adjoining the Berry Head Road, at Brixham, Devon, for Charles Hellyer, J.P. Drawings, etc., of Fred. Wm. Vanstone, C.E., architect and surveyor, Palace Chambers, Paignton, on deposit of £3 3s.

May 31. BARGOED.—Erection of forty or more houses at Bargoed, for the "Graig Building Club," Bargoed. Tenders to be sent to Ewart H. Phillips, secretary, Central Chambers, Bargoed. Plans, etc., of H. Gabe Jones, architect and surveyor, Hazeldene, Hengoed.

May 31. CONSETT (DURHAM).—Extensions to the technical institute at Consett, for the C.C. Plans, etc., at the higher education office, Shire Hall, Durham. Bills of quantities of J. A. L. Robson, secretary for higher education, Shire Hall, Durham, to whom tenders should be sent.

May 31. CHESTER-LE-STREET.—Erection of a secondary school for the Durham C.C. Plans, etc., at the education architect's office, Shire Hall, Durham. Bills of quantities of J. A. L. Robson, secretary for higher education, Shire Hall, Durham, where tenders are to be sent.

May 31. EDINBURGH.—Granite drinking fountain in East Princes Street, Edinburgh, for the City Council. Plans, specifications, quantities, and forms of tender from J. A. Williamson, A.R.I.B.A., Public Works Officer, City Chambers. Tenders to the town clerk, City Chambers, Edinburgh.

May 31. BATH.—Execution of (1) repair of sustaining and fence walls on the Bath and Bristol main road, near Saltford Station; (2) repair of walls on the east approach to new bridge over the River Avon, on Bath and Bristol main road; (3) repair of sustaining and fence walls at Oldford two bridge, on the Bath and Frome main road; for the Somerset C.C. Specifications, bills of quantities, and forms of tender, of H. T. Chapman, county surveyor, 1, Chapel Row, Bath, to whom tenders are to be sent.

May 31. BUCKIE.—Execution of mason, carpenter, slater, plaster, plumber, painting, and glazing works in the erection of two houses, one in Cathcart Street for Joseph Garden, and the other in St. Peter's Road, for Wm. Reid. Plans, etc., with Wm. Hendry, architect, to whom tenders are to be sent.

June 1. GRAVESEND.—Repairs at cookery school, for the education committee. Specification of the borough surveyor, town hall. Tenders to be sent to H. H. Brown, town clerk.

June 1. MORPETH.—Extending the pupil teacher centre for the Northumberland education committee. Persons desirous of tendering should apply to the secretary, C. Williams, Moothall, Newcastle-on-Tyne.

June 1. HEMEL HEMPSTEAD.—Repairs and decorations to municipal buildings for the corporation. Specification and form of tender from Walter R. Locke, borough engineer and surveyor, town hall, Hemel Hempstead.

June 1. BARBY, NORTHANTS.—Alterations and additions at the Barby School, for the managers. Drawings and quantities by the architect, J. T. Blackwell, 53, High Street, Kettering, to whom applications for bills of quantities must be made by above date.

June 1. PORTSLADE-BY-SEA (SUSSEX).—Erection and completion of a fire brigade station, for the U.D.C. Plans, etc., of the surveyor, 46, St. Andrew's Road, Portslade-by-Sea. Tenders to be sent to Thomas Austen, clerk, council office, Portslade-by-Sea.

June 1. LOWCA.—Various works in the erection and completion of a mission room at Lowca for the trustees of the Primitive Methodist Church. Plans and sperifications of Charles W. Eaglesfield, architect and surveyor, Gordon Street, Workington, to whom tenders are to be sent.

June 1. MAYHILL, SWANSEA.—Erection of eight cottages (in two blocks of four each) at Hayhill, for the corporation. Plans, etc., of Marcus Hoskins, F.S.I., borough estate agent, Coleridge House, Swansea, upon deposit of £3 3s. Tenders to be sent to John Thomas, town clerk, Guildhall.

June 1. ABBEYLEIX.—Erection of a new banking house and offices at Abbeyleix, Queen's Co., for the Hibernian Banking Company. Plans prepared by J. P. Wrenn, M.R.I.A.I., architect, 16, Nassau Street, Dublin. Quantities of W. Butler, 58, Mountjoy Square, Dublin, on deposit of £2 2s.

June 1. SOUTHEND-ON-SEA.—Alterations and additions to London Road Boys' Council School, for the education committee. Names and addresses to the architects, Cabuche and Hayward, 18, Eldon Street, London, E.C., with deposit of £2 2s. Tenders to be sent to J. W. Barrow, clerk to the committee, education offices, municipal buildings, Southend-on-Sea.

June 1. HAMPTON-ON-THAMES.—Alterations and repairs at the property known as River View, in Thames Street, Hampton-on-Thames. Plans, etc., of Fredk. G.

Hughes, architect, the Estate Office, Hampton, Middlesex. Tenders are to be delivered to Edgar Cozens, solicitor, Hampton, clerk to the trustees of the Hamton, clerk to the trustees of the Mampton Parochial charities.

June 1-14. SOLIHULL.—Alterations and additions to the workhouse, for the guardians. Plans, etc., of the architect, W. H. Ward, Paradise Street, Birmingham, to whom names accompanied by deposit of £3 3s. (cheque) must be sent by June 1. Tenders to be sent to Francis Ladbury Thompson, clerk to the guardians, union offices, Council House, Sparkhill, near Birmingham. Fair wages clause.

June 2. DUBLIN.—Erection and addition to Fairview post office, Dublin. Plans, etc., at the office of public works, Dublin. Tenders to be sent to H. Williams, secretary, office of public works, Dublin.

June 2. CANTON (CARDIFF).—Erection of a church in St. John's Parish, Canton, Cardiff, to seat over 700 persons, for the Rev. H. J. Williams, rector, and committee. Plans, etc., of George E. Halliday, F.R.I.B.A., 19, Castle Street, Cardiff.

June 2. BURY.—Erection of an electricity generating station, at Chamber Hall, Bury, for the corporation. Drawings, etc., of Arthur W. Bradley, Assoc.M.Inst.C.E., borough engineer and surveyor, Bank Street, Bury, on deposit of £2. Tenders to be delivered to the town clerk, Bury.

June 2. LONDON.—Execution of plastering, joinery, glazing, brick and other partitions, steel framing and sashes, sanitary work, etc., for the new G.P.O. (King Edward Building) for the commissioners of H.M. Works and Public Buildings. Drawings, specification, and conditions and form of contract of the principal architect, H.M. Office of Works, Westminster. Bills of quantities and forms of tender on deposit of £1 1s. with the secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W.

June 3. INISHOWEN (SCOTLAND).—Erection of a single labourer's cottage in the townland of Carthage, for the Inishowen R.D.C. Plans, etc., of Robert Moore, clerk, Carndonagh. Tenders to be sent to the clerk.

June 3. DOB'S HILL, NEAR BUCKLEY.—Erection of a new isolation hospital at Dob's Hill, near Buckley, for the Hawarden R.D.C. Drawings, etc., on deposit of £2 2s. with the architects, John H. Davies and Sons, 14, Newgate Street, Chester. Tenders to be sent to Hugh Roberts, clerk of the council, clerk's offices, Broughton, near Chester.

June 3. BETHNAL GREEN, E.—Erection of vagrant wards, at Hollybush Gardens, Bethnal Green Road, E., for the board of guardians. Specification, etc., of the architect, W. A. Finch, 76, Finsbury Pavement, E.C. Written application, accompanied by deposit of £5, before noon, on above date, to D. Thomas, clerk to the guardians, guardians' offices, Bishop's Road, Victoria Park, N.E.

June 3. BARRY (CARDIFF).—Alterations and additions to Cadoxton infants' school, Barry, for the education authority. Plans, etc., of the architect, G. A. Birkenhead, Caledonian Chambers, St. Mary Street, Cardiff, and St. Nicholas Road, Barry, from whom bills of quantities and forms of tender can be obtained on deposit of £2 2s. Tenders to be sent to T. B. Tordoff, clerk, council offices, Barry.

June 4. RUGBY.—Enlargement of Rugby head post office, for the Commissioners of H.M. Works and Public Buildings. Drawings, etc., of the Postmaster of Rugby. Bills of quantities and forms of tender on deposit of £1 1s. with the secretary H.M. Office of Works, etc., Storey's Gate, London, S.W., to whom tenders are to be sent.

June 4. MEOLFRE, ANGLESEY.—Construction of lifeboat-house and slipway, for the committee of management of the Royal National Lifeboat Institution. Plans, etc., of the local hon. secretary, Major Lawrence Williams, Parciau, near Moelfre, Anglesey; or of the engineer and architect, W. T. Douglass, M.Inst.C.E., 15, Victoria Street, Westminster, London, S.W., of whom bills of quantities may be obtained on deposit of £1.

June 4. WAKEFIELD.—Conversion of closets (builder) at the Ferrybridge provided school, Ferry Fryston, also erection of a new cloak-room, etc. (builder, joiner, slater, plaster, plumber and painter), at Queensbury Catherine Slack provided school, for the West Riding education committee. Plans, etc., of the West Riding architect, County Hall, Wakefield, at which address with the Treasurer is to be deposited £1. Tenders to be sent to Francis Alvey Darwin, clerk, County Hall, Wakefield.

June 4. WAKEFIELD.—Execution of builder, joiner, slater, plasterer, plumber, and painter works at Woodlands new school (two blocks) near Doncaster, also builder, joiner, slater, plumber, and asphalte works at Steeton provided school, for the West Riding education committee. Plan, etc., of the West Riding architect, county hall, Wakefield, at which address is to be lodged with the treasurer a deposit of £1. Tenders to be sent to Francis Alvey Darwin, clerk of the C.C., County Hall, Wakefield.

June 5. NELSON (LANCS.).—Construction of a retaining wall near the sewage works, for the sewage and streets committee. Plans, etc., of B. Ball, A.M.I.C.E., borough engineer and surveyor. Tenders to be delivered to the town clerk.

June 5. NELSON (LANCS.).—Erection of three shelters in Victoria and Walverden Parks, for the watch, parks, and cemetery committee. Plans, etc., of B. Ball, A.M.I.C.E., borough engineer and surveyor. Tenders to be delivered to the town clerk.

June 5. STANWELL (MIDDLESEX).—Erection of a chapel for the burials committee, Ashford Parish Council. Drawings, etc., of the architect, W. Ralph Low, 10, Basinghall Street, E.C. Specification and conditions on deposit of £1 1s. with the clerk to the council, E. H. Bennett, Ashford, Middlesex.

June 7. BRIDLINGTON.—Erection of new buildings in extension of the Bridlington high school for girls. Drawings, etc., on deposit of £1 with John Bilson, architect, 23, Parliament Street, Hull. Tenders to be delivered to Geo. G. O. Sutcliffe (clerk to the governors), solicitor, Bridlington.

June 7. AWBRIDGE (SOUTHAMPTON).—Erection of an additional classroom for forty children, and a cloakroom at Awbridge council school, for the C.C. Plans, specification, and conditions (no quantities), of W. J. Taylor, county surveyor, The Castle, Winchester. Tenders to be delivered to H. Barber, clerk of the C.C., The Castle, Winchester.

June 8. CONISBOROUGH.—Alterations to conveniences, erection of playsheds, etc., etc., at Conisborough Morley Place provided school (builder, joiner, slater, plumber, plasterer, painter, asphalter, and heating engineer), for the West Riding C.C. Bills of quantities, whole or separate tenders, of W. R. Hudson, education ouce, Mexborough.

June 8. BIRMINGHAM.—Erection of chimney stack and extensions to engine foundations, etc., at electric generating station, summer lane, Birmingham, for the corporation. Applications before May 22 of the architects, Ewen Harper and Brother, Ruskin Chambers, 191, Corporation Street, Birmingham. Tenders to the chairman of the electric supply committee, Council House, Birmingham. £2 2s. deposit. Fair wages clause.

June 9. MARYTAVY, near TAVISTOCK. —Alterations and additions to North Warne Farmhouse. Plans, etc., at the Farmhouse by appointment, or with Morley B. Collins, architect, Redruth, to whom tenders are to be sent.

June 9. NEW SOUTHGATE, N.—Erection of a new postal sorting office at New Southgate, for the Commissioners of H.M. Works and Public Buildings. Drawings, etc., of J. Wager, A.R.I.B.A., H.M. Office of Works, Westminster, on deposit of £1 1s. Tenders to be sent to the secretary, H.M. Office of Works, etc., Storey's Gate, S.W.

June 10. LONDON.—Execution of masonry, plastering, joinery, glazing, plumbing, etc., at the new Western District post office, Wimpole Street (2nd contract), for the Commissioners of H.M. Works and Public Buildings. Drawings, etc., of J. Wager, A.R.I.B.A., H.M. Office of Works, Westminster, on deposit of £1 1s. Tenders to be sent to the secretary, H.M. Office of Works, etc., Storey's Gate, S.W.

June 10. WHISTON.—Erection and completion of a new block for male mental cases at the workhouse, Whiston, for the Prescot guardians. Quantities of Jas. Gandy, architect, Masonic Buildings, St. Helens, on deposit of £2 2s. Also alterations to cottage at the nurses' home, Whiston. Quantities as above on deposit of 5s. Also cleaning and painting a portion of the hospital buildings. Specification as above on deposit of 5s.

No date. LEEDS.—Alteration and extension to the Leeds trades council offices. Particulars of W. S. Braithwaite, architect, 6, South Parade, Leeds.

No date. TRIMDON GRANGE (DURHAM).—Erection of 6 new houses. Particulars, plans, and specifications from Wandless, Orton, and Wilkinson, Trimdon Grange.

No date. BOWNESS.—Various works in the enlargement and alteration of the Royal Oak Hotel, Bowness, for Alexander and Sons. Plans and bills of quantities on application to John Hutton, M.R.S.I., architect, Kendal.

No date. ABERDARON (CARNARVONSHIRE).—Completion of eight cottages at Aberdaron, Carnarvonshire. Particulars on deposit of 10s. 6d. with H. Clapham Lander, A.R.I.B.A., Effingham House, 1, Arundel Street, Strand, London, W.C.

No date. RHYD, NEAR TNYHWLCH. —Erection of a new school at Rhyd, near Tanyhwlch, for the Merioneth education committee. Plans, specifications, and further particulars of Deakin and Howard Jones, M.S.A., Plas Ynys, Borth, R.S.O.

No date. MARKINGTON.—Alterations and additions to Holly Bank, Hob Green, Markington, for E. and C. Bottomley, Bradford, also for stabling, coachhouse, and outbuildings. Names to Richard Crosland, architect, 67, Station Parade, Harrogate.

No date. PONTYPRIDD.—Pulling down three houses and erecting four shops and dwelling-houses, in High Street, Pontypridd, for Gomer Jenkins. For particulars apply by letter to Frank Roberts, 4, Rickard Street, Pontypridd.

No Date. CROSSGAR, CO. DOWN.—Erection and completion of new school buildings at Crossgar, Co. Down. Plans and specification from Rev. James M'Ardle, P.P., Parochial House, Crossgar, or J. J. M'Donnell, architect, 27, Chichester Street, Belfast.

No Date. EAST KIRBY.—Erection of slaughterhouses, cooling-room, cattle lairs, etc., for the Kirby-in-Ashfield Industrial Cooperative Provident Society, Ltd. Applications accompanied by deposit of £1 1s. should be made to W. H. Woods, M.R.S.I., architect, High Street, Long Eaton.

No date. STRATFORD-ON-AVON.—Erection of a villa residence at Stratford-upon-Avon, for W. S. Brassington, F.S.A. For particulars, apply to E. G. Holton, architect and surveyor, 58, Henley Street, Stratford-on-Avon, from whom copies of quantities may be obtained on deposit of £1 1s.

No date. CROESOR, MERIONETH.—Erection of new offices and boundary walls, also carrying out ventilation, drainage, and sundry other works at Croesor council school, for the Merioneth education committee. Plans, specifications, and further particulars, of Deakin and Howard Jones, M.S.A., Plas Ynys, Borth, R.S.O.

ENGINEERING.

June 1. SOLIHULL.—Heating and hot and cold services for additions to the workhouse for the union. Plans, etc., of the architect, W. H. Ward, Paradise Street, Birmingham. Tenders to be sent to Francis Ladbury Thompson, clerk to the guardians, Union Offices, Council House, Sparkhill, near Birmingham. Fair wages clause.

June 5. NOTTINGHAM.—Construction and erection of a bridge over the canal, Meadow Lane, Nottingham, for the corporation. Drawings, etc., of Arthur Brown, M.Inst.C.E., city engineer, Guildhall, Nottingham, on deposit of £2 2s. Tenders to be sent to J. A. H. Green, town clerk, Guildhall, Nottingham. Fair wages clause.

June 10. DUDLEY.—Supply, delivery, and erection of a motor generator with switchgear, for the corporation. Specification, etc., from the borough electrical engineer, electricity works, Bull Street, Dudley, on deposit of £1 1s. Tenders to be delivered to Hy. C. Brettell, town clerk, town hall, Dudley.

IRON AND STEEL.

June 1. LONDON (for Queensland).—Supplying 9,823 tons of steel rails and fishplates, to be delivered at Brisbane, Townsville, and Cairns, for the agent-general for Queensland. Drawings and specifications, accompanied by a preliminary deposit of one per cent. on the amount of the tender, with the agent-general for Queensland, 409, Strand, London, W.C.

June 2. EALING.—Supplying steel and iron work, including new corrugated iron roof, in connection with the extension of the tipping platform of the destructors at the sewage works, South Ealing. Drawings, etc., from Charles Jones, M.Inst.C.E., borough engineer, town hall, Ealing, W., upon deposit of £2 2s. Tenders to be sent to Geo. E. Brydges, town clerk, town hall, Ealing, W.

PAINTING.

May 31. GOOLE.—Painting the exterior wood and iron work of the cemetery buildings and premises for the Burial Acts committee. Specifications and forms of tender of J. Burniston, clerk to the committee, 23, Boothferry Road, Goole.

May 31. WIGAN.—Painting, colouring, limewashing, etc., required at the following schools, for the corporation:—Wesleyan; St. Catherine's; St. Patrick's; National and Blue Coat; Poolstock; Pemberton Colliery; St. John's, Pemberton; Marsh Green; St. Joseph's; St. Michael's; St. Thomas's, Caroline Street; St. Thomas's, Clayton Street; also for limewashing, etc., at other schools. General specification and particulars of Geo. H. Mockler, director of education, education offices, Wigan.

June 1. CAMBRIDGE.—Painting the outside of certain houses, for the corporation. Specification, etc., of the borough surveyor, Guildhall, Cambridge. Tenders to be delivered to J. E. L. Whitehead, town clerk, Guildhall, Cambridge.

June 1. NELSON (LANCS.).—Painters' and decorators' work at Whitefield council schools, for the education committee. Particulars of B. Ball, A.M.I.C.E., borough engineer and surveyor. Tenders to be delivered at the town clerk's office.

June 1. WALSALL.—Painting the outside of the council-house and town hall, for the corporation. Specification of the borough surveyor, Council House, Walsall. Tenders to be sent to John R. Cooper, town clerk, Walsall.

June 2—14. WEST HAM.—Cleansing, repairs, and painting of schools during the summer vacation, for the corporation. Written application to William Jacques, A.R.I.B.A., architect to the education committee, 2, Fen Court, Fenchurch Street, E.C., for specification and form of tender, by June 2, accompanied by a deposit of £1 (cheques not accepted). Tenders must be delivered by registered post at the Educational Department, 25, The Grove, Stratford. Fair wages clause.

June 9. SUTTON, SURREY.—Cleaning and painting works and repairs at the Downs School, Sutton, Surrey, for the Metropolitan Asylums Board. Conditions of contract, etc., at the office of the Board, Embankment, E.C., on deposit of £1.

June 11. WARRINGTON. — Painting various schools, for the cities and buildings committee. Specifications, etc., of the borough surveyor, town hall, where tenders must be delivered. 10s. 6d. deposit.

June 12. RAMSBOTTOM.—Beautifying St. Paul's Church, Ramsbottom. Specifications on personal application to the Vicar.

June 19. MACCLESFIELD.—Outside painting of the infirmary annexe and nurses' home at the Parkside Asylum, for the C.C., of Chester. Specification, etc., of H. Beswick, county architect, Chester. Tenders to be sent to A. C. Procter, clerk to the committee of visitors, 23, King Edward Street, Macclesfield.

PLUMBING & SANITARY

June 7. HASTINGS.—Erection of a public convenience in Fairlight Road, St. Helen's, Hastings, for the corporation. Drawings, etc., of the borough engineer, P. H. Palmer, M.I.C.E., town hall, Hastings. Tenders to be sent to Ben. F. Meadows, town clerk, town hall, Hastings.

June 7. HEXHAM.—Construction of about 6,000 yards of 15-in., 10-in., 9-in., and 6-in glazed earthenware pipe sewers, with manholes, lampholes, etc., for the R.D.C. Plans, etc., of the engineer, J. E. Parker, A.M.I.C.E., Post Office Chambers, St. Nicholas' Square, Newcastle-on-Tyne, on deposit of £1 1s. (cheque). Tenders to be sent to H. Nicholson, clerk to the council, Hexham.

June 8. SEACROFT.—Drainage work on the Killingbeck Hospital Estate, Seacroft, for the corporation of Leeds. Plans, etc., of the steward, Seacroft Hospital. Tenders to be sent to Robert E. Fox, town clerk.

ROADS AND CARTAGE.

May 31. TUNSTALL.—Tar macadamising portions of walks in additions to the cemetery, for the Burial Board of District Parish of Christ Church. Specifications of W. Capey, clerk to the Burial Board, town hall, Tunstall, up to and including date named.

June 1. HORBURY.—Making up Manor Road, for the U.D.C. Drawings, etc., on deposit of £1 1s. with J. H. Drew, engineer and surveyor, town hall, Horbury. Tenders to T. Barker, clerk to the council, town hall, Horbury.

June 1. HERNE BAY.—Paving with tar macadam portion of the promenade for the U.D.C. Specifications, etc., of F. W. J. Palmer, C.E., surveyor to the council, town hall, Herne Bay. Tenders to be sent to Joseph Jubb, clerk to the council, town hall, Herne Bay.

June 5. CRAMLINGTON.—Supplying (1) 1560 tons of broken whinstone; (2) hire of steam roller and watercart; (3) carting whinstone, all for the U.D.C. Specifications, etc., of W. J. Coulson, Council office, Cramlington. Tenders to R. Nicholson, clerk, solicitor and notary public, Morpeth.

June 7. WANDSWORTH.—Making-up and paving Rectory Lane, Tooting, for the corporation. Specification and drawings, and forms of tender, at the borough engineer's office, new streets department, 56, East Hill, Wandsworth, S.W. Tenders to be delivered at the Council House, East Hill, Wandsworth, S.W. Fair wages clause.

June 7. BALHAM.—Making-up and paving Eatonville Road, Balham, for the corporation of Wandsworth. Specification, etc., of the borough engineer, streets department, 56, East Hill, Wandsworth, S.W. Tenders must be delivered at the Council House, East Hill, Wandsworth, S.W. Fair wages clause.

June 9. SUTTON, SURREY.—Road repairing and granolithic paving at the Belmont Stables, Sutton, for the Metropolitan Asylums Board. Drawing, conditions of contract, specification, and form of tender, at the office of the Board, Embankment, E.C., on deposit of £1.

MISCELLANEOUS.

June 3. CASTLEFORD.—Erection of public baths, for the U.D.C. Names and addresses to H. H. Broadbent, clerk to the council, council offices, Castleford.

June 3. SKIPTON.—Mason's, Joiner's, plumber's and slater's work, and also steelwork, in connection with the extension of the retort house at the gasworks, Skipton, for the U.D.C. Plans, etc., of James Hartley, architect, Swadford Chambers, Skipton. Tenders to be sent to J. H. Woodward, gasworks, Skipton.

June 8. MANCHESTER.—Laying and jointing the northern section of the third line of pipes from Thirlmere to Manchester, for the Corporation. Plans and drawings and printed specification, schedule of quantities, and form of tender (except during Whit week) at the offices of G. H. Hill and Sons, civil engineers, Albert Chambers, Albert Square, Manchester, and 3, Victoria Street, Westminster, on deposit of £5 5s. Tenders, endorsed "Thirlmere Aqueduct: Contract A: Tender for Laying, etc., Cast-iron Pipes," and addressed to the chairman of the waterworks Committee, must be forwarded to the secretary, waterworks offices, town hall, Manchester, by June 8.

No Date. SHEEPSCAR (LEEDS).—Erection and completion of Congregational Mission Chapel, Sheepscar, Leeds. Names to G. F. Danby, architect, 73, Albion Street, Leeds.

THE
Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.
Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE Junior Assistant desires post in small office south of Midlands; working drawings, details, help quantities; good draughtsman and tracer; excellent references; salary 22s. per week.—Architect, 36, Devonshire Road, Cambridge.

ACADEMY (Royal) exhibitor prepares perspectives on moderate terms; specimens sent; also designs, plans from rough sketches, drawings, tracings, competition work, etc.—Box 4983, Builders' Journal Office.

ADVERTISER, with six years' practical experience and a knowledge of bookkeeping and office routine, desires situation in builder's or estate agent's office.—C. J. Mounter, 24, Hillfield Road, West Hampstead, N.W. 5028

A "B.B.B."—The British Business Bureau (Architects) 140, Fleet Street, E.C., can recommend several first class assistants. Particulars free on application. No fees. 5066

ADVERTISER, (30), seeks situation in Drawing Office rapid tracer, colourist, good printer; used to making tracings for reproduction. Experience gained in architects' offices.—Box 5057, Builders' Journal Office.

ARCHITECT. Surveyor and Constructional Engineer fully qualified, seeks engagement, 15 years' experience, moderate salary; would represent good constructional firm.—Box 5063, Office of the Builders' Journal.

ADVERTISER seeks position as junior assistant, 3½ years' experience; excellent draughtsman, surveying, levelling, book-keeping, general office routine; highest testimonials; low salary.—Box 5045, Builders' Journal Office.

AN experienced young architect, with small connection, desires position or work at own office; prolific designer and rapid draughtsman; specifications, etc.—"C.," 24, Hainthorpe Road, West Norwood, S.E. 5026

AN Architect's Assistant desires re-engagement; town or country; neat and quick draughtsman; thoroughly capable; moderate salary.—M. P., 358, New Cross Road, S.E.

APPOINTMENT as Improver (19), just completed three years' articles with architect; good draughtsman, tracer, etc.; excellent testimonials; moderate salary.—J.S.C., 10, Almeric Road, Clapham Common. 4993

ARCHITECT'S Assistant desires re-engagement in a good London office; eight years' experience; good references; experience in competition work.—B. E. Atkinson, jun., 14, Rosslyn Hill, Hampstead, N.W. 5018

ARCHITECT'S Assistant (27), good draughtsman and colourist; contract drawings, designs, details, perspectives, surveys; travelling studentship winner; specimens.—H. C. S., 65, Grove Road, Norwich. 5025

ARCHITECT'S Assistant (24), disengaged; Inter. R.I.B.A., 6½ years' varied experience, town and country; working drawings, details, and perspectives; levelling, reinforced concrete details; assist with quantities.—Riches, 35, Culverden Road, Balham, S.W. 5013

ARCHITECT'S Assistant (23), 6½ years' experience; excellent draughtsman, working drawings, details, specifications, surveying; assist with quantities; first-class references.—H.B., 23, Springfield Road, Bury St. Edmunds. 5001

ARCHITECT'S and Surveyor's Assistant (25), 9 years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill, S.W. 4992

ARCHITECT'S Assistant (23), excellent draughtsman, desires re-engagement; six years' first-class experience; contract, detail and competition drawings, specifications, perspectives (exhibitor at Royal Academy); prizeman for architectural design; highest references; moderate terms.—F.E.T., 10, Cobham Road, Kingston-on-Thames. 5015

ARCHITECT, 32, qualified, seeks any position where his services would be available; energetic; disengaged; mod. salary.—Box 5006, Builders' Journal Office.

ARCHITECT'S Assistant, nine years' experience; bronze and silver medallist; acted clerk of works; perspective, details, etc.; assist on quantities.—French, 23, Port Street, S.W.

ARCHITECT'S Assistant seeks engagement; 14 years' experience; plans, details, specifications, quantities, surveying, dilapidations, and levelling; excellent references.—C. G., "Brooklyn," Leas Road, Guildford.

ARCHITECT'S Assistant disengaged, good all-round; design, construction, specification, supervision, dilapidations, surveying, etc.; excellent testimonials.—H., "Bowood," Heronsgate, Ricksmansworth, Herts.

ARCHITECT'S Assistant (24), eight years' experience; chiefly schools; intermediate R.I.B.A., first-class design, construction, architecture, ornament; folio of drawings sent for approval.—Vivian S. Whitaker, Barcroft, Bromsgrove, Worcester. Salary 49s.

ARCHITECT'S Assistant (23), capable draughtsman; good constructionalist; would go on trial for permanency; town or country; temporary work 35s.—H. J. W. E., 1, St. Dunstan's Road, Hanwell, W.

ARCHITECT'S Assistant seeks engagement; good draughtsman; working drawings, details, surveying, levelling, and quantities; eight years' experience.—Owen, "Meadowside," New Queen Street, Chesterfield.

ARCHITECT'S Competent Assistant desires engagement; many years' practical experience; designs, details, specifications, superintendence, surveying; two guineas.—Arch, 23, Lavenham Road, Wandsworth, S.W.

ARCHITECT and Surveyor's junior assistant (22), 4½ years' experience, desires re-engagement; neat and expeditious draughtsman; working drawings, surveying and levelling.—Williams, "Brynderwen," Pontyclun, Glam.

A.R.I.B.A., disengaged shortly, London training; chief and senior assistant in leading provincial offices; expert designer, and experienced in all branches.—A. G., "Beverley," Yardley Wood Road, Moseley, Birmingham.

ARCHITECT'S Assistant (22), desires re-engagement in London office; contract drawings, details, surveys, double scholarship holder; Stage III. Building Construction.—Smeed, 24, West Ham Lane, Stratford, E. 5050

ARCHITECT, prepares designs, working drawings, specifications, on moderate terms; assistance rendered, town or country.—Box 5,036, Builders' Journal Office.

ARCHITECT'S Junior Assistant (20), 4½ years' experience, West End and country offices; working drawings, details, perspectives, competitions, general office routine; excellent draughtsman and tracer. Highest references; salary 25s.—G. W. S., 26, Cowley Road, Ilford, Essex. 5056

AS traveller, constructional steel, or founders; good connection architects, builders; good estimating and draughtsmanship; over 22 years' experience.—W. 61, Royal Hill, Greenwich. 5077

BUILDER'S Clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N. 5037

BUILDER'S Book-keeper, 9 years' excellent reference from present employer. All books, double entry, prime costs, accounts, trading and profit and loss accounts, etc.—Box 5049, Builders' Journal Office.

BUILDER'S Assistant (30), wants position with large provincial builder, accurate surveyor and estimator; extensive experience with architects' settlement and accounts; has revised present temporary employers' routine, and obtains accurate and immediate information on all matters; gives entire satisfaction.—Malpas, Much Hadham, Herts. 5071

BUILDER'S and Contractor's Assistant (29), thirteen year's experience, all branches, including roads and sewers, asphalting, etc.; plans, specifications, quantities and accounts, shorthand, and typewriting.—Box 5069, Builders' Journal Office.

CLERK (24), requires situation in building trade; 7 years' commercial experience; 4 years' in building trade; bookkeeping, correspondence, and general routine; excellent references; moderate salary for prospects.—Box 5068, Builders' Journal Office.

CARPENTER, and French polisher wants situation, young, capable workman, good refs.; moderate wage.—C.P., 21, Redstone Road, Redhill, Surrey. 4989

CLERK of Works, shortly disengaged, well up in all trades; levelling and surveying; best references; abstainer.—R. E., 3, Oakfield Road, Stroud Green, London, N. 5052

CONTRACTOR'S or surveyor's assistant desires situation; experienced in measuring, leveling, setting out, accounts, supervision; good references, moderate salary for permanency. Could invest small sum.—Box 5074, Builders' Journal Office.

DRAUGHTSMAN (26), home or abroad, neat, quick tracer and colourist, working drawings from rough sketches, bookkeeping and general office routine; foreign experience.—H.W., 64, Crofton Road, Camberwell, S.E. 500

ENGINEER, mechanic, desiring change, requires permanent situation on staff, official or private; thorough all-round general experience; married.—J.G., 86, Bathurst Gardens, Willesden, N.W. 501

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfiel Road, Willesden, N.W. 495

GENTLEMAN, with good connection amongst architects and builders with offices in Westminster is open to undertake agency for London and district for good provincial firm.—Box 5072, Builders Journal Office.

JUNIOR (20), 4 years' experience, good draughtsman, quick and accurate leveller and surveyor building, sewerage, water supply, abstracting, billing quantities, typewriting, shorthand; salary no object.—S.F.H., 16, Dodington, Whitchurch, Salop. 503

JUNIOR Assistant, disengaged; good knowledge of domestic architecture.—Reply, J. R. F., 248 Sandycombe Road, Kew Gardens, S.W. 503

MASONRY, manager or foreman, machinery and all details, all classes of masonry work; London and country experience; terms moderate.—G.B., 38 Napier Road, Tottenham, London. 497

FRENCHMAN, Architectural Draughtsman, having an office at Rouen (France) is willing to accept representation of English articles used in building.—Write Ledicn, 39, Petherton Road, Highbury, London, N.

SHOP-FITTING, or high-class joinery, advertiser (38), seeks situation as foreman in shop-fitting or high-class joinery works; can take full control; years' references; abstainer.—Box No. 5007 Builders' Journal Office.

SIGNWRITER, Grainer and Decorator, good; fill up time, Paint, Paper; 10 years' reference; permanency or estate; can take charge.—B.B., 58, Moffatt Road Thornton Heath. 507

TYPEWRITING, tracing, shorthand, good class work, requiring intelligence and accuracy, can be undertaken in spare time by architect's clerk.—Address, "Typist," 2, Marsham Street, Westminster. 504

YOUTH wants situation, surveyor's or builder's office; four years' experience; working up quantities, measuring up, good draughtsman; scholarship holder; excellent testimonial.—J. R. O., 233 Essex Road, N. 501

Appointments Vacant.

CLERK wanted (junior), knowledge of building trade; quick, and good education; salary 10s.—Apply, Architects' Technical Bureau, 24, Har Street, Bloomsbury. 507

WANTED.—Two smart young men for traveling Lancashire and Yorkshire, to sell high-class, widely advertised specialities used in the building trade. Knowledge of and connection in, the Varnish and Enamel trade desideratum, but not absolutely necessary. Good opening for really live travellers.—Apply Box 5058, Builders Journal Office.

Businesses for Sale.

BUSINESS for sale, North London builder and decorator, large jobbing trade, turnover averages £3,000 per annum; price £400, including large plant, horse and van, trucks, compact premises large yard, workshops, stabling; illness cause of selling. — Write, Frank Edwards, 43, Moorgate Street, City. 505

PICTURE Framing, artists' colourman, decorating, jobbing, and undertaking business for sale, in important Surrey town. Only £180 is asked for an old-established business which, under energetic management, would provide a good income. Fir connection. Spacious premises with excellent double-fronted shop; splendid position; low rent.—Agent, Reginald C. S. Evennett, F.A.I., Farnham Surrey, and at Haslemere and Hindhead. 507

Competitions Open.

TO ARCHITECTS PREPARING COMPETITIVE DESIGNS.

SCHEMES FOR ENGINEERING WORK, with approximate Estimates, furnished free of charge by Strode and Co., Lighting, Heating, and Ventilating Engineers, 48, Osnaburgh Street, London.

June 2, 1909. Volume 29. No. 747.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

This issue contains the Official Reports of the National Building Trades Federation, and articles of special interest to Builders and Contractors.

Caxton House, Westminster.

CONTENTS.

Leaders: Reinforcement of the R.I.B.A.; The Trade Boards Bill; the Victoria Monument and Some Others; Labour Exchanges, 513; Dinners and Diners; the National Pantheon 514
The R.I.B.A. Dinner - - - - - - - - 514
The Queen Victoria Memorial - - - - - 516
Legislation and the Building Trade - - 516
Notes on Competitions - - - - - - 517
Correspondence - - - - - - - - 517
The Penalty Clause. By A Barrister -- - 518
The British Fire Prevention Committee Dinner 518
St. Luke's Vicarage, Hornsey - - - - - 519
Notes on Painting and Decoration - - - 520
Our Plate - - - - - - - - - - 520
Builders' Notes - - - - - - - - 521
Buildings in Progress and Completed - - 522
Proposed New Buildings - - - - - 522
Enquiries Answered - - - - - - - 523
Responsibility for Drainage Repairs - - 523
Are Damp Walls Caused by Bad Clay? By A. B. Searle - - - - - - - - - 524
Scaffolding in Brussels. By A. G. H. Thatcher 525
A New Sub-contract Form - - - - - 525
The Testing of Paint. By Gaston Depierres 526
A New Mortice Lock - - - - - - - 528
A New Woodworking Bench - - - - - 528
National Federation Reports - - - 529, 534
A Point in Town Planning. By G. Cadogan Rothery - - - - - - - - - - 534
Coming Events - - - - - - - - - 534
Tenders - - - - - - - - - vi., viii.
Complete List of Contracts Open - - xxi., xxiii.

ILLUSTRATIONS.

"White Horses": Sculptured Relief Panel. F. W. Doyle Jones, Sculptor - - - - 515
The Queen Victoria Memorial. Thomas Brock, R.A., Sculptor - - - - - - 516, 517
St. Luke's Vicarage, Hornsey. Jerdan and Emery, Architects - - - - 518, 520
Houses at Hampstead. Geoffry Lucas, A.R.I.B.A., Architect (see also Centre Plate) - - - - - - - - - - 521
Roof Truss - - - - - - - - -- 523
House at Crossens, Southport. Reginald Tinkler, Architect - - - - - - - 524
Scaffolding in Brussels - - - - - - 525
The Stevens Patent Mortice Lock - - - 528
The Hollyman Patent Work-bench - - - 528

Reinforcement of the R.I.B.A. The special general meeting of the R.I.B.A. held on Monday, May 24th, "to consider the proposals of the Council for the revision of the by-laws under the new Supplemental Charter," was one of the liveliest on record. Most of the Council's proposals were carried either without alteration or with only slight verbal amendment; but in one instance an important modification was carried. By-law 27, relating to the composition of the Council, provided that it should consist of forty members, including only four Associates. It was, however, proposed, seconded, and carried, that the Council should be increased by the addition of two more Associates. And so the Council can no longer be called "the Immortal Forty." Nevertheless, it will not lose by augmentation. That the former representation of Associates on the Council was disproportionately small was thus practically conceded, it must be remembered, by the Fellows who alone have the power of voting on questions relating to the by-laws. It is therefore the more valuable as a slight but very welcome indication that, after all, the R.I.B.A. is not a hopelessly unprogressive body. The reactionaries, however, fought hard; and the debate on this and on other matters of moment was conducted with rare animation and with considerable dialectic skill. Its brightest moments, however, will probably suffer mere eclipse at the resumption on June 7th, when such explosive materials as the ethics of electioneering, and a question of "privilege" are to be handled.

The Trade Boards Bill. In the National Federation reports appearing in the present issue, it is noted that, as a result of an interview with Mr. Winston Churchill, to whom a deputation of the Employers' Parliamentary Council represented the facilities contained in the Trade Boards Bill for injuriously extending its operation to other trades than those scheduled, a promise was given that properly organised trades having machinery for settling such matters should be adequately safeguarded by modifications in Committee. This specific instance, however, does not quite fully meet the general objection by the Yorkshire Federation to the mischievous and growing practice of extending the scope of such Bills by the insertion of a clause giving this arbitrary power to a Secretary of State. In the case of the Trade Boards Bill, the first clause, as it originally stood, gave power to the Board of Trade to apply the Act to unscheduled trades as to which the Board was satisfied that the rate of wages was exceptionally low. Mr. Churchill, in promptly acceding to the reasonable request of the employers' deputation, by securing that extensions to unscheduled trades may not take place except by means of a Provisional Order and Act of Parliament, has demonstrated yet again the immense value of influential organisations in protecting the interests they represent.

The Victoria Monument and Some Others. The uncovering to the public gaze of the lower portion of the national memorial to Queen Victoria in the Mall should not give rise to the impression that the monument is nearing completion. It is not likely to be ready before the summer of 1911, even supposing that no unforeseen delay occurs. It is a stupendous undertaking; and all the monuments in this country, or elsewhere, that are at all comparable to it, have, as Mr. M. H. Spielmann has pointed out as a palliative to impatience, afforded so many concrete illustrations of the adage that art is long. The Petersburg monument to Peter the Great was twelve years in the making, the Vienna memorial to the Empress Maria Theresa twelve years, the Albert Memorial twelve years. The memorial to King Victor Emmanuel, in Rome, is not nearly finished after twenty-five years' continuous work. It is estimated that the cost of this monument, upon which already more than a million sterling has been spent, will ultimately exceed two millions. It is well that the cost is being distributed over so long a period of years. Mr. Spielmann admires Zumbusch's Maria Theresa monument in Vienna, but holds that the great variety of sizes in the different figures is a rather serious drawback. The more modern monument to Gambetta, in Paris, by M. Aule, he regards as a capital example of the excellent silhouette type beloved of French sculptors; the Spanish sculptor Querol's monument to Alfonso XII. is, he thinks, too much of a *tour de force*; and the monument he likes best of all is that in Berlin to Frederick the Great, by Rauch, "a work fine in character, excellent in effect and in light and shade, and admirable in technical details of texture and finish." Concerning the monument to Queen Victoria, the exposed portion has evoked a chorus of praise. One admirer finds that "the rhythm of the superbly modelled figures has the swing and swish associated with the seas that carry Britain's authority over the world." This dithyramb was apparently penned on Empire Day. Mr. Thomas Brock, R.A., has finished the colossal marble statue of the Queen (it is 17ft. high), as well as the group representing "Justice" and "Motherhood;" while the statue of "Victory" is in the hands of the founders. This figure will crown the monument, and will be higher than Buckingham Palace. If the combined efforts of Sir Aston Webb and Mr. Thomas Brock yield the magnificent consummation that this partial unveiling has rendered more than ever probable, Buckingham Palace will hardly survive the comparison. It will have to give place to a more worthy building. But what a pity that the new Palace and the new monument could not be simultaneously designed in a complete scheme. But in this country everything relating to art is cruelly cramped for want of a mere modicum of the courage and enterprise that, exhibited abundantly in other directions, are the national boast.

Labour Exchanges. The Labour Exchanges Bill, of which the text has just been issued, is probably of more importance to builders than to any other class of the community, not even excepting agriculturists, whose industry keeps them away from the towns, where the exchanges will necessarily be situated. Ever since the days of Sir Thomas Gresham, the exchange has been indispensable to commerce; and now it would seem as if the tremendous pressure of the unemployment problem had forced the Government to attempt a really serious application of the principle to the conditions peculiar to the hiring of labour. The text of Mr. Churchill's Bill is vague and indeterminate. It simply seeks to assume for the Board of Trade power to establish and maintain labour exchanges, and to assist labour exchanges maintained by other authorities and persons. Apparently the Board is to have *carte blanche* to exercise this power as it thinks fit. It may appoint officers and servants for the purposes of the Act, make general regulations as to the management of the exchanges, authorise advances to be made by way of loan towards meeting the expenses of workpeople travelling to places where employment has been found for them through a labour exchange, and prosecute any person making false representations for the purpose either of obtaining employment or procuring workpeople. Reticence as to the details of working this machinery is perhaps wise. It may be inferred that the chief object is to co-ordinate scattered forces, and to bring order out of chaos by rendering more uniform, more systematic, and altogether more effectual the means of bringing together the work and the workpeople — to galvanise into vital activity and to link up into helpful co-operation the various agencies already existing, and, above all, to supply the necessary funds. Such exchanges can do little in the way of making work (although they can occasionally set a man on to a job that goes undone for want of a suitable man to do it), but they can do much in distributing it—or, rather, in distributing the men who require it, and thus relieving congestion of work and congestion of workers. The exchanges would be freely used by employers when it was found that genuine and competent workers made free use of such agencies; and self-respecting craftsmen or labourers would freely apply to the exchanges as soon as it was found that no "relief-works" taint was implied in the application. The convenience to employers is sufficiently manifest; so, alas! is the fact that upon them will largely fall the burden of paying the inevitable bill.

Dinners and Diners. The dinner of the Royal Institute last Wednesday evening brought together an assembly of people distinguished in many different walks of life. It suffered somewhat from the size of the gathering and from the consequent fact that at a distance some of the speakers were almost inaudible. Mr. Blomfield's speech was marred by this difficulty, and from our end of the hall it was only possible to catch a word now and then. Sir Charles McLaren, M.P., made due apologies for the parsimony of Parliament in the encouragement of architecture, but claimed for the members of the House of Commons an open-handed generosity in devoting sums for the benefit of architectural schemes which architects will hardly, we think, endorse. The difficulty, according to Sir Charles, lies with the Treasury, but he still expects to see Hyde Park Corner taken in hand and made something of. A fine opera house was his own suggestion; and he has hopes for a new front to Buckingham Palace. Mr. Henry Morris, the well-known surgeon, responding for Science, was able to claim a number of past practitioners in medicine among the poets, authors, and artists, and even the redoubtable Wren was a distinguished anatomist. One's general impression of the assembly was that of a restlessness, and with the very fateful Council election upon them it was not perhaps to be wondered at that the members should discuss the probable constitution and policy of the new Council. It is rumoured that the poll for the new Council is a heavy one, and in ordinary circumstances this would point to the success of the forward movement. We do not doubt that most of the members will be eager to learn the results of the poll, to be announced on June 7th.—The British Fire Preventers, to the number of about 80, celebrated the tenth anniversary of their incorporation on the 25th ult., and, as in the case of the R.I.B.A. dinner, the proceedings verged on the early hours. It occurs to us that the toast lists of most of these dinners are rather formidable, and that it might be preferable, where the speeches are to be made the vehicle of some important discussion or statement of policy, that they should be printed beforehand and circulated with the table plan. The presenters and seconders might then rise and formally draw attention to the speeches printed in the list. This would be more valuable, as in many cases distinguished men, down for speeches, are prevented from being present, and the gatherings are thus deprived of their valuable ideas and opinions. It would also obviate the difficulty already indicated of speakers being inaudible.

The National Pantheon. In the House of Commons last Wednesday, the subject of burial in Westminster Abbey and the Dean's right of veto was raised by Mr. Godfrey Baring, who questioned whether legislation could not be introduced which would place the control of sepulture in other hands than those of the Dean. We presume that the enquiry resulted from a certain disappointment that the Dean could not see his way to permit the burial of the late Mr. George Meredith within the Abbey precincts. As to the ethics of burial in the Abbey, we, of course, offer no opinion; but from the structural point of view we would like to point out that the Abbey was not originally designed as a burying place, and that frequent excavations within its walls may naturally be expected to weaken the superstructure. In the case of St. Paul's it has been many times pointed out how seriously the stability of the fabric is injured by cutting through the concrete foundation. Apart, however, from the question of endangering the edifice, the Abbey is at present so full of the bones of the illustrious dead that the time has come to consider seriously what policy should be pursued with regard to burials in the future. Designs have been prepared in past years for an addition constructed for the purposes of an English Pantheon, and we think the Government and the Abbey authorities would be well advised to consider the idea seriously.

THE R.I.B.A. DINNER.

The annual dinner of the Royal Institute of British Architects was held in the Whitehall Rooms, Hotel Metropole, on Wednesday evening last, the President, Mr. Ernest George, being in the chair. Amongst the guests present were Sir Charles McLaren, M.P., Sir Melvill Beachcroft (chairman of London County Council), Sir Ernest Waterlow, R.A., Sir L. Alma-Tadema, R.A., Sir James Linton, R.I., Sir Henry Howorth, K.C.I.E., Sir T. Vansittart Bowater, Mr. W. H. Lever, M.P., the Ven. Archdeacon Sinclair, Mr. J. S. Sargent, R.A., Mr. Thomas Brock, R.A., Mr. Frank Dicksee, R.A., Mr. Henry Morris (president Royal College of Surgeons), Mr. Philip Norman, F.S.A., Mr. W. J. Locke, Mr. A. R. Stenning (president Surveyors' Institution), Professor Gerald Moira, Mr. Bertram MacKennal, A.R.A., Mr. P. Ogden Lawrence, K.C., Mr. F. G. Rice (president London Master Builders' Association), Mr. W. F. Wallis (president Institute of Builders), and Mr. G. L. Gomme, F.S.A. (clerk to L.C.C.). Among the architects present were Mr. Fredk. Batchelor, Professor Reginald Blomfield, A.R.A., Messrs. Detmar Blow, Geo. T. Brown, G. E. Bond, John J. Burnet, A.R.S.A., James T. Cackett, T. E. Collcutt, A. W. S. Cross, E. Guy Dawber, Sir William Emerson, Messrs. J. S. Gibson, Alex. Graham, Edwin T. Hall, Henry T. Hare, E. L. Lutyens, Mervyn Macartney, W. H. May, Paul Ogden, Professor C. H. Reilly, Messrs. Percy Robinson, W. H. Seth-Smith, John W. Simpson, John Slater, Sir Henry Tanner, Sir John Taylor, Sir Brumwell Thomas, Sir Aston Webb, R.A., and Mr. Percy S. Worthington.

Mr. John W. Simpson, vice-president, proposing the toast of "The Houses of Parliament," observed that their art was dependent on good order and good government, and that architects were outside the strife of legislative effort. Politically, the architect was a curious study. The American definition "mugwump" was not inappropriate, for the architect was a conscientious opportunist. In regard to schemes for improvements, new streets and developments, he was recklessly radical, but in the preservation of ancient buildings he was intensely conservative.

Sir Charles McLaren, M.P., in reply, said he thought politics and art had not been very good friends since the days of the Florentines. At the beginning of the 19th century, when oratory was at its greatest height, art was at its lowest. Now that oratory was said to have disappeared from Parliament, he hoped art would show a compensating rise. Speaking for the House of Commons, they were always ready to vote money for fine buildings, but the Treasury was the difficulty. Sir Charles concluded with a tribute to Mr. Brock's fine memorial in the Mall.

Professor Reginald Blomfield proposed the toast of "Art, Science, and Literature." He said all architects worthy of the name were artists by intention if not by achievement. Their art exercised a fascination denied by a more prosaic calling. One should not perhaps blow one's own trumpet, but if no one else would do so he thought he might give a humble tootle himself. He instanced a letter in "The Times" recently, which stated that the standard of architecture in this country was higher than at any time since the 18th century, and he thought that statement extremely well founded; but architecture did not meet in this country with the recognition it deserved, and he thought that was not so much the fault of the public as the fault of those gentlemen through whose eyes the public sees all works of art. There were writers who used architecture to belabour societies and people with whom they disagreed, and others—and this was the unkindest cut of all—who ignored their very existence. In regard to the sister arts of sculpture and painting, wherein all found pleasure, the splendid beginning by Mr. Brock in the Memorial in the Mall he instanced as the work of not only a fine artist, but also of a very fine Englishman. Mr. Blomfield proceeded to speak of the benefits conferred by the masters of science, but the remainder of his remarks were inaudible from where our representative was sitting.

Sir Lawrence Alma-Tadema, acknowledging the toast on behalf of Art, said the art of explaining what Art was seemed to be almost impossible; but he always recollected the definition of the King of Sweden at an Academy dinner, that "Art is the flower of the tree of life." He thought that our life would be like the trees in winter if it had not Art to relieve it.

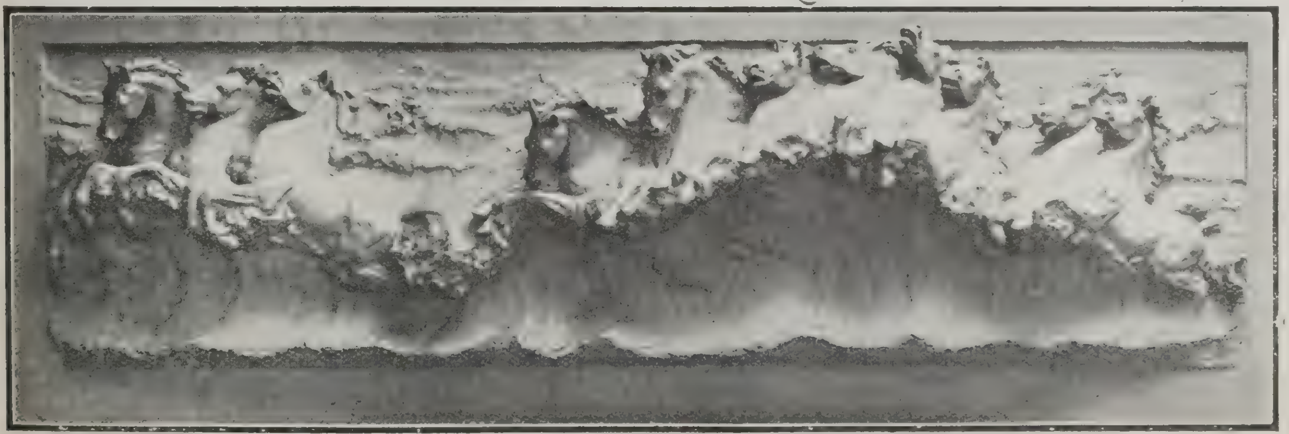
Mr. Henry Morris, President of the Royal College of Surgeons, responding on behalf of Science, said that it was such a comprehensive subject that few men were privileged to speak on more than one branch of it. With regard to surgery, with which he was more immediately connected, marvellous progress had been made in the last 25 or 30 years, and this was due largely to the advance of other branches of science as well as to literature and art, to which the scientist was largely indebted. The goal of science was simple truth; literature aimed at beauty and effect; true art blends the ideal with the actual, and the actual with the real. Science was no sycophant; no flatterer or tyrant. He thought that in the esteem of the world medicine stood foremost. Mr. Morris proceeded to recite the names of Linacre, Radcliffe, Mead, and other past-masters of medicine, who were also identified with the arts, recalling finally the name of Sir Christopher Wren, who was an expert anatomist.

Mr. W. J. Locke, who was greeted with prolonged applause on rising to respond for Literature, said he had been struck with the same difficulty of defining what literature was as that expressed by Sir Lawrence Alma-Tadema in finding a definition of art. Whether literature should be confined to dull history or to the fancies of fiction reminded him of a story of two working men leaning over a bar. Said one, "Bill, why do you mix beer and whiskey?" "Well," replied Bill, "Can't you see? If I drink beer before I drink whiskey I get full before I get drunk, and if I drink whiskey I get drunk before I get full, but if I mix them I get forrader very comfortable." He thought that with a mixture of Shelley and Gibbon, one could get on very comfortably. Mr. Locke alluded to the death of the great chieftain of letters, Mr. Meredith, whose works he always regarded as part of a great architectonic scheme, a scheme with perfectly applied details. He thought his vacant place would be conceded to Mr. Thomas Hardy, who commenced life as an architect, and won the Institute medal in the year before he (Mr. Locke) was born. He always regretted that the Institute Library had not a copy of this essay.

Sir Melvill Beachcroft proposed the toast of the "Royal Institute of British Architects and the Allied Societies." He said the London County Council, of which he had the honour to be chairman, had just completed 20 years of its life, and he thought it had done much for the progress of the metropolis in that time. The London County Council, with its street widenings and its slum demolitions, had done much to improve London architecture, and in that work they had been largely assisted by members of the Royal Institute of British Architects. They had not always been able to follow the advice and suggestions of the Institute; as, for instance, in the alignment of the north side of the Strand widening. Whenever it was practicable to do so they had been glad to follow the advice which the Royal Institute was always ready to give them.

The President's reply was not audible to the members of the Press, but a copy of his speech was handed to us and is as follows: Since their gathering last year the most important event in their history had been the granting by the King of the Supplemental Charter for which they applied. This enabled them to make rules for the better ordering of their own house, for the regulation of themselves, and, they hoped, for the benefit of the community. This revision of the Charter and by-laws was the result of a movement that stirred, if it did not divide, their camp. Architects, especially those in the provinces, found that work which should come to them, too often went to auctioneers, who ventured to include architecture in their sphere of usefulness. This was a trouble, but it must be met by keeping their own work at a high level and by a growing perception of what was good on the part of the public. To have all architects registered had been proposed—(loud applause greeted this remark)—though this would not prevent the employment of outsiders; they would also, he held, have to admit all sorts and conditions of men in practice. They preferred to insist that in future all should enter through the schools, obtaining the diploma or certificate which should distinguish the architect from the quack, and they looked for further legislation to accentuate the difference. The training would come gradually by the wise organisation of the training school, bringing all men into line, and demanding that a standard of efficiency should be attained by those who would enter their Guild. This would be the preparation for Associateship, and Fellows of the Institute would be chosen only from those who had passed through the schools with a sound knowledge of the constructive art, thus insuring the public against ignorance and incompetence. No board of examiners could guarantee that a man was an artist. To meet the exigencies of the hour, the Charter made provision for a new class, to be styled "Licentiates," under which head they hoped to receive into the Institute the large number of practising architects who had outgrown the days of schooling and examination. The subject of Examination had had serious consideration, and on their Educational Board professors of the Universities were working with their best men. Till of late the Institute had not been an educational body, having helped only by the award of the Pugin and Travelling Studentships. A distinct advance had been made in the system of training, and young men would now start with a better equipment than their seniors enjoyed. He hoped they would do better work. Students of ability were coming to the front every year and carrying off the Institute scholarships. It would be a grand thing if some of them had the opportunity of carrying their studies further in a higher school, acquiring a knowledge of what is really great in art. A special school had been suggested for these Diploma men, among whom a distinctive prize—a *Prix de Rome*—would be awarded. They felt that Englishmen should have their School of Rome and be under the influence of the noblest monuments, as well as Frenchmen, Germans, and Americans, who already had that advantage. The Council had been conferring with the existing British School of Rome, and had received a cordial invitation to co-operate in any project. The present arrangements of that school did not, however, accommodate the Institute students, nor meet the requirements that had been formulated for an architectural school; but the Institute Committee, who were considering the subject, would shortly have, he hoped, a definite proposal to bring forward. Hitherto the general public had declined to know anything about architecture as a fine art; a good building had not always been appreciated, nor a bad building found out; but there were indications of a growing knowledge in these matters, and of a higher criticism, to which architects would, he felt sure, respond. Technical schools would increase knowledge and power among skilled craftsmen, but they were not a substitute for a good system of apprenticeship. There was a danger that those who gained a smattering of the arts in such schools would expect to become painters, sculptors, or architects, and so swell the ranks of the useless unemployed. A good mechanic was a nobler object than a bad architect. In passing, he referred in terms of approval to Mr. Burns's Housing and Town-Planning Bill, and to the generous endowment by their guest, Mr. W. H. Lever, of a school of architects for the special study of town-planning. Architects ought to be willing, he considered, in the interests of their art, to sink some of their individuality for the sake of obtaining in towns continuity, harmony, symmetry, and balance. After a passing allusion to the desirability of protecting historic buildings from being "Grimthorped," and to the need for an amended and simplified London Building Act, the President urged the advisability of securing copyright for architects, mentioning that a good client recently showed him with pride a group of cottages that looked curiously familiar, though in strange surroundings. "These," said the client, "are copied from those you did for me on the other side of the park." The chairman added that he had not the heart to tell his informant, good easy man, that he had committed an act of piracy. He concluded by remarking that the Institute was in a healthy and prosperous condition, having now the largest membership on record, here being 2,300 on the roll. They had now seventeen allied societies in the United Kingdom, three in South Africa, one in Canada, and one in Australia. The Institute possessed, moreover, an increasing influence, which, he trusted, had been used for the general good.

The last toast of "The Visitors" was briefly proposed by Sir Aston Webb, the hour being very late. Mr. W. H. Lever, M.P., who replied, laid very great stress on the difficulties attending speculative building, and hoped the architect would be able to devise some way of furnishing good designs for this class of work, as the speculative builder, being deprived of artistic assistance, was covering the earth with streets of mean and dreary buildings. Mr. Lever also referred to the question of town-planning.



"WHITE HORSES": SCULPTURED RELIEF PANEL IN OXYDISED SILVER. F. W. DOYLE JONES, SCULPTOR.

This panel, now on exhibition at the Royal Academy, is designed as a decoration for an oak room at Halsey Hall, near Northallerton. The subject is suggested by Kipling's poem, "White Horses," in which the incoming waves surrounding Britain are likened to droves upon droves of rearing and plunging horses, eddying and wheeling, sweeping and racing over the plains. In the relief is represented the onrush of a turbulent wave, with plunging and rearing horses in the foam.

THE QUEEN VICTORIA MEMORIAL.

Completion of First Portion.

The lower portion of the Queen Victoria Memorial was opened very appropriately on Monday, May 24th—Empire Day—the date of the late Queen's birthday. The portion now completed embraces the marble fountains and basins, retaining walls, sculptured reliefs in bronze and marble, granite paving steps and plateau, as well as the bronze electric lamps. In all, it comprises no less than 1,000 tons of marble and 800 tons of granite. The monument proper in the memorial scheme is wholly the work of Mr. Thomas Brock, R.A., who has given the memorial his undivided attention since the scheme was approved by the King in June, 1902. The portion now disclosed to view is dignified and simple in treatment, the whole with the exception of the granite steps and the bronze panels being carried out in fine Carrara marble. The motive in the decorative panels is emblematical of the sea-power of the Empire. The great panel with its low relief figures of Tritons and Nereids symbolises the sea, and the water of the ponds flowing in a broad stream from weirs under the bronze panels of the pedestals adds to the symbolical effect. The scale of the memorial is heroic, and a welcome departure from the pettiness of the average British monumental design. The erection of the marble work of the great central pedestal is now in hand, and Mr. Brock has completed the colossal statue of Her late Majesty, which is some 18ft. high, as well as the groups of "Justice" and "Motherhood." The group for the fourth side of the pedestal is nearly completed, and the winged "Victory" which surmounts the monument is now being cast. There are also the groups of "Courage" and "Constancy" over the water inlets to be completed. It is expected that the whole of the central feature will be completed by 1910, and there will then remain only the four symbolical groups on the pedestals flanking the steps. Messrs. Walton, Gooddy and Cripps, Ltd., are the contractors for the marble work. The water for the cascades is provided by shallow wells in the gravel at the end of the lake in St. James's Park, with an additional supply from the lake itself, and the quantity required is no less than 108,000 gallons per hour. This is pumped up by engines in a pumping station specially erected in St. James's Park, and after the water has passed through the cascades, and basins, it returns to the lake again. The pumping installation has been specially devised by Mr. E. G. Rivers, M.Inst.C.E., the Chief Engineer to H.M. Office of Works. The roads, gardens, and architectural detail surrounding the monument have been carried out to the design of Sir Aston Webb, R.A.

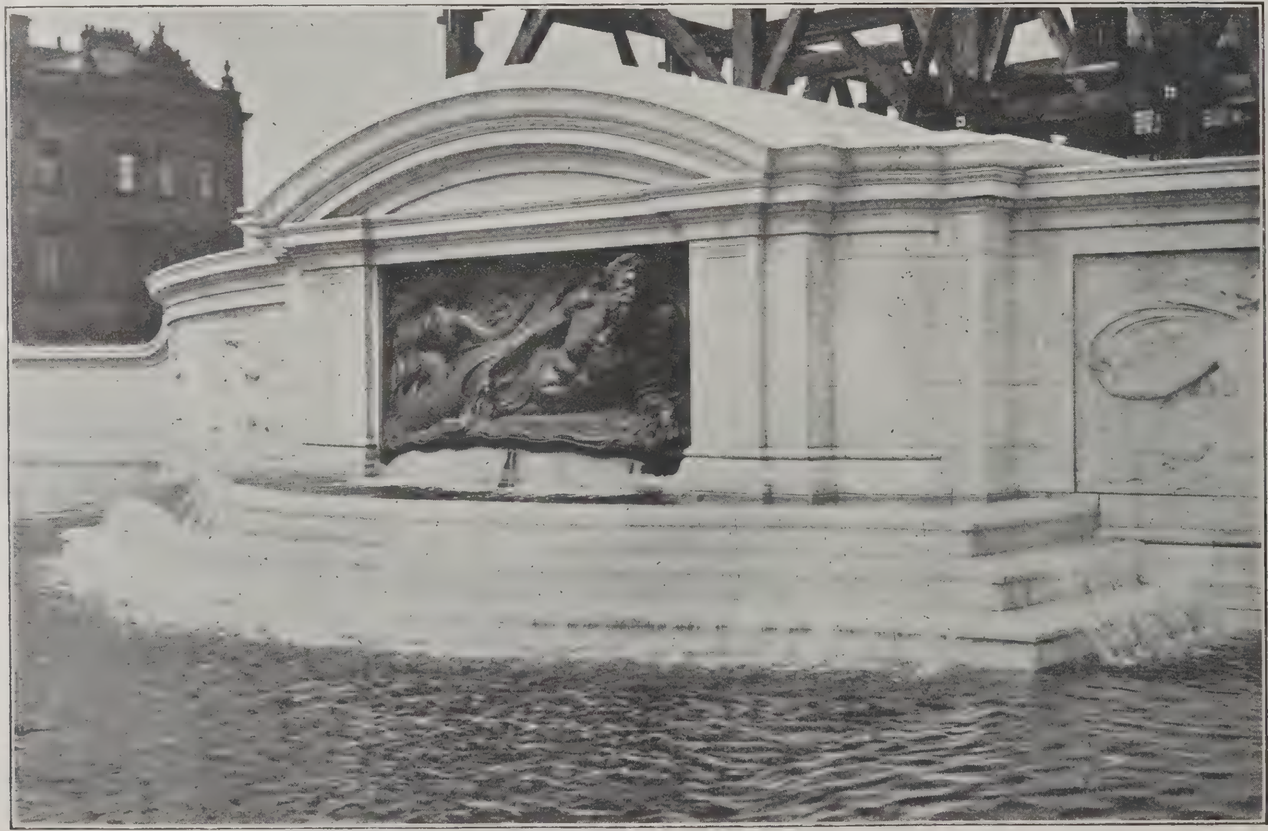
LEGISLATION AND THE BUILDING TRADE.

It is long since the building trade was made the subject of so much legislative enactment as has been lately the case. The last amendment of the Workmen's Compensation Act doubled the already heavy premiums which builders had to pay for insurance of workmen's risks; this was followed by an enquiry as to prevention of accidents, with the result that shortly regulations as to scaffolding, etc., may be expected, which must enhance the cost of construction. Then there are the present Budget proposals as to taxing development land, which, whatever their ultimate result, are likely for the present to upset existing schemes and arrangements, and interfere with building operations for a time; and now we have the proposed compulsory insurance against unemployment, part of the cost of which is intended to fall on building trade employers.

In the meantime, unfortunately, the building industry has been suffering from one of the severest and most prolonged periods of bad trade within living memory, so that, however sympathetic the employers may be to the objects of these various legislative measures, they cannot fail to view with dismay the retardation of trade revival which they seem likely to cause. We hope their fears may not be realised, and that the slight signs of revival shown in places by the unemployment returns mean that a period of prosperity is at hand which will enable employers to face their new responsibilities cheerfully. It is also clear, from the explanations given by Mr. Churchill in the House on Wednesday last, that the formation of the system of labour exchanges will involve a considerable amount of building work; and other social betterment schemes, such as the Town-Planning Act and the Small Holdings Bill, may be expected in the future likewise to promote activity in the building trade.

* * *

Opinions on the Budget proposals in regard to land are filtering through slowly; and on the whole considerable apprehension exists among builders as to the ultimate effect of the new taxes in regard to their business. Sir G. Hayter Chubb gives to "The Times" the experience of a builder who had two or three estimates out awaiting decision; but since the introduction of the Budget he has been informed that none of the buildings will be proceeded with. Consequently, he is paying off 60 of his men. Sir G. H. Chubb also instances the effect of the proposed tax on increased values by the case of a company with which he is connected, which had been negotiating a long building lease at an increased rent. The company is liable for all land taxes, and having been advised that the extra cost, under the new proposals, may be £2,000, have held up their £10,000 building scheme. Lord Redesdale also instances the case of one of the principal builders in the Midlands who lost the chance of three contracts for country mansions through the Budget, the invitation to tender in each case being withdrawn. A builder and estate developer in Surrey, employing 500 men, has also given notice to a large number of his employees, though prior to the introduction of these taxation proposals he contemplated taking on another 200 workmen.



THE QUEEN VICTORIA MEMORIAL, LONDON. THOMAS BROCK, R.A., SCULPTOR.

The illustrations on this and the next page show the lower or completed portion of the Memorial, disclosed to view on Empire Day. The monument is situated at the end of the Mall, opposite Buckingham Palace (seen on the left), and the scaffolding above is that erected for the centre portion of the memorial including the colossal statue of the late Queen now being put up. Over 1,000 tons of the finest Carrara marble and 800 tons of granite have been used for this part of the work.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

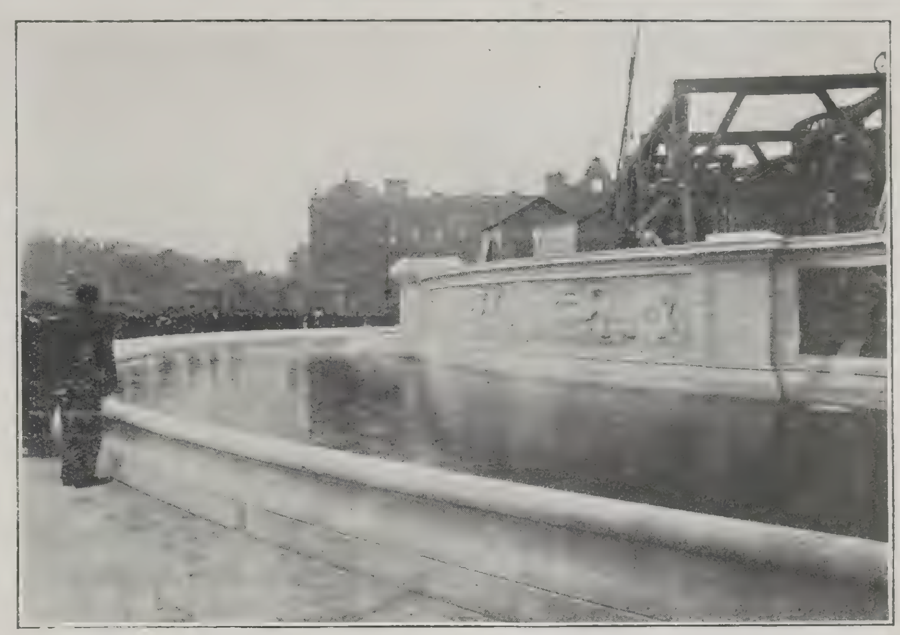
DATE OF DELIVERY.	COMPETITION.
June 4	COTTAGE HOSPITAL, BODMIN. Architects are invited to submit competitive designs for the above, to be erected at an approximate cost of £2,000. Premiums, £12 12s., £8 8s., and £5 5s., for the three sets of plans *which the Committee may select.* Premiums of selected Architects to merge in Commission. Site can be seen on application to Henry D. Foster, Hon. Secretary to the East Cornwall Hospital, Bodmin, from whom particulars are to be obtained.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading, Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second, and third respectively.
June 24	NEW PUBLIC BUILDINGS, BURSLEM. The Architect whose design is placed first by the Assessor will be appointed to carry out the work. Premiums of £100 and £75 to authors of second and third designs, respectively, Conditions and plan of site from F. Bettany, Borough Surveyor. Deposit, £2 2s., returnable on receipt of *bona fide* design.
July 9	STOKE-UPON-TRENT. Additions to Town Hall including large hall to seat 3,000 people, police court, etc. Premiums of £100 and £50 for second and third designs respectively. Assessor nominated by Pres. R.I.B.A. Conditions and particulars from Jno. B. Ashwell, Town Clerk, Town Hall, Stoke-on-Trent,
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50. and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	WALLASEY U.D. COUNCIL. CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

Berkshire County Offices, Reading.

The Council of the Royal Institute of British Architects has received a satisfactory reply to its suggestion for the amendment of paragraph 1 of the printed conditions.—Ian MacAlister, secretary, R.I.B.A.

Grimsby Town Hall Extension.

The Competitions Committee of the Royal Institute of British Architects has received satisfactory explanation in respect of those conditions of this competition which appeared to be objectionable.—Ian MacAlister, secretary, R.I.B.A.



THE QUEEN VICTORIA MEMORIAL, LONDON, THOMAS BROCK, R.A., SCULPTOR.

This view gives some idea of the immense scale of the monument, which is wholly the work of Mr. Brock. The motif of the low relief marble and bronze panels is Sea-power, the figures being those of Tritons and Nereids, and the effect is heightened by the basins and cascades, for which 108,000 gallons of water per hour is required, this being obtained from wells and the lake in St. James's Park, where a special pumping station has been erected. The water afterwards returns to the lake. Mr. Brock was warmly congratulated on his work at the R.I.B.A. dinner last Wednesday.

New Arts Building, Liverpool.

The President of the R.I.B.A. has nominated Mr. E. Guy Dawber, F.R.I.B.A., to be assessor in this competition.

National Museum of Wales.

The assessors in this competition are Sir Aston Webb, R.A., F.R.I.B.A., Mr. J. J. Burnet, A.R.S.A., F.R.I.B.A., appointed by the Directors of the Museum; and Mr. Edwin T. Hall, F.R.I.B.A., appointed by the President R.I.B.A.

Cemetery at Chislehurst.

Mr. Ernest Newton, F.R.I.B.A., has been nominated by the President, R.I.B.A., as assessor for the above competition.

Correspondence.

[*The Editor declines responsibility for the statements made by correspondents.*]

R.I.B.A. and Registration.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—My reason for having given notice to bring forward two resolutions at the general meeting of the Royal Institute of British Architects, on June 7th, are to correct what appears to me to be a wrong impression which has been conveyed to the members of the Institute in the circular letter signed by the president, the four vice-presidents, and the hon. secretary, and posted to every member of the Institute in the envelope with the voting papers.

As a member of the Institute who has followed the registration movement for some years, I am anxious to see its fulfilment in due course. At two general meetings at the Institute, one held on April 3rd, 1906, the approval of an application to Parliament for a Bill was unanimously agreed.

It was then felt that contentious matters should be dropped, as, unless the profession could approach Parliament with practical unanimity, there was little chance of getting the Bill passed.

So contentious matters were dropped, and the committee recommended in their report that "the Institute should confine itself to attempting to obtain Parliamentary recognition for its membership, an attempt which it was believed would meet with very general support."

That belief on the part of the committee was well founded, for their report was unanimously adopted at a general meeting, when it was "resolved, after a revised or supplemental Charter had been obtained, that the Council should prepare and present a Bill to Parliament."

This view was held unanimously on April 3rd, 1906, and was adopted at a subsequent general meeting held at the Institute on March 4th, 1907, as follows:—"The Council have given careful consideration to all the principles above enumerated, and recommend that as a first step a revised or supplemental Charter should be applied for, embodying as many of the principles set forth in Section II. as possible, and that when this has been done, an Act of Parliament should be applied for as soon as possible."

The circular says "as soon as all architects are thus practically united within the Institute, an opportunity will be afforded of considering the possibility of submitting a Bill to Parliament."

To my mind, after the definite and unanimous expression of opinion at general meetings, the wording of the circular conveys an unauthorised change of policy.

Now, to prevent any misunderstanding ocsioned by the circular letter, I am bringing forward the following resolution:—"That in the opinion of this meeting the circular letter enclosed in the envelope accompanying the voting papers for election of candidates to the Council and Standing Committees, does not correctly represent the policy of the members of the Institute as embodied in an adopted report at a general meeting held at the Institute on March 4th, 1907."

My second resolution is:—"That this meeting desires that in future no circular letter be posted in the envelope containing the ballot papers, which has not first received the approval of the Council." I feel that this resolution requires no argument to commend itself. I would, in fact, prefer having the resolution simply put to the meeting without comments. I fear if this form of circularising the members is taken as a precedent, an objectionable custom would become established.—Yours faithfully,

GEORGE HUBBARD.

112, Fenchurch Street, London, E.C.

It is estimated that the cost of a new higher grade school, Wick, shortly to be erected, will approximate £1,000. The mason work alone, which is in the hands of Messrs. Alex. Milne and Son, of Buckie, will account for about £4,000.

THE PENALTY CLAUSE.

By a Barrister.

The object of the penalty clause is to ensure that a contractor shall work to time. It is inserted when time is—to use a legal phrase—of the essence of the contract. Thus, a man will order a certain plant to be erected by a particular date. As the damages which may result from any infraction of this clause are difficult to estimate, a daily penalty may be exacted. In signing a contract which contains a penalty clause, the contractor undertakes a serious responsibility, for he may have, in effect, to pay large damages for what is but a slight injury to the person employing him. Where, however, it could be shown that the damage actually sustained by a breach of contract was very much less than the amount of penalties, a court of justice might interfere to reduce the penalties; but, to use the words of Lord Coleridge: "Where the damage is entirely uncertain, and the parties agree upon a definite and not unreasonable sum, then that sum will be regarded and will be recoverable."

Sometimes the penalty clause, after providing for the payment of a certain sum, goes on: "The same to be regarded as liquidated damages, and not as a penalty." This is an attempt to exclude the jurisdiction of the court to interfere even if the penalty is out of all proportion to the damage done. It has been held that in spite of these words, if the judge sees a method of assessing damages and relieving the party at fault against payment of a large sum, the mere use of the expression, "liquidated damages," does not in any way curtail his power to do so.

We now propose to consider the conditions which, apart from the terms of the agreement, may operate to excuse a contractor from the performance of his agreement within the given time. In the first place, undue interference on the part of an employer, or the imposition of new terms can at once be raised in defence to an action for the enforcement of penalties. Again, an agreement to make certain alterations has a similar effect. In fact, such a subsidiary agreement stops a claim for penalties, unless it be shown that the time spent upon the whole job was unreasonable. Thus, suppose the employer's engineer or architect ordered works to be done which were outside the specification. Unless an express term imposing liability to complete extra work was inserted, the contractor could not be held responsible for any delay so caused. It has been decided, however, that where an agreement to complete works by a certain date contains a clause providing for the execution of any additional works which may from time to time be demanded by the engineer, there is no implied term that the additions shall be such as can be reasonably performed within the time. To avoid a difficulty of this kind, the contractor should pay careful attention to the terms of his contract.

Where an engineer or architect is empowered to order additional works, he is generally permitted to allow extra time for the execution thereof. Should he omit to grant an extension, it appears that the contractor becomes liable to pay penalties for delay in accordance with the original contract.

Payment of penalties is excused in the following cases:—

(a) If the work in hand is totally destroyed—e.g., by fire—both parties being then released.

(b) If the employer (or contractor) cause a delay by interference;

(c) If additional works are ordered.

It may happen that the penalty clause imposes terms of such an onerous nature that the contractor's profits would entirely disappear if his completion were to be delayed for any lengthened period.

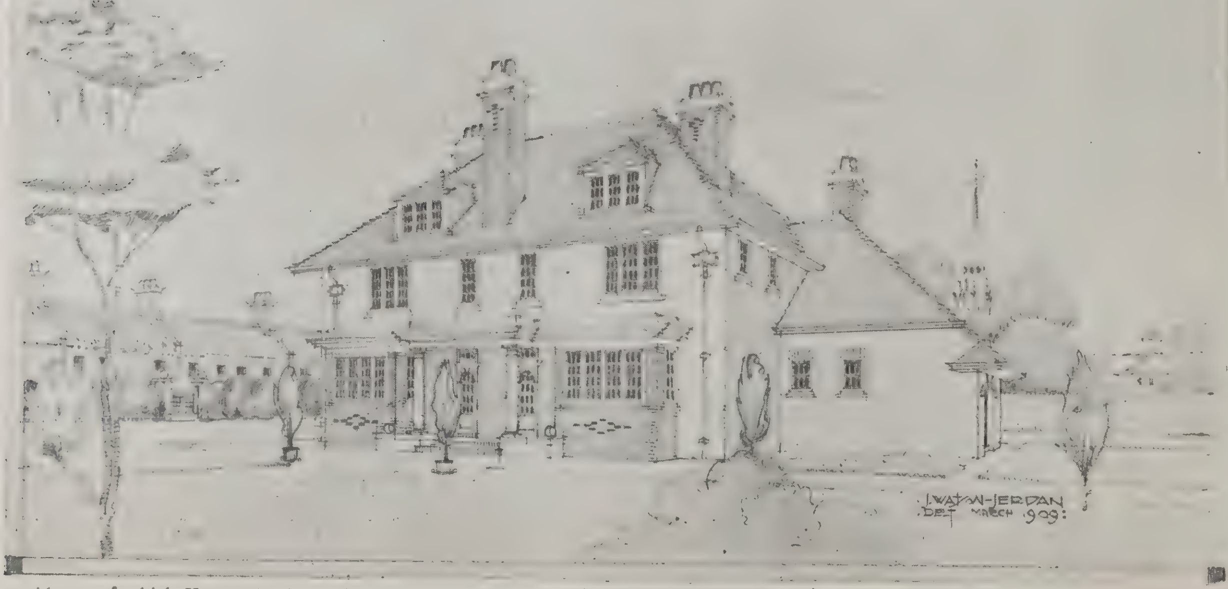
Circumstances might arise which would prevent his completing until a very considerable time after the date fixed by his agreement. What position should he take up? It is conceived that his wisest course might be to abandon the undertaking. In that case the ordinary penalty clause would not apply, as there being no date of completion it would be impossible to assess the amount due. The employer, however, would be relegated to his remedy for breach of contract; but the result of such an action might be far more favourable to the contractor than the payment of an enormous sum in accordance with the penalty clause.

Having said so much in regard to penalties, we turn to the consideration of bonus clauses. It should be stated, at the outset, that these clauses are independent. A contract may well contain one without the other.

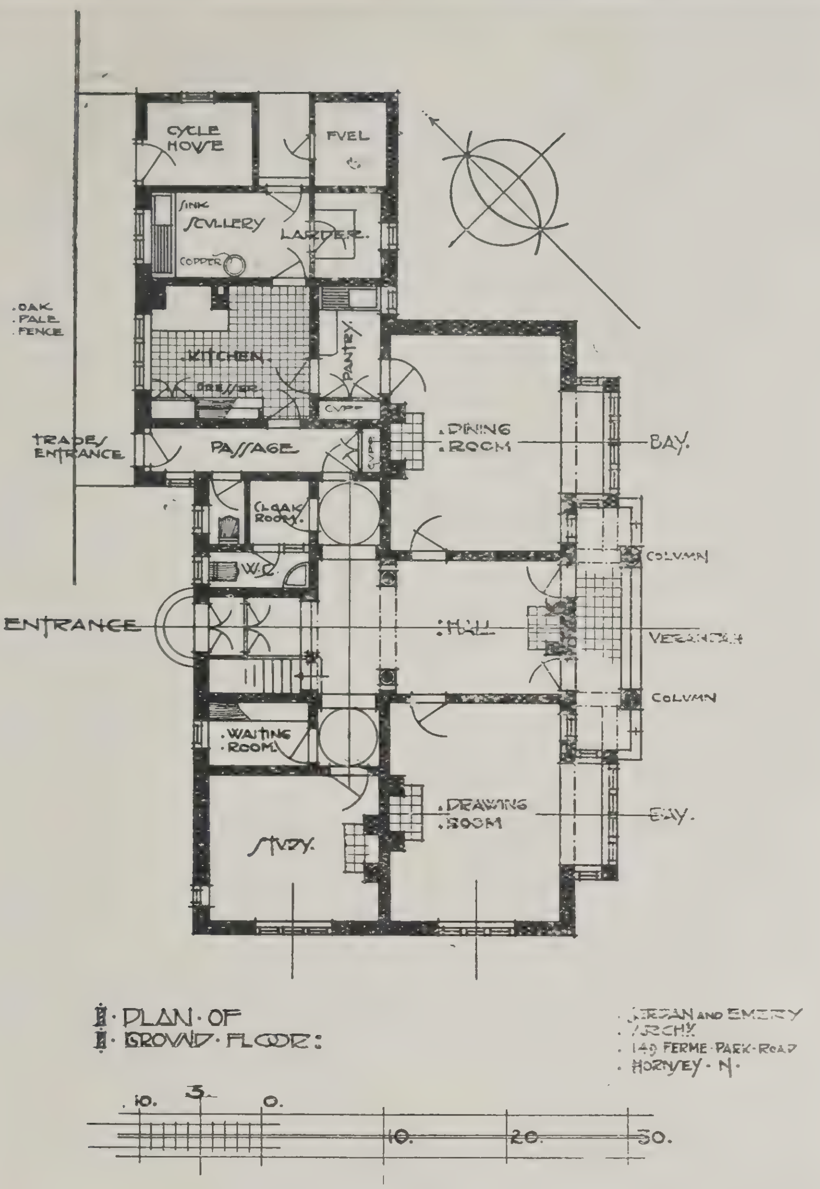
A bonus clause usually provides, that if the contractor manages to complete his work before the time reserved by the contract, he shall be entitled to so much per day for every day in which he is in advance of his time. If by the imposition of fresh terms, or the execution, at the request of the employer, of works which were not prescribed by the original contract, the contractor is unable to earn any bonus, it is a matter of some doubt whether he could recover it. There does not appear to be any case upon the point, but it is conceived that, applying the principles already considered in relation to penalties, if the contractor were in a position to show that he would have completed before the day fixed, but was unable to do so owing to the fault of his employer, he would be entitled to damages. But if he had undertaken to do any extras which might be ordered within the contract period, he would be entitled to no relief, if the doing of those extras made it impossible for him to complete within the specified period.

THE BRITISH FIRE PREVENTION COMMITTEE DINNER.

The dinner of the B.F.P.C. in celebration of the tenth anniversary of incorporation was held in the Georgian Hall of the Gaiety Resturant on Tuesday, May 25th, Mr. Edwin O. Sachs presiding. Among the guests present were the Earl of Londesborough, K.C.V.O., Sir Henry Tanner, I.S.O., Sir James Williamson, C.B. (late Director of H.M. Dockyards), Sir John Cockburn, K.C.M.G., M.D. (late Premier of South Australia), Sir Thomas Brooke-Hitching, Sir J. W. Szlumper, D.L., J.P., His Honour Judge Rentoul, K.C., LL.D., Mr. J. Brandon (vice-chairman L.C.C. Fire Brigade Committee), Captain



This residence, of which Messrs. Jerdan and Emery are the architects (see note on opposite page), has plum-coloured facing bricks of various tints, and Fareham red brick dressings. The chimneys have Portland stone caps. The verandah seen here is constructed of teak.



ST. LUKE'S VICARAGE, HORNSEY.

The object of the plan in this house has been to keep the kitchen and offices well in the background, with the windows away from the garden, while the living rooms overlook the latter.

J. de Courcy Hamilton, R.N. (chief officer, London Fire Brigade), Lieut. Sladen, R.N. (London Fire Brigade), Mr. Sidney Gamble, F.S.I., A.M.Inst.C.E. (London Fire Brigade), Chief Officer J. Meier, Amsterdam Fire Brigade), Chief Officer Reichel (Berlin Royal Police Fire Brigade), Chief Officer Westphalen (Hamburg Fire Brigade), Chief Officer De Marie (Ettelbruck Fire Brigade), M. Phillips (Termonde Fire Brigade), Lieut.-Col. Fox (London Salvage Corps), Lieut.-Col. Seabroke, V.D. (chairman National Fire Brigades Union), Major Cooper-Key (H.M. Chief Inspector of Explosives), Mr. R. A. S. Redmayne (H.M. Chief Inspector of Mines), Mr. George R. Sims, Mr. Ellis Marsland, Mr. H. K. G. Bamber, and many others.

After the toasts of "The King," and "The Sovereigns and Presidents of Foreign States," had been duly honoured, the Earl of Londesborough proposed the toast of the "British Fire Prevention Committee," and mentioned that the committee had been formed after the great Cripplegate Fire in 1897, and was incorporated in 1899. The work of the committee had been wonderful, and it had been scientific work, in which he hoped the general public would take a wider interest. Too often it was thought that fire protection was merely the slapping of water on a fire. He thought it was very greatly to the credit of the gentlemen of the committee that they had carried out so much painstaking work which was entirely honorary, and that they had given their valuable time gratuitously.

Mr. Edwin O. Sachs, replying, refrained from reading the many letters and telegrams that had been received; but mentioned one containing good wishes from Mr. Herbert Gladstone, the Home Secretary, who was prevented by illness from attending; and others from abroad, including one from M. Lepine, Prefect of the Police, Paris. These letters showed that their work was appreciated, and despite the subsidies and grants received by their friends abroad, he thought that they had the finest testing station in the world. The modern fireman thinks of protection and is pleased to see better construction, and with that their work had hitherto been mainly confined. But he thought the time had come for popularising fire prevention, and dealing with matters of direct interest to the "man-in-the-street." The use of celluloid hair-combs, the risks of flannelette, the throwing down of lighted matches were examples of matters to which they could direct the attention of the general public.

Sir John Cockburn, proposing the toast of "The International Fire Service," said that in an international gathering, such as there was that night, there was too often a divergence of view and purpose; but here was one with a common aim. Soldiers donned their uniform for the purpose of taking life; but the fireman's uniform was worn by men who preserved life. Theirs was one of the noblest professions, and a fireman was a popular hero in the imagination of the people. Nothing bound people together like defence against a common foe, and theirs was a fierce, insidious and deadly foe.

Chief Officer Meier, of the Amsterdam brigade, speaking in English, said all the services had the same aim and object, but the practical means of attaining it were different, and because of that they desired to travel and learn. He spoke of their interesting visits to the London Fire Stations and to the Salvage Corps. The International Fire Service Council, over which he had the honour to preside, was not only a union of fire brigades, but other societies were admitted, and the principal was the British Fire Prevention Committee. No society had accomplished so much in so few years.

Chief Officer Reichel, of the Berlin brigade, speaking in German, said that all firemen were members of one great brotherhood. He had opportunities of observing the work of the British Fire Prevention Committee, and he believed it was the best in the world.

Judge Rentoul proposed the toast of "The British Fire Service" in a witty speech, in the course of which he said that the policy of the committee in eliminating opinions and confining their reports to hard facts was contrary to the policy of his profession, which lived by giving opinions, and, very frequently, by obscuring the facts.

Captain de Courcy Hamilton, R.N. (Chief Officer London Fire Brigade) and Lieut.-Col. Seabroke (chairman National Fire Brigades Union), who responded, both spoke of the excellent relations existing between the various fire-services, and the good work done by the Prevention Committee. Capt. Hamilton also gave a short review of the inception and history of the London force.

Mr. Percy Collins, J.P., proposed the health of "The Visitors," to which response was made by Sir Thomas Brooke-Hitching, Mr. George Sims (who gave some statistics of the loss of child life through wearing dangerous flannelette), and Chief Officer Westphalen, of the Hamburg Brigade.

The diners were entertained by some excellent lantern and cinematograph views of the B. F.P.C. testing station and tests, great fires, the parade of the London Brigade in Hyde Park, American "turns-out," etc., arranged by Mr. Ellis Marsland, the Committee's hon. sec. A vote of thanks to the chairman brought the proceedings to a close at a late hour.

ST. LUKE'S VICARAGE, HORNSEY.

The object of the plan in this house has been to keep the kitchen and offices well in the background, with the windows away from the garden, while the principal rooms overlook the latter, each having a sunny aspect at some part of the day. The materials used in the construction of the building are as follows:—The building bricks generally are Flettons, with Luton plum-coloured facings of various tints, and Fareham red dressings; the chimney stacks are finished with Portland stone caps. The back addition is covered with cement roughcast. The roofs are covered with Broseley tiles. The verandah is constructed in teak, left in its natural colour, and well oiled. The remaining external woodwork is in yellow deal, painted white, the windows being glazed with lead glazing. The wood chimney pieces to reception rooms and principal bedrooms are supplied by Messrs. D. E. Brown and Co., of 10, Basinghall Street, E.C., the sanitary goods by Messrs. Twyford, Ltd. The building is lighted throughout with electric light. The builders are Messrs. Sheffield Bros., of Dalston, N.E., the architects Messrs. Jerdan and Emery, of Hornsey, N.

The Leeds local Building Societies are supporting the Leeds Corporation in the effort to get that city exempted from the clauses prohibiting back-to-back houses in the Town Planning Bill. The societies have lent a good deal of money on this class of dwelling, and their mortgage securities will be seriously affected if these clauses are made to apply to Leeds.

NOTES ON PAINTING AND DECORATION.

Points in Paint-mixing.

A great deal of misapprehension exists among those — other than experienced painters—who from time to time are called upon to mix paints; and a recent letter, asking for assistance, brought the fact very forcibly to mind. The correspondent in question had successfully mixed paints for outside use from white lead and such pigments as siennas, ochres, and chromes ground in oil. He had used pure boiled linseed oil and turpentine, and had added as a drier powdered litharge. In mixing his inside paint, he was not successful. Here he wanted a green paint, so he stained white lead with Brunswick green, but found that to get the desired tint at least half of the mixture had to be green. His merchant had recommended him to use green as the base, and to add patent driers instead of litharge. He objects to do this, on the ground that "ordinary patent drier" is usually a lime drier, which "may contain a considerable amount of oxygen in combination with such substances as iron, clay, silica calcium and magnesium, which are not materials we should expect to find in good paint. The first two might be introduced in pigments, but not otherwise." Finally, he asks whether terebine renders paint inelastic.

Some Dangers from Driers.

Now here is material upon which many pages might be written, and we may deal with the most important parts. First as to driers. Litharge should never be employed in the manner described. It is a powerful drier used in drying oils, but to mix it in a pot of paint spells ruin. Each particle, however well mixed, will remain in suspension instead of being distributed thoughout the entire mass by the agency of the linseed oil. When boiled oil is employed, little or no driers are as a rule required; because litharge or some similar substance has already been added to it on scientific principles. We are afraid that our friend's paint will not last, from the very fact that it contains too much driers. Painters say that an excess of driers "burns the life out of paint," and this very nearly expresses the fact. To this excess may be attributed one-half the troubles which arise in painting work.

Mixing Green Paint.

The next point as to mixing green reminds one of the popular delusion that a paint to be good must necessarily contain at least a considerable amount of white lead, while, as a matter of fact, nothing is farther from the truth. Lead makes a good paint for many purposes, because it is easy to mix and to apply, and principally for the reason that it has a good "body," which of course means the property of hiding the surface to which it is applied. But practically any of the pigments, such as the ochres, Venetian red, siennas, blacks, blues, greens, yellows—in fact, every pigment made excepting the very transparent ones, such as the lakes, can be used either by themselves or mixed together without a particle of lead; it is all a question of colour. Then, again, the base might be zinc oxide, zinc sulphide, etc. Greens are almost always used pure and without admixture, excepting when perhaps one wants a very dark green, which can be obtained from chrome, yellow, and black.

Liquid Driers.

Returning to the subject of driers, there can be no doubt that there are a very large number that are of poor quality; but there is no difficulty in getting a good one, and, if used in moderation, the presence of those minerals which are necessarily added to prevent the mass hardening will not be in the slightest degree detrimental to the body or the life of the paint. During the past few years, painters are taking very much more kindly to liquid driers, for two reasons; first they understand how often patent driers are adulterated; and, secondly, because they are aware that if they select a good make of liquid drier or terebine it cannot possibly spoil the work—for one reason, because the paint mixer can measure it to a nicety.

The whole question of paint-mixing is an intricate one; but if the writer wished to have some houses painted and did not wish to put the work into the hands of an experienced master painter, he would not hesitate to use a high-class ready-mixed paint. Some of the brands are so widely advertised that the manufacturers could not afford to give an inferior article. They are mostly combination paints—i.e., are made from an admixture of two or more pigments. Pure linseed oil and pure turpentine are as a rule used exclusively in them, with just sufficient driers—liquid, of course—to cause the paint to dry dust-proof in a reasonable time, and that quantity has been ascertained by exhaustive and careful experiment.

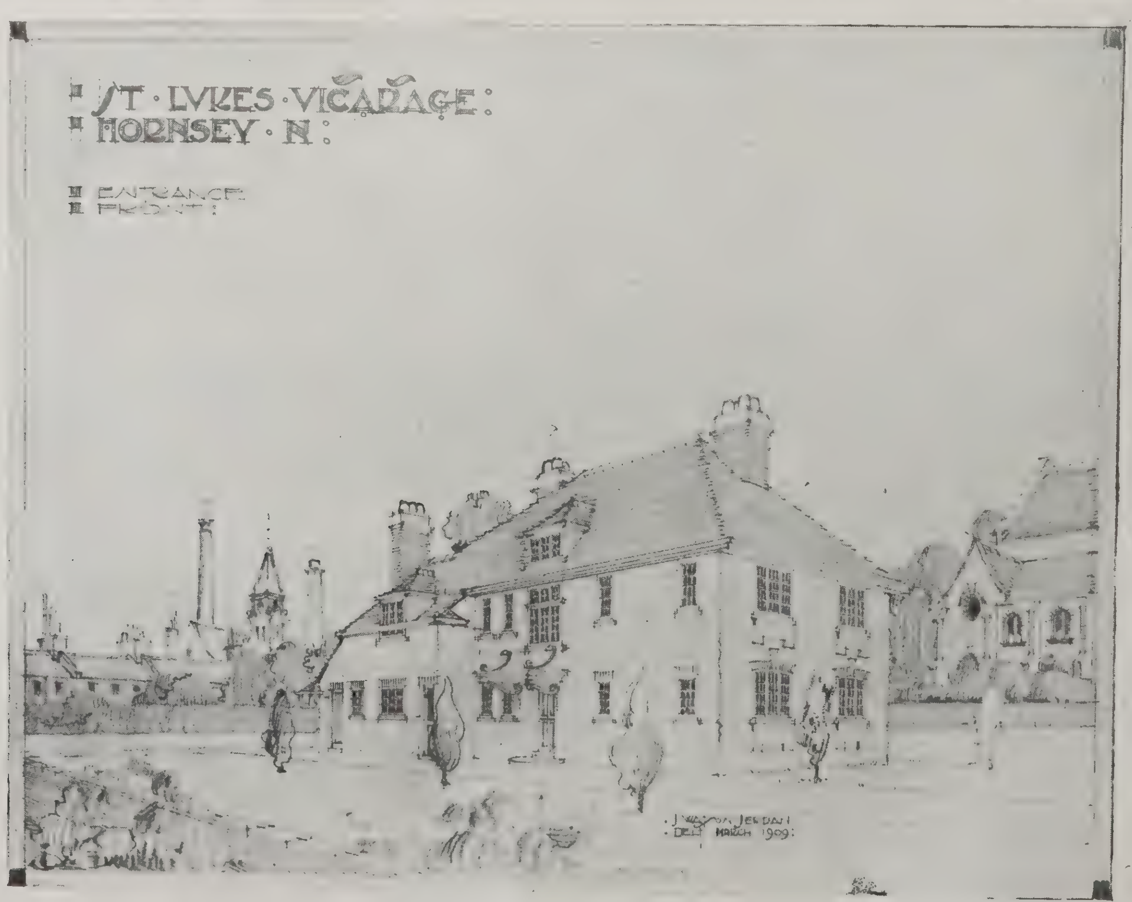
Paint and Pigment.

There are two little slips in our correspondent's letter to which attention may be drawn. He speaks of a drier "containing oxygen." It can hardly do that. Certain materials, of which white lead is one and litharge is another, possess the property, when mixed with a drying oil such as linseed, hempseed, walnut oil, poppy oil, etc., of causing them to absorb oxygen from the atmosphere quicker than they otherwise would do, and hence to dry quicker. When in the form of a dry powder they have no such power, and it is only through the oil that the property can be exerted. For this reason it is far better, if litharge is to be used as the drying agent, to introduce it into the paint-pot in the shape of an oil to which it has been added, and with which it has been very thoroughly incorporated. The other little slip refers to the use of the words "paint" and "pigment." White lead, colours, etc., are all pigments when dry; but they become paints when ground in oil.

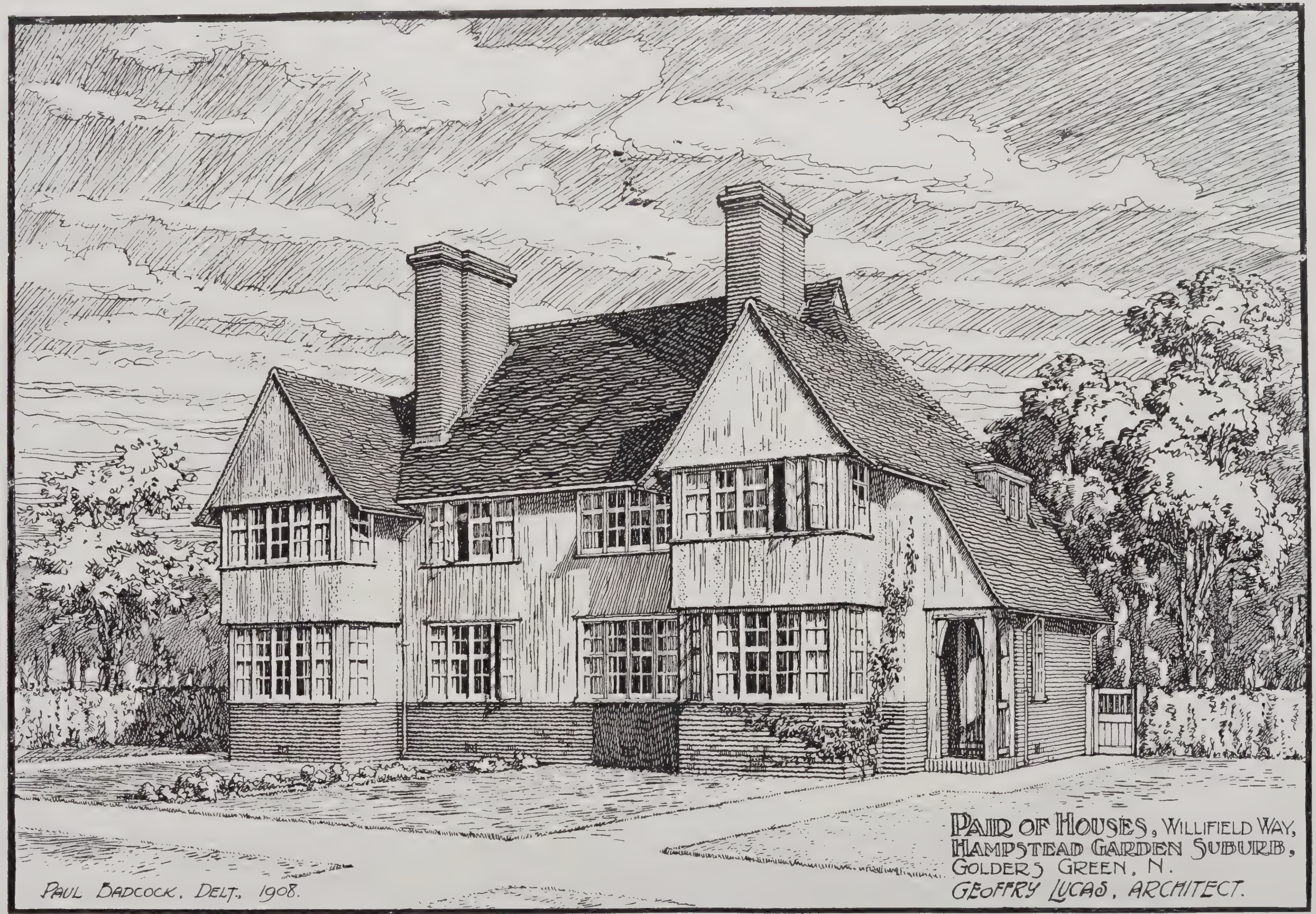
Our Plate.

House at Hampstead.

This house has recently been built in Hampstead Way, Hampstead Garden Suburb, for Mr. C. J. Tait. The house is rough-cast and tiled, and the accommodation consists of porch, hall, sitting-room, and offices, on the ground floor; while on the first floor are four bedrooms, bathroom, boxes, etc. The contractors were Messrs. W. Moss and Sons, of Loughborough and Hampstead, who are

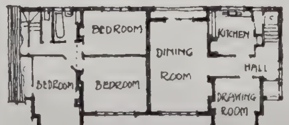


This view shows the entrance front. The roof is covered with Broseley tiles, and the external woodwork is of deal, painted white, the windows having leaded glazing.



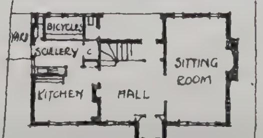
PAIR OF HOUSES, WILLIFIELD WAY,
HAMPSTEAD GARDEN SUBURB,
GOLDERS GREEN, N.
GEOFFRY LUCAS, ARCHITECT.

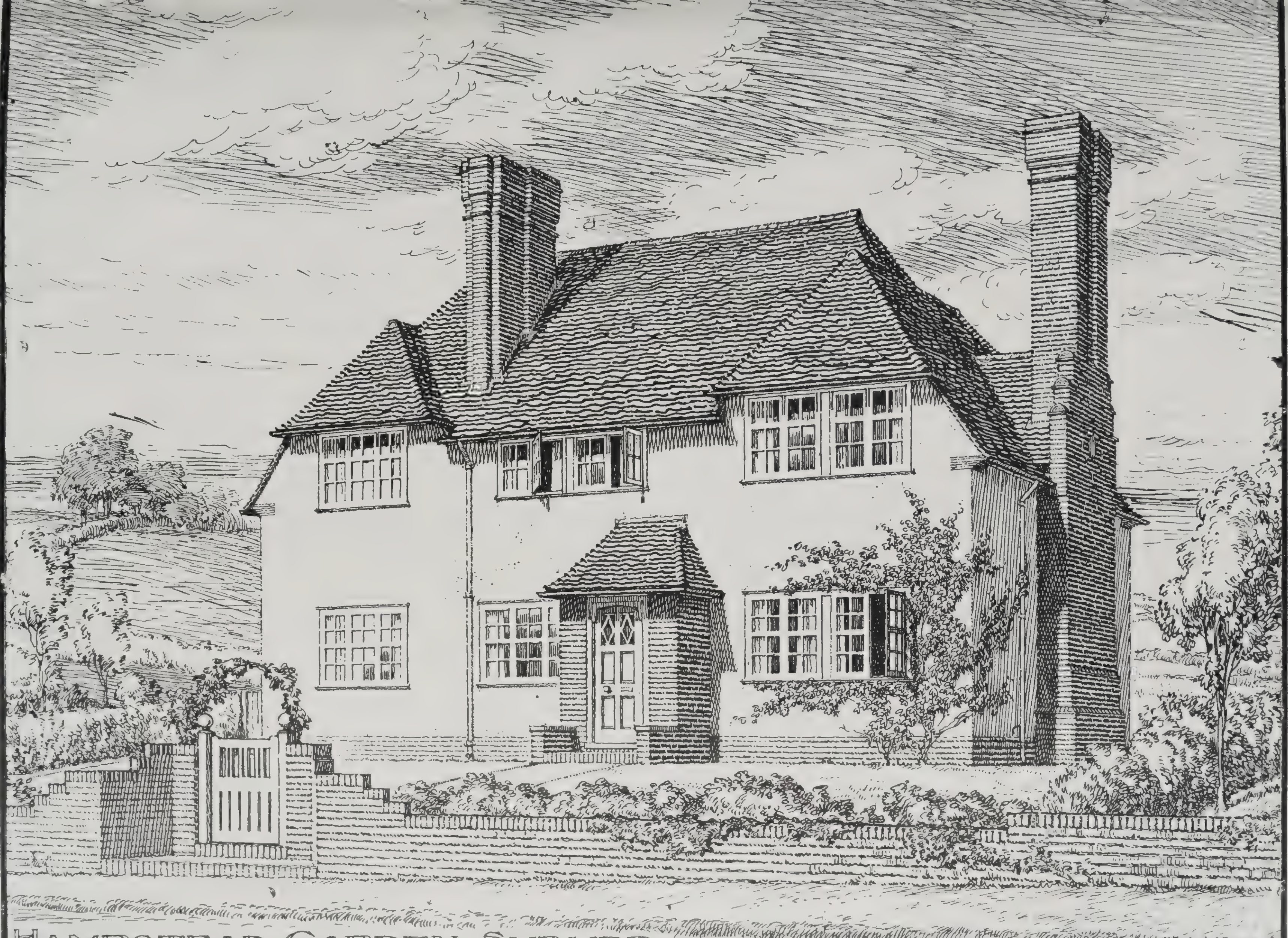
PAUL BADCOCK. DELT., 1908.



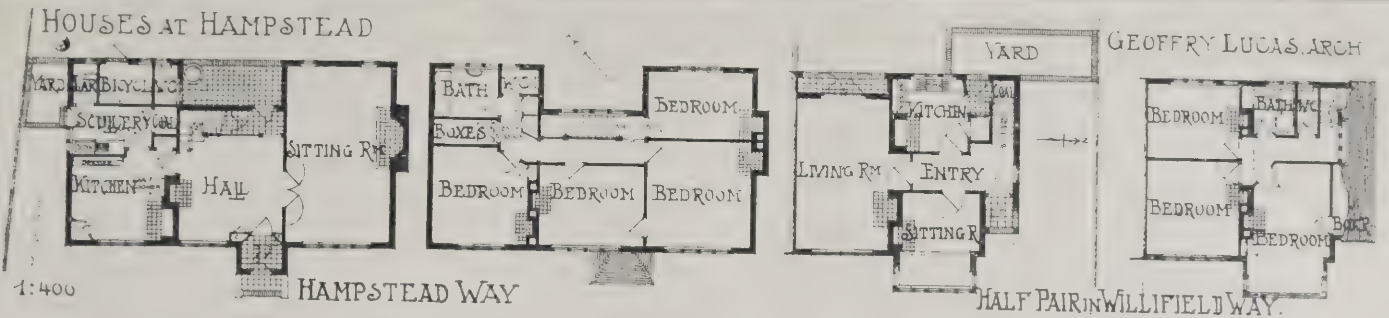
HOVSES AT HAMPSTEAD

SCALE 10 6 0 10 20 30 40 50 60 OF FEET





HAMPSTEAD GARDEN SUBURB.
HOUSE IN HAMPSTEAD WAY. GEOFFRY LUCAS, ARCHITECT



GEOFFREY LUCAS. A.R.I.B.A., ARCHITECT. (*See Centre Plate*).
These are two examples of the better class of house being erected at the Hampstead Garden Suburb.

the contractors to The Garden Suburb Development Company (Hampstead), Ltd., and the architect is Mr. Geoffry Lucas, A.R.I.B.A., of 14, Hart Street, W.C., and Hitchin, Herts. The other houses, in Willifield Way, are of similar design and by the same architect.

Builders' Notes.

A meeting of the Liberty and Property Defence League will be held at the Westminster Palace Hotel on Thursday, June 10th, to protest against the Finance Bill.

* * *

Two districts in the United Kingdom report temporary briskness in the building trade—Harrogate, and Troon, in Scotland. The baths extension and the building of St. Mary's Church account largely for Harrogate's building activity, and at Troon house property and estate development account for the increase in building operations.

* * *

A settlement has been arrived at in the dispute between the masters and operatives in the building trade in West Bromwich. In November last the West Bromwich Master Builders' Association gave notices to the men in practically all departments for a reduction in hours. The local branches of the men's unions thereupon gave counter notices to the employers for a rise in wages to counterbalance the reduction of hours. Several conferences were held between the employers and workmen, and finally the bricklayers, labourers, and stonemasons accepted the revised hours, the employers conceding some alterations in regard to overtime. The carpenters, however, could not come to terms, and the matter was brought before the local Conciliation Board. They were unable to come to any agreement, and the dispute was referred to the Midland Centre Conciliation Board. They sat at Leicester, and finally decided in favour of the employers, the reduced hours to come into operation without any alteration of the rate of wages. The bricklayers, labourers, and stonemasons have already begun to work under revised rules, and the carpenters will also do so as soon as the necessary arrangements can be made. The building trade in West Bromwich will now be on the same footing as regards hours as in Wolverhampton and Birmingham. A similar arrangement has been come to as regards the Liverpool bricklayers, but the rate of wages has been raised from 9¾d. to 10d. per hour.

* * *

PARTNERSHIPS DISSOLVED.—William Dawson, Frank Hall, and Thomas Robinson, painters, decorators, plumbers, etc., trading as W. DAWSON & CO., at 85, Station Road, Hadfield, as and from November 1st, 1908, by reason of death of said William Dawson. Business continued by two last-named partners as "Successors to W. Dawson and Co." William James Jones, of 6, Granville Road, Bedford; George Ephraim Jones, 6, Granville Road, Bedford; and Ephraim Jones, 2a, Littledale Street, Kempston, builders, carrying on business at Bedford and Kempston as JONES BROTHERS, as and from May 15th, 1909.—Emma Harriett Brown, Francis Joseph William Brown and Herbert John Russell Brown, carrying on business as decorators, builders, picture framers, and oil colour dealers, at Bridgewater, under style of E. H. BROWN & SONS, as and from May 8th, 1909.—Thomas Moore and Robert Moore, carrying on business as builders and contractors at Mansfield, Nottinghamshire, under the style of T. & R. MOORE, as and from May 1, 1909. Business continued by the said Thomas Moore under style of R. Moore.

* * *

Mr. Justice Joyce has, on the motion of the Governors of Westminster Hospital, granted an injunction against the Trustees of the Wesleyan Twentieth Century Fund from building the new Wesleyan Memorial Hall to such a height as to interfere with the access of light and air to the hospital. The matter had been referred to Mr. John Slater, F.R.I.B.A., and that gentleman reported that if the proposed scheme was proceeded with, the access of light to one portion of the hospital would be very considerably interfered with. He suggested that the plans should be remodelled. In giving his decision the judge said it was obvious that there should be a speedy trial of the action.

* * *

The "Labour Gazette" for May reports that employment in the building trades in April was slack in all parts of the United Kingdom, except the painters, who were fairly well employed. There was an improvement on March, but it was worse than a year ago. There was an increase of 3.7 per cent. in the number of skilled men employed, and of 5.9 per cent. in the provinces; and in the case of labourers the figures were 10.0 per cent. and 9.7 per cent. respectively. Compared with a year ago there were in London increases of 2.1 per cent. skilled men and 6.5 per cent. labourers. The figures in the provinces show decreases of 12.3 per cent. and 9.0 respectively.

* * *

CONCILIATION CASES.—The Board of Trade appointed Mr. A. A. Hudson to arbitrate in the disputes between the master and operative painters at St. Helens. The master painters had given notice of alterations in the existing working rules, the principal alteration (resulting in a reduction in the number of hours worked per week) relating to starting-time and to the question of breakfasting before commencing work; the operatives were willing to agree to the reduction in working hours, in consideration of receiving an increase in the hourly rate of wages, but objected to breakfast before commencing work. The arbitrator awarded that the men should receive an increase of ½d. per hour (from 8d. to 8½d.), and should breakfast before commencing work. Mr. Hudson was also the umpire in the dispute between the master and operative slaters at Glasgow. The master slaters had given notice of a reduction in wages from 9d. to 8d. per hour; Mr. Hudson decided that the standard rate of wages should be reduced to 8½d. per hour.

* * *

The Belgian builders are expected at Sheffield on August 10th. As the Sheffield builders were officially received at Brussels, it is hoped that the Lord Mayor will give them an official welcome at the Town Hall. In the afternoon after luncheon visits will be paid to representative works, and in the evening there will be a dinner, at which the Sheffield builders will do their best to show that Yorkshire hospitality is at least equal to that of Belgium. Wednesday will be devoted to excursions in the Dukeries, probably; on Thursday morning there will be more visits to works; and the visitors will leave Sheffield for London on the Thursday afternoon.

* * *

Lecturing on "Afforestation" at the Royal Institution, the Hon. Ivor Guest, M.P., dealt with the report of the Commission on Coast Erosion and Afforestation, over which he presided. We imported, he said, from countries having a climate more or less similar to our own, and producing therefore the same classes of timber, wood to the value of over 20 millions sterling a year. On the basis that there were nine million acres of land available for timber growing, and on the assumption that each acre would produce annually one ton of timber when the crop comes to maturity in 80 years' time, and if proper methods were adopted to assure its continuance, this country would produce about the same amount of timber as it now imported. Mr. Guest then referred to the temporary employment which would be afforded in the course of afforesting 150,000 acres a year, which would be about the proper proportion, and to the permanent work that would be provided in looking after the afforested areas. The State's putting money in afforestation would mean almost a 4 per cent. investment, on the assumption that timber remained at its present price, though the price was in fact likely to increase. The Government seemed inclined to make a start in an experimental way.

* * *

In the unavoidable absence of the Hon. Percy Wyndham, Sir William Chance presided at the sixth annual meeting of the Building By-laws Reform Association at the Whitehall Rooms on Wednesday last. A conference with the Rural District Councils Association was reported, the outcome of which was the drafting of a Bill for amending the Public Health Acts for the purpose of giving relief under oppressive administration by means of by-laws. The draft Bill was submitted and approved. The Dowager Lady Lovelace, Mr. Lacey W. Ridge, Mr. C. F. A. Voysey, and Mr. R. A. Read (hon. secretary) were elected to represent the Association at the adjourned meeting of the Conference on the Taxation of Land Values.

* * *

The fifth annual conference of the National Federation of Building Trade Employers of South Africa was held recently at East London, delegates being present from various parts of South Africa. Mr. Reynolds, of Port Elizabeth, was in the chair. In his address the President referred to the depression in the building trade, but expressed the conviction that a United South Africa had a great future before it. The secretary (Mr. J. T. Brown) submitted a report of the year's work. The Congress adopted a resolution recognising the advisability of appointing members in each of the Colonial Parliaments to watch legislation affecting the building trades. Mr. Drake (Cape Town) reported on the progress and development of the national federal insurance scheme inaugurated at the Cape Town Congress, and it was resolved to recommend its adoption by the affiliated associations. The Congress also discussed the practice of merchants giving special discounts to members of building trade associations, and it was resolved to endeavour to secure its practice in other towns than those wherein it at present operates. The question was discussed of entering into negotiations with the various institutes of architects in South Africa for the purpose of securing a reciprocal agreement whereby architects, members of the Institute, shall only receive tenders from recognised members of master builders' associations, who in return will submit their tenders to the recognised members of the South African Institute of Architects. The question was referred as a recommendation to the next Congress for discussion.

* * *

Difficulty has been experienced by the Athy (Kildare) Rural District Council in getting contractors to tender for the labourers' cottages being erected under the Labourers' Cottages Act. Of the 200 cottages advertised, contracts for 120 only have been let, the maximum cost per cottage, £130, allowed by the Local Government Board, being a figure that the contractors say will not pay them. A suggestion was made that, there being no suitable stone in the neighbourhood, concrete should be employed; and the surveyor was instructed to prepare specifications for two concrete cottages as an experiment.

* * *

At the Bradford Technical College on May 22nd, Mr. F. S. Drury (Halifax) read a paper on "Building Calculations: A general consideration of what calculations should be included in a properly organised building course," before the building section of the Association of Teachers in Technical Instruction. Mr. Drury sketched out a syllabus for a four years' course, and pointed out the importance of giving students a thorough grounding in the earlier stages of the subject, as the lack of such grounding rendered them incapable of profiting by the teaching in the higher stages. Discussion followed, and at the close Mr. Drury was heartily thanked for his address.

* * *

In reply to questions from Mr. Mackarness and Mr. Morrell, Mr. Asquith stated in the House of Commons on May 24th that the Government hoped to make provision for the further progress of the Housing and Town Planning Bill after the Finance Bill had been read a second time, and shortly after Whitsun. It was intended to pass the Bill through all its stages this session.

* * *

The members of the Edinburgh Building Trade Exchange paid a visit recently to Whitehill Brick Works, Rosewell, the property of the Lothian Coal Company. On arrival there they were met by the manager, Mr. James Hamilton, who conducted the party over the works, and explained the various processes. On the invitation of Mr. Hamilton, the party was entertained to tea on the lawn of his house. On the proposal of Mr. James Millar, builder, a hearty vote of thanks was accorded Mr. Hamilton for the interesting and instructive visit the members had been able to enjoy.

* * *

The Burgomasters and thirty members of the municipality of Berlin have just concluded a week's visit to the Corporation of London. They have inspected the Tower Bridge and the Tower of London, and were received by the King at Buckingham Palace. Among the items in the week's programme were a banquet at the Guildhall, visits to the public buildings in the City, the British Museum, and the National Gallery, the Naval and Military Tournament at Olympia, performances at the Royal Opera and Palace Theatre, lunch with the Drapers' Company, a banquet provided by the Fishmongers' Company, and a reception at Windsor Castle.

Buildings in Progress and Completed.

AUCHTERDENAN.—The school is to be remodelled and extended at a cost of £2,500. Mr. Williamson, of Kirkcaldy, is the architect, and the following are the contractors:—Mason, Wright and Reekie, Kirkcaldy; slater, Mr. John Robertson, Dunfermline; joiner, Mr. Adam Proudfoot, Lochgelly.

CASTLETON.—A new Primitive Methodist Chapel is being erected at a cost of about £900. Mr. J. Miller, of Bradwell and St. James's Street, Sheffield, is the architect. The mason's work is being done by Mr. J. Elliott, Bradwell; joiner's work, Mr. A. E. Wheat, Castleton; plastering and seating, Mr. J. Slack, Tideswell; plumbing, Mr. Nicholson, Castleton.

CLIFTON.—The Council of Clifton College have decided to proceed with the enlargement of the chapel. Sir Charles Nicholson, Bart., F.R.I.B.A., is the architect, and drawings of the extension are shown in this year's Academy.

DEWSBURY.—A nurses' home in connection with the Dewsbury Hospital is being built at Staincliffe. Mr. A. W. Hanstock is the architect.

EDINBURGH.—Lord Kinnaird laid the foundation stone recently of Lady Glenorchy's new church and halls in Roxburgh Place, to which the buildings have a frontage of 175ft. Messrs. McGibbon and Ross are the architects.

GUISELEY.—The foundation stone of the extension to the parish church has been laid. The accommodation is to be almost doubled at a cost of about £5,000. The original old church is not to be interfered with, openings in the comparatively modern north wall only being contemplated. A new nave, north aisle, chancel, organ chamber, and vestries, are to be built. Sir Charles Nicholson, Bart., F.R.I.B.A., of London, is the architect.

HEBDEN BRIDGE.—A new secondary school has been erected here at a cost of about £7,000.

LONDON.—The new chapel of the Holy Spirit at the Church of St. Peter's, Cranley Gardens, S.W., has been opened. The reredos and the whole of the carved work throughout are the work of Mr. Nathaniel Hitch; the altar, which is of carved oak, has been made by Messrs. Dart and Francis, of Crediton, to the design of Mr. W. D. Caroe, F.R.I.B.A., the architect; and the stained glass windows are by Messrs. James Powell and Sons. The contractors were Messrs. Colins and Godfrey, of Tewkesbury.

PURLEY.—A new wing to the Warehousemen's, Clerks' and Drapers' Schools, Russell Hill, has been erected at a cost of between £5,000 and £6,000.

RYHOPE AND SILKSWORTH.—Model dwellings, consisting of 48 five-room, 24 four-room self-contained houses, and 48 flats of three and four rooms, have been erected here by the R.D. Council. Mr. Joseph Spain, A.R.I.B.A., of 12, John Street, Sunderland, was the architect, and will, with Mr. George Brown, A.R.I.B.A., carry out a similar scheme at Usworth for the Durham County Council. Messrs. J. and F. Parker, of Sunderland, were the builders at Ryhope, and Mr. H. B. Pitt, of Sunderland, the builder at Silksworth. Mr. J. W. White, Sunderland, executed the street works at Ryhope, and Messrs. J. Clark and Sons, of Ryhope, those at Silksworth.

WALLSEND.—The Borough Theatre is being erected at the corner of High Street and Park Road, from the designs of Messrs. J. Fleming Davidson, Willington Quay and Newcastle, and C. D. James, Newcastle, joint architects. The total cost is estimated at £10,000.

WORKSOP.—It has been decided that a chapel shall be erected at Worksop College with a gift of £10,000 from Lord Mountgarret, which was given conditionally on a further sum of £15,000 being raised to complete the College buildings. The response to the appeal for the latter sum has been very encouraging, and the plans of the College, by Sir Aston Webb, A.R.A., and Mr. B. Ingelow, have now been prepared. Lady Mountgarret will lay the foundation-stone in July next. The extensions will be commenced next month, and additional blocks started during the summer.

WREXHAM.—The new St. John's Church is to be built of Cefn stone, and will consist of a nave of four bays, with narrow ambulatories for aisles, and a clerestory with traceried windows. A barrel-vaulted ceiling, a carved oak chancel screen, oak chancel fittings, oak chair stalls, and an oak pulpit are included in the scheme. The church will seat four hundred people, and will cost £6,210. Messrs. Collins and Godfrey of Tewkesbury, are the contractors, and the architects are Messrs. Prothero, Phillott, and Barnard, of Cheltenham.

Proposed New Buildings.

ABBEYDALE, SHEFFIELD.—It has been decided to build the new church of St. Oswald in one scheme. £5,500 of the £8,000 has been raised, and it is hoped the church will be erected by next Easter.

ABERDEEN.—A new market for produce is being favourably discussed, and a site in Exchequer Row has been suggested for it.

BATH.—L.G.B. enquiry has been held respecting a loan of £500 for the purchase of certain premises in Swallow Street as a site for extension of engine house at the Baths. The extension scheme was not fully prepared; but plans have been prepared by Mr. A. J. Taylor.

BEDFORD.—Plans approved:—3 houses, Denmark Street (Mr. C. Rootham); 2 houses, Bromham Road (Mr. E. Casheard); 6 houses, Denmark Street (Mr. D. Francis); house, Veverley Crescent (Mr. R. Jeakings); 4 houses, Chaucer Road (Messrs. Jacobs and Burton); additions to shops, 2 and 4, Kimbolton Road (Trustees of the Moravian Estate); alterations, "Burnaby Arms," Stanley Street (Mr. Chas. Wells); 4 houses, York Street, and 6 houses, Rosamond Road (Mr. H. J. Jones); 6 houses, Honey Hill Road, and 6 houses, Trinity Road (Mr. R. Jeakings).

CAMBRIDGE.—Plans approved: Additions to Bull Hotel, lecture rooms, etc., Garrett Hostel Lane (both for Masters, Fellows, and Scholars of Trinity Hall).

CAMBUSBARRON.—Plans for the new U.F. Church here have been approved.

FOREST TOWN, NOTTS.—Funds are being collected for a new church here. The Duke of Portland has given £2,000 and the Colliery Co. £500 towards a total cost of £4,600. Plans have been prepared by Mr. Louis Ambler, F.R.I.B.A., of London.

LINCOLN.—The Board of Guardians are considering sites for a new infirmary.

LONDON.—The County Council proposes to erect 88 additional cottages on the Norbury Estate, and tenders are to be invited for 105 on the Tower Gardens section of the White Hart Lane estate.

MEXBORO'.—The Borough Council has approved plans for the new Empire Palace in Oxford Road, subject to some alterations to one or two entrances. Plans for 16 houses, Lorna Road (Mr. S. Jackson); 8 cottages, York Street (Messrs. Oliver and Son); 8 cottages, Carlyle Street (Messrs. F. and F. Lazenby); new machines rooms, "Times" Publishing Co.; were also approved.

RHOS-ON-SEA.—At a cost of £1,000 it is proposed to proceed with the school part of the new Congragational centre designed by Messrs. Porter and Elcock, of Colwyn Bay, which gained the first place in the recent competition. The cost of the entire scheme will amount to between £3,000 and £4,000.

SHEFFIELD. — The Managers of the Training College for Teachers recommend that Messrs. Gibbs and Flocton prepare plans for completing the Women's Hostel to provide accommodation for 60 more students; also that the City Architect prepare plans for alterations to the College to provide accommodation for instruction in chemistry, physics, and nature study.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Party Wall.

LONDON, W.—A. J. H. writes: "Under the London Building Act I am entitled (if the adjoining owner will not agree to a party wall) to build an external wall on my own land and allow the footings to project on to the adjoining owner's land; also to have access to his land to build the footings, provided I do so at my own expense and compensate for any damage done. Does this rule apply in the country? I understand that common law there governs these matters."

No, the provisions of the London Building Act do not at all apply to the country, and you are right in thinking that common law there governs the matter. You must build everything on your own ground, and not encroach at all; walls, footings, and verges, all being kept within your boundary line. F.S.I.

Local Authority and Sewering.

CAMBRIDGE.—X Y. Z. writes: "Seven houses are to be erected in an urban district area. The plans have been passed by the local authorities, with the exception of the drainage, for which their surveyor has asked for an amended plan. Drainage was shown to discharge into the sewer of the main road in the usual manner. Unfortunately no sewer exists within a distance of 130 yards from the site. The drains were thus shown with the hope that the council would extend their sewer to the point where wanted, and a letter was written requesting them to do so. They now say that they cannot comply with our wishes. Can the local authority be forced to provide a sewer within reasonable distance of the property?"

There is no legal obligation upon the local sanitary authority to provide a sewer, or to extend their existing system to reach your houses; and unless you can come to some voluntary arrangement with the authority the responsibility of providing for the drainage of the proposed new houses will entirely devolve upon the owner. F.S.I.

Floors for Dancing.

Mr. Percy Fawckner (Newport, Mon.), writes: "In your reply to 'Trichinopoly's' enquiry under the above heading, in the issue of May 5th, you give a plan and section of the floor referred to, and I notice that you show the flooring boards to run tranversely across the room, and not with the length of the room. Surely it is most important that in ball-rooms the boards should run with the length of the room."

On the same subject, "E. C. H.," who has constructed such a floor in a West End Hotel, where it is giving complete satisfaction, kindly offers to furnish the details to "Trinchinopoly," to whose address we will forward them on receipt.

"P. (Croydon)," who requires similar information, is referred to this correspondence.

Responsibility for Drainage Repairs.

SHERINGHAM.—C. A. S. writes: "The drains of a house becoming choked, the tenant called in the sanitary inspector, who ordered that the drains should be relaid. Enclosed [not reproduced] are the clauses of the lease referring to drainage. Who, in your opinion, is responsible for the work, the landlord or the tenant?"

The sanitary authority have full legal rights to serve the notice of abatement of the nuisance on either landlord or tenant, and have powers of enforcement in either case. The ultimate incidence of the burden, however, depends on the terms of the tenancy, and were it not for the clause in the lease which you now quote, there is little doubt but that the liability would fall upon the tenant. The indemnity clause you submit at first sight is certainly a little obscure, but certainly does not appear to me to override the other clause which so clearly and distinctly lays upon the tenant the obligation of keeping the drains in order, and I am therefore of opinion that this expense will fall entirely upon the tenant. F.S.I.

Questions on Paint.

LONDON, E.—VIATOR writes interesting details of his difficulties in mixing paint, and asks for advice and assistance. The points raised are far too many to be dealt with in this column, but as they are of general interest, they have been incorporated in the "Notes on Painting and Decoration" on page 520. It may, however, be here remarked that the practice of adding litharge in the form of a dry powder to a paint is absolutely wrong. It might be sparingly used by a paint-maker, but is quite unsuitable when used by a painter, unless the circumstances are very exceptional. The green should, as the querist's merchant suggests, be used as a base; patent driers, if of really good quality, may be sparingly used with safety, although we prefer a first-class liquid drier. A terebine of really good quality would answer. A teaspoonful to a gallon of paint would be ample. J.

Weakness in Roof Truss.

ELGIN.—SURVEYOR writes: "The enclosed tracing shows a roof that, erected some time ago, now shows signs of weakness. Please state whether the design of the roof is weak either in the scantlings or constructionally. If the roof is weak, what would be the best way to make it safe?"

The design submitted, as shown on the left-hand side of Fig. 1, is too light. As the roof is already constructed, the best method of strengthening it would probably be as shown on the right-hand side of Fig. 1, of which enlarged details are shown in Figs. 2 and 3. The purlins are also not stiff enough, and should be trussed as shown in Fig. 3, the rod being made to do its full work by means of the strut and folding wedges. The buttresses should be increased in projection and height as shown, the added portion being properly bonded to the old work.

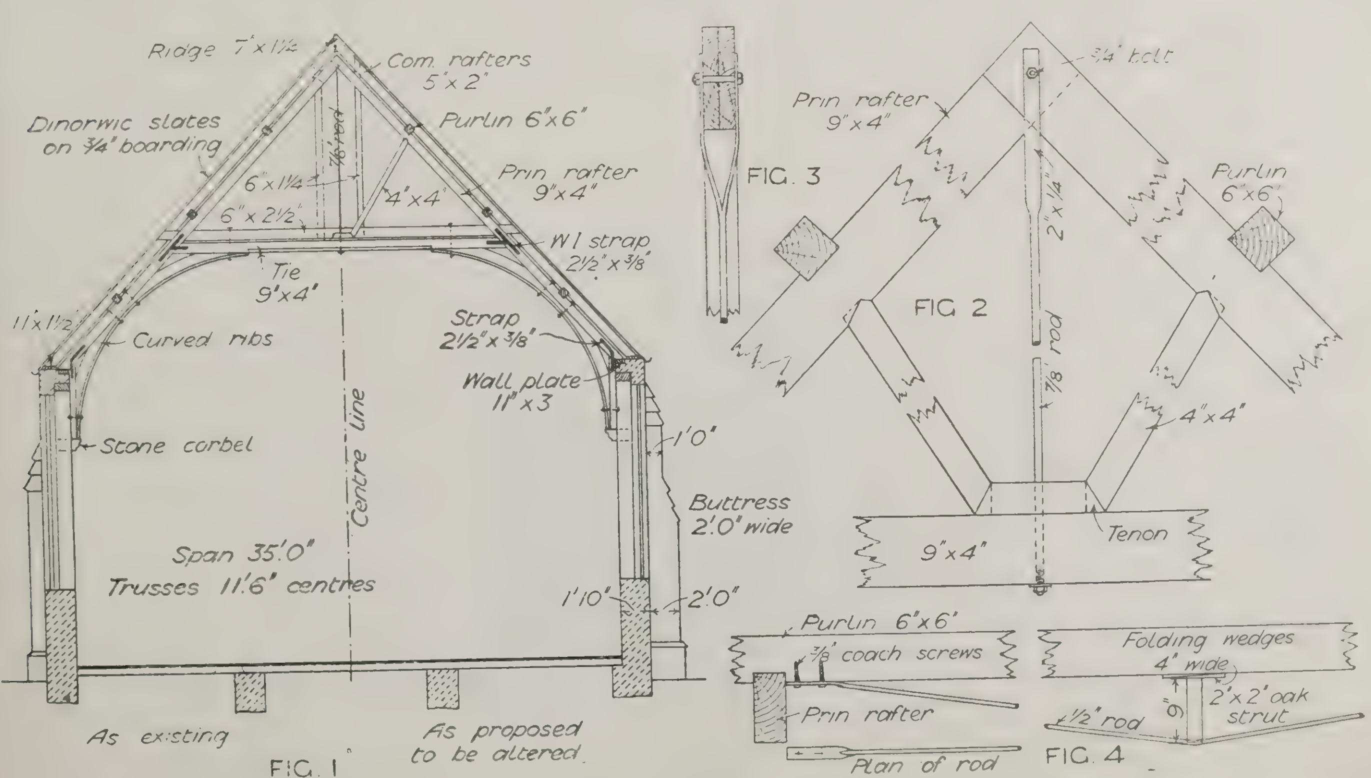


FIG. 1 FIG. 2 FIG. 3 FIG. 4

ILLUSTRATING REPLY TO "ELGIN SURVEYOR," WEAKNESS IN ROOF TRUSS.

ARE DAMP WALLS CAUSED BY BAD CLAY?

By Alfred B. Searle.

The dangers of houses and other buildings possessing damp walls are too well known to need comment, but an interesting view of the situation has recently been published by a medical man whose zeal has somewhat outrun his technical knowledge of building. In an article in a London evening paper he described how he built a house some years ago with bricks which were "faultless to the eye, having smooth, almost shining surfaces and sharp, clear-cut edges and corners." Yet the rooms (which faced north-east) are almost unusable on account of dampness which the owner states does not rise from the ground, but appears to come through the walls. The walls are 15ins. thick, yet the dampness is sufficient to cause the growth of moulds or conferva.

The doctor gave interesting details of a case under his care where a child was troubled with a white growth in the throat, this growth being identical with a similar growth on the walls of the house where it lived. In this case also the bricks appeared to be faultless with smooth and glossy surfaces. It is further stated that other similar cases can be quoted.

We are not concerned with the medical aspect of the question, except in so far as it affects the builder, but the problem presented is very interesting and is well known, particularly in the North and Midlands, though apparently no explanation of it has appeared in print. This dampness is not confined to bricks of one particular class, but is characteristic of several varieties, and is also known in connection with certain varieties of close, dense stone, or with stone which has been protected by an impervious coating on the exterior. It is most apparent when a cold snap comes suddenly after a spell of warm weather, but apparently a number of causes produce effects which are so similar as to make the study of the question by no means simple.

In some cases, certainly, the present writer has found that the dampness is not connected in any way with the material of which the walls are built, but is really a condensation product, the surface of large mirrors in certain disused rooms being covered at times with a mist or dew even when they are quite away from any wall. Rooms with a north aspect are more subject to this dampness for the simple reason that their position makes them normally cooler than the rest of the house.

That the moisture in this case is purely superficial (and therefore the result of moisture in the atmosphere condensing on the interior of the walls and not of dampness coming through them) is shown by the fact that the admission of warm air from another part of the house, or the lighting of a fire in the room in question, will in a very few minutes remove all signs of moisture, whereas in a house in which the walls are damp throughout a considerable time is required for drying.

The doctor's suggestion that the moisture is due to the way in which the clay is manipulated when being made into bricks is quite untenable from a technical point of view, and his implication that bricks made by the semi-dry or similar processes are more porous than those in which the plasticity of the clay has been fully developed is contrary to actual experience. Indeed, the interest of the article lies chiefly in this curious discrepancy between observation and conclusion, and indicates how dangerous it is to attempt explanations unless one is possessed of sufficient technical knowledge.

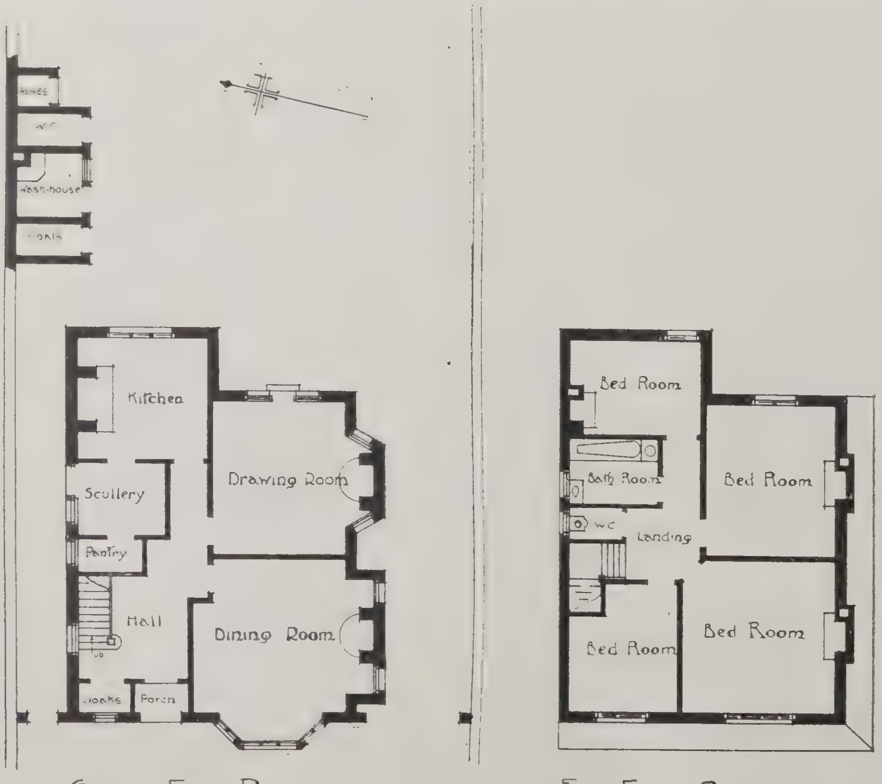
In common with many others, the doctor has observed "the constantly damp north walls of houses built of modern bricks made since the invention of machines for using" semi-dry instead of plastic clay. Yet the dampness of such walls is not related to their porosity at all, but rather to the absence of it. Bricks made of plastic clay are usually very porous—many of them absorbing more than one-seventh of their weight of water when soaked—yet houses built with them remain dry, if the walls are reasonably protected by overhanging eaves, because such bricks can absorb far more water than is likely to come into contact with them from ordinary rain. Indeed, so absorbent are they, that they will actually draw moisture from rooms in their interior, because the outside air is constantly in motion and so dries the outside of the brick, rendering it porous and capable of attracting moisture from the inside of the room.

In such cases condensation on the inner surface of the walls is almost impossible, unless an impervious wall paper is used, as the bricks will absorb the moisture as fast as it is condensed. Further, condensation is less likely to occur as porous walls act as excellent circulators of air and an accumulation of air heavily charged with moisture seldom occurs in cases where the walls are of porous bricks.

It is important here to point out that there is a great difference between porous and broken bricks. In the former the pores or spaces are extremely minute, and are evenly distributed throughout the whole mass; in the latter, on the contrary, fissures and cracks occur in places, but are irregular, and the effect of the brick is entirely different.

It appears probable, if one may trust the opinion of many eminent architects and the conclusion reached by technical men, that it is precisely the porous brick which makes the driest walls, because it acts as a "breather," drawing off moisture from the interior and expelling it on the outside of the house.

Modern methods of brickmaking tend to utilise machinery which will produce a denser brick than was formerly made, but this should not materially affect the damp-



GROUND FLOOR PLAN FIRST FLOOR PLAN

HOUSE AT CROSSENS, SOUTHPORT. REGINALD TINKLER, ARCHITECT.

This house is built of brick, faced with white roughcast, and the roof is covered with dark red san faced tiles. The dressings to the windows and front entrance are of Cefn stone, and the windows ha wooden casements. The cost complete was £500.

ness or dryness of the walls into which they are built, providing the bricks are really well made and properly laid. If this is not the case it is not improbable that moisture which has once penetrated to the interior of a brick of low plasticity remains there for a much longer time than it would in a porous brick, though even this fact (if it could be shown to exist) would not explain why such walls should be permanently damp on the interior, unless it is assumed that whilst it would not dry on the outside it could easily show moisture on the interior surface—a curious paradox which it is difficult to imagine.

The greater cheapness of bricks made by the stiff-plastic, semi-dry and other systems in which the plasticity of the clay is not fully developed makes the return of the days of plastic bricks improbable, and, provided that the other bricks are properly made, undesirable. If it were necessary, bricks could be made almost, if not quite, as porous, when manufactured by the more modern processes as are the older bricks, but the popular demand at the present time is in precisely the contrary direction, and dense, strong bricks are required.

For many purposes these denser, less pervious bricks are superior, and when properly made their very lack of porosity makes them more dampproof than the most porous bricks and provided that they are not used for rooms which are normally far colder than the rest of the house no trouble with dampness (or rather with condensed moisture) should be experienced. Where north or north-east walls are built of impervious bricks greater provision should be made for circulation of the air in the rooms, so that the atmosphere cannot become so heavily charged with moisture.

It will be noticed that it has been assumed throughout that the dampness has not arisen from the ground. If buildings are constructed without a proper damp-proof course nothing short of reconstruction can prevent their becoming damp in some situations. The special case of walls exposed to unusually heavy rain is also considered to be beyond the scope of the present discussion, as such walls should be protected in a special manner.

In short, the nature of the clay used is not of great importance providing that it be worked up properly and so treated that it will make good bricks. Nor, on the other hand, does the porosity of the bricks affect the question seriously, though for the reasons given it often happens that the most porous bricks provide the driest house. When badly made porous bricks are used, defects in their manufacture are, however, of less importance, from this hygienic point of view, than are those made by some of the more modern methods.

Messrs. Hartley and Sugden, Ltd., of the Atlas Boiler Works, Halifax, announce that in order to facilitate and encourage business in London and the suburbs, one of their managing directors, Mr. J. E. Hartley, has decided to reside in London, and thus place himself personally in touch with customers' requirements. Mr. Hartley's city address is 52, Gray's Inn Road, Holborn, W.C. (telephone, Holborn 2346).

* * *

We understand that the 10th publication of "The Committee for the Survey of the Memorials of Greater London," being the 2nd volume of their survey of the Palaces of London, will be ready almost immediately. It deals with the Parish of Chelsea, including Paradise Row and the river front from the Royal Hospital to the Old Church. The compilation has been made by Mr. Walter H. Godfrey, who has had the assistance of well-known authorities on Chelsea, including Mr. Randal Davies, F.S.A., Mr. William Ascroft and Mr. J. Henry Quinn, and the general editor of "The Survey," Mr. Phillip Norman, F.S.A. Copies may be obtained from the Secretary to the Committee, Parliament Chambers, Great Smith Street, S.W.

SCAFFOLDING IN BRUSSELS.

By A. G. H. Thatcher.

Readers who may remember the articles which appeared in our columns last year on types of French scaffolding will doubtless be interested in the attached photographs recently taken in Brussels. Both are built of framed timbers, somewhat on the Scottish system of gabbard scaffolding. The first (Fig. 1) is built around the Colonne du Congrès and gives a good representation of the scientific principles in which scaffolding should be erected, providing for both strength and safety. The platforms are complete, regularly boarded and railed to prevent danger to workmen. Regular stairways are provided, and generally speaking, it would be difficult to improve upon such a structure as this, considering its purpose.

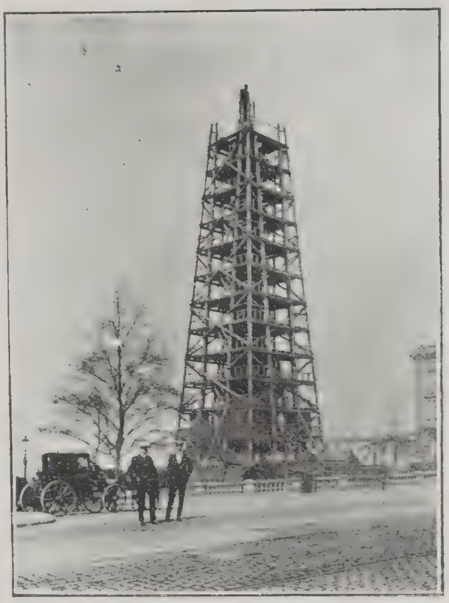


Fig. 1. Framed Timber Scaffolding around the Colonne du Congrès, Brussels, resembling the Scotch gabbard System.

The second photograph (Fig. 2) is more complicated in design, but built to a great extent on the same principles. It was erected for the repair of the Eglise du Petit Sablon. As pointed out before in this paper, the parts of this type of scaffolding are largely interchangeable, so that no great waste of timber occurs, which would at first be thought probable.

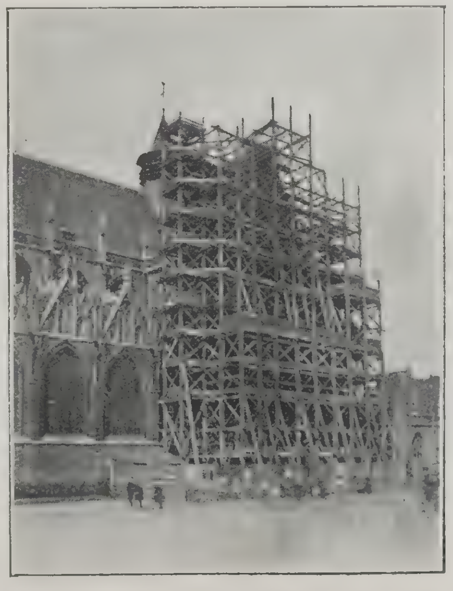


Fig. 2. Framed Timber Scaffolding at the Eglise du Petit Sablon, Brussels. This is not as expensive as it looks, the parts being largely interchangeable.

There seems at present no probability of framed timber scaffolds, except for derricks and gantries being used in this country. The spruce pole still holds its sway. It would be thought that some enterprising builder would effect its use, if only to do away with the hempen ties and lashings which are unreliable when compared with the use of the bolt.

A NEW SUB-CONTRACT FORM.

The following sub-contract form, prepared by Messrs. Ritson and Hope, and confirmed by Mr. A. A. Hudson, barrister-at-law, has been, we understand, approved by the Tees-side and District Master Builders' Association. Its general interest is obvious.

MEMORANDUM OF AGREEMENT made the day of 190 BETWEEN of in the County of (hereinafter called the "Sub-Contractor") of the one part and of in the County of Building Contractor (hereinafter called "the Contractor") of the other part.

[Strike out inappropriate words.] WHEREAS the Contractor has entered into a Contract with (hereinafter called "the building owner") for the erection and completion of the repairs and alteration of in accordance with plans, specifications, Bills of Quantities and general conditions incorporated into the said Contract, which said Contract, plans, specifications, Bills of Quantities and general conditions have been inspected by the Sub-Contractor and of the terms of which he shall be deemed to have express notice and all of which documents are included in the expression "the said Contract" when used hereafter in these presents. AND WHEREAS the Sub-Contractor has agreed with the Contractor for the execution and completion of all work mentioned in the said Contract in accordance with the said Contract and to the satisfaction of the Contractor and of the Architect for the time being employed by the Building Owner or his assigns for the sum of £ to be paid by such payments as are hereinafter mentioned.

NOW IT IS HEREBY AGREED by and between the said parties hereto as follows:—

1. The Sub-Contractor shall execute and complete in manner hereinbefore expressed all the work hereinbefore referred to and all extra work which may from time to time be ordered by the Architect for the time being of the Building Owner or his assigns and shall be paid for all such extra work at the rates contained in the schedule hereto annexed so far as the same may be applicable and where the said rates are not applicable at reasonable rates having regard to the rates in such schedule contained. The Sub-Contractor shall conform and be subject to the provisions of the said Contract so far as the same are applicable to this Sub-Contract.

2. The Contractor will pay for the work hereby agreed to be done in the manner following. The Contractor will on receiving payment of any certificate in which a sum is allocated to the said work forthwith pay the Sub-Contractor the sum so allocated and received by him. On receiving payment of any interim certificate in which no sum is allocated to the said work the Contractor will forthwith pay to the Sub-Contractor such a sum as will with any previous sum or sums paid on account make up per cent. of the value of the said work executed at the date of the giving of such certificate and on receiving payment of the final certificate the Contractor will pay to the Sub-Contractor the balance due in respect of the work. Whenever the Contractor is entitled to receive a certificate on account of work done under the said Contract he shall before applying for or immediately on receiving the same if such certificate has not been applied for give notice to the Sub-Contractor in writing that he is about to apply for or that he has received a certificate as the case may be.

[To be struck out if not applicable.] The Contractor hereby requests and authorises the Building Owner to pay to the Sub-Contractor on demand, any portion of any certificate which may be allocated in such certificate to the work hereby agreed to be done.

3. If the Contractor shall apply for any certificate without having given notice to the Sub-Contractor of such application or if he shall receive any certificate for which he has not applied and shall omit to give notice to the Sub-Contractor that he has received such certificate within two days of the receipt thereof then and in such case notwithstanding anything herein appearing the Sub-Contractor shall be entitled by notice in writing, to forthwith terminate his Sub-Contract and to bring an action forthwith, for the price of all material labour and profit up to the time when he shall have so terminated his Sub-Contract by notice as aforesaid.

4. In case of the insolvency of the Building Owner the Sub-Contractor shall only be entitled to receive such proportion of any dividend or composition as shall be payable to the Contractor in respect of the Sub-Contracting work then done by the sub-Contractor and not paid for by the Contractor.

5. The Contractor shall insure and keep insured the building and works against fire and the Sub-Contractor shall have the benefit of any insurance effected by the Contractor of the work included in the said Contract to the extent that the proportion of work executed by him bears to the total amount of insurance money payable.

6. If at any time during which the works specified in the said Contract are being carried on a claim for compensation shall be preferred against the Contractor by a workman of the Sub-Contractor or any dependant of such workman or any person entitled to payment under the Workmen's Compensation Act, 1906, or any statutory modification thereof on account of any injury (fatal or otherwise) sustained by such workmen while employed on such work then the Sub-Contractor shall keep the Contractor indemnified against such claim and all costs and expenses in relation to such claim. The Contractor shall not settle any claim preferred against him by any such workman or dependant or person entitled by law as aforesaid in respect of which he is indemnified hereby or admit any liability or voluntarily make any payment in respect of such injury but the Sub-Contractor shall be entitled to take the absolute conduct and control at his own expense of all arbitrations or other proceedings in relation to such claim and to use the name of the Contractor to enforce for the benefit of the Sub-Contractor any order made for costs or otherwise or any claim for indemnity against third parties. In case of any claim being preferred against the Contractor by or on behalf of any workman or dependant of workman of the Sub-Contractor in respect of personal injuries whether fatal or otherwise to such workmen where such claim is based on the negligence of the Contractor or of any person or persons for whom the Contractor is by law responsible the Sub-Contractor shall not be liable to indemnify the Contractor against such claim or any costs or expenses in relation thereto nor shall the Sub-Contractor be liable to conduct the proceedings in relation to such claim.

7. In case any dispute or difference of opinion shall arise between the parties hereto the same shall be settled by the Quantity Surveyor for the time being of the Building Owner or his assigns whose decision shall be conclusive and final as to the legal construction of these presents and what is to be done thereunder and the amount of moneys to be from time to time paid or allowed by either of the said parties hereto to the other of them but this clause shall not be construed as in any way limiting the right of action conferred by clause 3 hereof in the event there specified.

Provided always and if such Quantity Surveyor shall refuse to act under this clause the President of the Northern Counties Federation of Building Trade Employers may upon the request of either party hereto appoint somebody to act in his stead who shall exercise all the powers confered upon the said Quantity Surveyor AS WITNESS the hands of the parties.

Signed by the said
in the presence of

Signed by the said
in the presence of

[Here, of course, follow the signatures of the parties to the contract.]

PAINT AND ITS APPLICATION TO STRUCTURAL STEEL.*

By Gaston Depierres

Various theories are expounded by various authors; but, not wishing to add a fresh one, I will only say that my experiments have convinced me that pure white lead paint is not a good protective coating for iron. It is possible to-day to get paint uniformly well prepared for almost any purpose. A painter or paint user of the present time who attempts to mix and grind his own paints is as unlikely to succeed as if he were to attempt to make his own varnish, brushes, etc. It is not my purpose to discuss methods of applying coverings to structural steel, other than to insist that a mechanic to do good work must have good tools to work with, and fair conditions under which to do the work set before him. Many worthy paints are ruined because they are flowed on with a broad, thin, flat brush, not much better than a common whitewash brush, instead of being rubbed out and well into the surface with a good, full, round bristle brush. Then again, painters are apt—if the paint used is a little heavy or the parts to be covered are difficult of access—to add an excess of thinners to save labour, and reduce cost of material.

It is known that the durability of any oil paint depends largely upon the number of particles of pigment, the better protection to the binder and to the metal underneath —the evil of thinning paints too much is therefore obvious. A layer of air exists on all surfaces—hence the importance of rubbing out the paint thoroughly, as otherwise bubbles of air may be discovered which, coming through the paint, render the coating porous.

The Adherence of Paint

would no doubt greatly increase if it were possible to heat the surface by artificial heat; but when painting is done on the job, it is impracticable to warm and dry the metal artificially; however, it is a good plan to apply the paint heated to a temperature of 100 to 120 degrees Fahrenheit, especially when the temperature of the air is below 55 degrees. This is easily attained by placing the cans of paint in pails of hot water. It is important to always note the atmospheric conditions when painting is being done—a temperature of 70 degs. F., and an atmosphere free from moisture, favour the right kind of drying; in fact, the humidity is more harmful than a low temperature. Nothing retards drying more than dampness and darkness.

To aid in the inspection of new work, a shop-coating of linseed oil is often specified. This does, in a measure, protect the iron from rust; but a very uneven film of dried oil is often obtained by this method of treatment. Oil applied to a vertical surface runs off until the layer reaches a certain thickness. When the current meets with an obstruction, it piles up into a thick and uneven coating. The thick parts of the layer may require months to harden into a substance firm enough to be fit to paint over. The results are also most disastrous in cold weather, when oil thickens and contracts, and—as painters express it—"Oil, when applied to a cold steel, crawls, wrinkles, and crinkles."

If oil is used as a primer on steel, it should be used hot, not warm; then it will penetrate the skin of the metal, and we shall probably obtain a thin and even film, hard enough to form a surface to receive paint.

Many places—such as the under and inner sides of girders, boltheads, nuts, rivets, etc., which should be painted with the greatest care to prevent the incursion of water—are often neglected.

To aid inspectors and clerks of works, a proper check upon the workmanship can be secured by selecting different colours for several coatings, so that the uncoated or defective places may be readily detected.

To Secure Durability

with paint, it should always be used fairly thick—and then well rubbed out with the brush into thin and even layers.

From experiment with an ocular micrometer in connection with a microscope, I found that a single coat of dried paint varied in thickness from 1-500th to 1-1,000th of an inch—the difference being due no doubt to the manner of application, that is to say, whether under light or heavy pressure of the brush. We do not realise enough the thinness of a coat of paint, or the strains to which its dried film is subjected.

Much has been said and written of late regarding the apparent failure of paints, enjoying a good reputation, when applied to structural steel. From a limited personal knowledge, and from information gained from others, I am led to conclude that some contractors use less of the paint specified than has been presumed. What they do use is frequently applied in the open, under such unfavourable weather conditions, and under conditions of painting contracts at such a low rate as to preclude the possibility of either employing competent workmen to apply the paint, or such application of same as to prevent corrosion. The best paint in the world illegitimately thinned with cheap oils, Japans or turpentine substitutes, is practically rendered of little protective value; and to apply it to structural steel more or less covered with rolling-mill scale, dew, frost, snow, slush, grease, etc., is waste of time and material throughout.

There is no reason to-day why paint applied to steel should not wear well, provided it is used under fair conditions, applied by honest workmen, and enough time allowed to elapse between each coat. I venture to suggest that the only way to secure better painting is to employ competent and vigilant inspectors and clerks of works, who will carefully superintend the painters' work.

Paint tests may be of three kinds—viz., chemical, mechanical, and physical.

Chemical Tests.

"Chemistry is physic applied to atoms and molecules." A chemical analysis is applied to very small quantities of the substance used, and the accuracy of the results obtained from it depends largely upon the method of sampling. When one considers that all pigments are allotropic, that no two lots of paint liquids are really alike, and that any prepared paint changes more or less in one way or another, with age, the chemist's test is proved to be of value, in so far as it relates to the matter, subject to his analysis and determination; and no further.

The general ideal of a chemist is that of one who can analyse material substances and determine the exact composition. The main study of the progressive paint maker of to-day is now synthetic chemistry; that is, the forming, combining, and reconstructing substances into new forms.

Chemistry can no doubt tell us the things that have been used in making certain paint; it may possibly foretell some of the phenomena that may develop; but I doubt whether it can foretell its *vis viva*—that is, what the paint will do; and what it will do is the only true measure of its value and worth.

"Essentially heterogeneous bodies excite chemical affinity." Can it be supposed that a chemist can possibly know the affinities

---

*** Abstract of a portion of a paper read by Mr. Gaston Depierres at a meeting of the Paint and Varnish Society. An abstract of the first portion appeared on page 301 of our issue for April 7th.**

that exist between the various materials used by the paint maker as well as can the competent paint maker himself? As a logical conclusion, I will say that the quality of a paint depends as much upon its physical as it does upon its chemical properties.

Mechanical Tests.

By this, I mean the tests made by a competent and skilful painter. No one can determine the working qualities of paint as well as the man whose eye, hand, and arm are perfectly trained through practice.

The importance of the proper application of paint receives less attention than it deserves. A poor painter may use 50 per cent. more material than a good painter will use, and get poorer results with it. Engineers and architects should demand the employment of competent artisans to do their painting; for results are quite as much dependent upon the intelligence and goodwill of the painter as upon the quality of the paint used. In confirmation of this, I may say that during all the years the company with which I am connected has been making tests of paints upon roofs, bridges, and test-plates of wood, iron, steel, and glass (while, of course, results have often been non-concordant, and we have noted great difference in durability, covering and drying properties), yet we have never had the paint blister, scale, or peel off. Why, gentlemen? Because each coat has been applied under proper supervision by an expert painter, with thought and care, to a clean surface in a fit condition to receive it; and the paint was, in each instance, protected when drying.

Physical Tests.

By this I mean weather tests, or the exposure of the dried paint or metallic or other surfaces to the destructive forces of nature; such as sunshine, rain, frost, dew, heat, cold, light, darkness, etc., etc., or to agencies which are frequently present in atmospheric air that shorten the life of dry paint, such as acid, gases, and vapours.

Comparative tests on limited surfaces—that is to say, small plates of steel or glass—are often misleading. In order to make such tests more reliable, they should be repeated a number of times to note whether the results are concordant.

Actual service tests under normal conditions give the most conclusive data to guide us; but so long as it takes years to make them, common sense dictates that paint users are right in holding fast to materials that have proved trustworthy until better are found.

Accelerated tests under "abnormally severe conditions" have little value unless the results obtained by the method selected will be in complete harmony with "long time service tests." It is easy to test the effects of artificial heat upon dried paint, but this does not determine with perfect accuracy the power of the paint to withstand sunshine.

No quick test exists to determine the probable life of paint under given conditions; but I believe that one intimately acquainted with the properties of the paint, and with the forces of nature, may reasonably predict its life—if he knows the method of application, the conditions under which it is to be exposed, and the state of the surface upon which it is to be applied.

Efforts have repeatedly been made by various Governments and institutions to establish a standard in the testing of anti-corrosive paints; but when these specifications are carefully studied by a competent paint maker, he soon realises that they fail almost completely to secure that for which they were intended. I dare say, gentlemen, some of you may even call to mind a good many specifications which only possessed the advantage of relieving the monotony of our daily routine by causing much amusement. In fact, some are quite impossible to fulfil.

Guided by the study of phenomena pertaining to subject matter, and reasoning by analogy from practice and experiments, the following conclusions can be reached with regard to structural steel coatings:—

First, that the surface of steel must be in fit condition to receive paint; otherwise it is better to use a cheap paint, tar or anything. Secondly, that to know the probable results to be obtained from the use of paint materials, one must know the following things about them: their history and mode of preparation, their physical properties, their chemical properties. Thirdly, that a competent paint maker can design a paint to meet any reasonable conditions of location, atmosphere, temperature, surface, application, drying and wear; but that in order to do so, he must know the conditions. That these being known, he should be entrusted with the manufacture of a coating to accomplish the result desired. Fourthly, that the priming coat upon the surface is the most important one, and that it should form a perfect foundation for those to follow. Fifthly, that under coats should dry harder and more quickly than those above, and that the difference in drying and elasticity between adjoining coats should not be very great. Sixthly, that the quality of the binder is as important as the quality of the pigment. Seventhly, that the quantity of weight of pigment used is as important as its quantity or volume. Eighthly, that the method of application is as important as the quality of the paint. Ninthly, that no accelerated tests can be the equivalent of a lifetime service test.

Theory is practice applied to atoms and molecules. Practice is theory applied to masses.

Discussion.

Mr. Cruickshank Smith said he was sure they were all agreed that they had listened to a most able lecture from Mr. Depierres. He had given them a brief survey of practically every point that one could imagine in connection with the manufacture and application of a protective paint. He had begun by dealing with what was logically the fundamental subject in connection with protective paints, viz, the foundation or ground on which they were applied, and in dealing with that part of the subject he had referred very briefly to the somewhat contradictory and conflicting theories in regard to the production of rust. He did not propose to discuss Mr. Depierres' paper fully at the moment, but he would revert very briefly to the main headings of the paper in order to elicit as full and wide a discussion as possible. First, there was rust formation, and in connection with that the lecturer had referred to what was a very important matter in modern construction; that was the embedding of large steel and iron girders in cement, and he had made a remark which might be termed the cry of many paint manufacturers, viz., how was it architects and engineers allowed these girders to be embedded in cement without having them coated in a careful manner to prevent corrosion? That was a point on which it would be useful to hear different experiences. After dealing with more or less scientific points, Mr. Depierres went on to deal with the composition of the paint, and he gave it as his opinion that in many cases too much oil was used in thinning the paint, and that a protective paint varied much in ultimate utility in proportion to the amount of pigment spread over a given surface. He thought that was a subject which some present might give an opinion on. Then it would be interesting to hear the expression of opinions on the subject of varnish paints. He thought Mr. Depierres had mentioned that varnish paints were better technically than those paints whose medium or vehicle consisted of oil and turpentine. It was a point on which there was great diversity of opinion. Then there were the methods of painting, scraping, cleaning, etc. There was also the question of ideal binders, that brought them again to the question of their old friend, driers. Mr. Depierres had also touched on the questions of the tendency on the part of certain contractors to carry out their contracts as cheaply as possible; the manner of testing and the matter of specifications. All these points were interesting, and he hoped that all present would contribute as heartily as possible to the discussion.

Mr. Oliver said with regard to the question of embedding steel in concrete, this was thrashed out by the Architectural Association some two or three years ago, and they then proved that steel did not deteriorate in concrete, and that rusting did not take place. They demolished buildings which had been standing some twenty or thirty years, and found that where the steel had been buried in concrete there was no rust present.

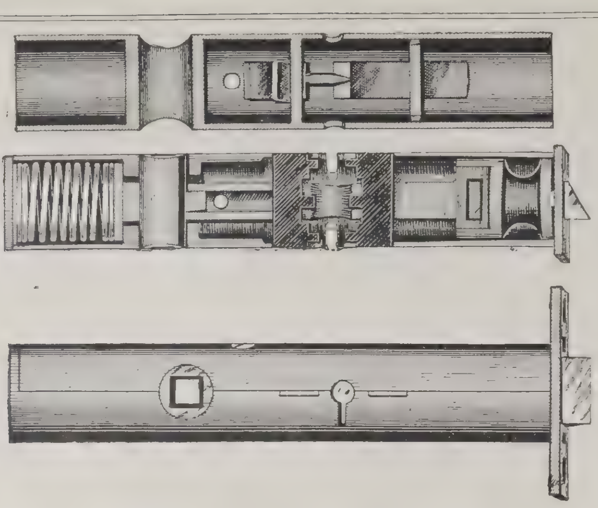
Mr. McIntosh said Mr. Depierres had used no chemical formulæ, and he thought that was a lesson to chemists, as it showed how interesting a lecture could be made without chemical formulæ. With reference to Mr. Oliver's remark, he thought there were recorded some results of experiments conducted in New York where diametrically opposite results to those he had mentioned had been obtained, and it was proved that the steel had corroded. Regarding the cleaning of iron, Mr. Depierres had mentioned hydrochloric acid and sulphuric acid, but he would not recommend the use of sulphuric acid for cleaning iron. Steel varied considerably in its composition, and a paint which would suit one kind of steel would not suit another. There were many processes of making steel, as Mr. Depierres had described, and to work thoroughly, and get at the very root of the matter, he thought a microscopic examination ought to be made of the steel. He was not a steel chemist, but he could see the force of that point. The impurities in the steel formed the nucleus for rust.

Mr. Robertson asked the lecturer whether he could give them some information as to the various grades of oxides of iron that were used in paint making. First they had the native red earths, then they had the artificial oxides, and a third group was the deep reds of the hematite class, and a fourth group was that of the magnetic oxides. Could the lecturer inform them whether magnetic oxides could be obtained in bright red shades?

Mr. Harrison said he was particularly attracted by the remarks regarding the presence of water in paint. He would like to emphasise that because he fully appreciated the difficulty of getting a paint which would be practically free from water. He thought manufacturers sometimes overlooked that important fact. Pigments undoubtedly contained water in varying quantities. He thought Mr. Depierres' remarks on that point were a warning to the trade generally. Another important point touched upon by Mr. Depierres was the inert character of pigments used in making protective paints; that said a good deal for barytes. With regard to red lead v. orange lead, he had taken some photo-micrographs of red lead, and on careful study of this material under a powerful lens he had come to the conclusion that it was a very crystallised substance. If orange lead was examined in the same way it would be noticed that it was much less crystallised, and he agreed with Mr. Depierres that orange lead should take the place of red lead for priming, owing probably to its greater absorptive powers of the oil or binding medium. He did not consider white lead suitable for painting iron. Speaking generally in regard to the question of protective coatings for iron and steel, it was his opinion that there would be no efficient paint for this purpose until they had efficient methods of application. They all knew that iron was a great conductor of heat. A thin film of water was usually found on cold iron, and the painting was often commenced on such a surface, with the result that rusting often occurred. He agreed with Mr. Depierres with regard to the heating. If it were possible to heat the iron, say, to the temperature of boiling water, he thought it would be found that the paint would adhere to the surface better. He should like to ask Mr. Depierres also if he could give them any information regarding the application of paint on the interior of a refrigerator.

(To be concluded.)

Mr. Samuel Thomas, of Manchester and Ansdell, has been selected by a special sub-committee of Blackpool Corporation for the office of quantities surveyor for the new Carnegie Public Library and Grundy Art Gallery.



THE STEVENS PATENT MORTICE LOCK.

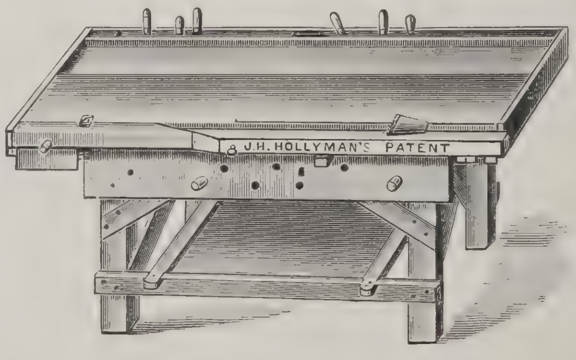
A lock that is constructed on a new principle, and is remarkably compact and strong, and of simple mechanical action. It has a spiral spring, and works with extraordinary smoothness.

A NEW MORTICE LOCK.

A mortice lock of unusual merits, of which a sample has been shown to us by the inventor, Mr. Arthur C. Stevens (the Stevens' Patent Lock Co., 199, Strand, W.C.; works, Willenhall, Staffs.), is shown in the accompanying illustration. The follower moves entirely without friction in a wide solid bearing; and, by the adoption of an entirely new principle, the bolt is drawn back by a projection on the side of the follower, the simple mechanical action ensuring the utmost smoothness of working. Other points in its favour are the simplicity in construction and action of the reversible bolt; the even running, rigidity, and superior durability of the spiral spring, and the ease and simplicity with which the lock can be fixed without mutilating or weakening the door, and without the worry of distinguishing between right and left hand opening. The wearing parts do not get out of order, as the action is almost frictionless. It is also impossible to unlock the door surreptitiously without using the proper key. Simple, compact, designed on sound mechanical principles, with no element of weakness, and sold at a low price, this lock is likely to become exceedingly popular.

AN IMPROVED WORK BENCH.

The "Hollyman" patent work bench, of which an illustration is here given, embodies many improvements on the old type of woodworking benches. Its main features being the patent gripping attachment, which, with the front edge of the bench, forms an instantaneous grip vice. It altogether dispenses with the familiar and clumsy bench-screw, all boards, battens, and the like, being clamped in a perfectly upright position, and evenly and rigidly gripped on both sides and along the whole length. The action may be compared to a parallel ruler. The work, when inserted, is fixed by the wedge-shaped front end of the sliding jaw being pushed forward, thus being made to engage with a corresponding recess, while at the back end there is a projecting arm underneath, working in a slot, in a direction parallel to the angular recess, so as to control the movement of this sliding jaw. The gripping power is surprising. There are no screw threads to wear out, and there is no part that can get out of order. Immediately under the front edge of the bench-top, and at intervals, are wooden supports, each turning on a screw centre for the purpose of being made as occasion requires to project below the opening of the vice to form a base for supporting work. Hence it is quite impossible for wood to slip down when under pressure of a plane, hammer, and chisel, etc. For example, the edges of two or more pieces can be planed together without the slightest fear of any of them slipping either down or sideways; thus turning them out all of exactly the same width. The work is released by withdrawing the sliding jaw by a knob attached to it. Along the inner edge of this sliding vice is a rebate, which is convenient for supporting lathes, mouldings, and any work narrower than the thickness of the bench-top. The projecting batten (at the back end of the bench, and on which the back end of the slide rests) has a step cut on it to prevent wood which is being planed backwards from slipping out. The holes in the side of the bench receive pegs (supplied with the bench) for supporting boards of various widths when edges are being planed, or holes are being bored, etc. There are two bench-tops, front and back. The front stop (Hollyman's improved registered) is of conical shape, about 2¼ins. long, and with teeth round the larger end. It revolves eccentrically upon a steel spindle let lengthwise into the bench, and can be instantly adjusted to any height simply by moving it round with thumb and fingers (a set screw bearing on the spindle keeping it into whatever position it is put). These rotary stops can be fitted to any bench. The back or tail stop is used in conjunction with the sliding parallel vice. It is formed of a piece of T-iron about 4½ ins. long; the upper part having teeth at one end, while the "stem" is held in the patent vice, which grips it firmly at any desired point along the bench. It holds down the back ends of boards that are being planed or carved, superseding the old-fashioned bench knife. There is a trough for tools, etc., and as the bottom of this is not a permanent fixture, it can be brought flush with the bench top by a simple arrangement, thus widening the surface. For holding tools there is a rack at the back, a tray underneath, and a drawer at front end; and if an instantaneous grip metal vice be required to be fitted to the bench, the drawer should be removed for that purpose. These benches are made in any size from 66ins. long, 24ins. wide, and 30ins. to 34ins. high. For use in technical schools (where it has been already adopted), double benches are constructed for two students to work at.

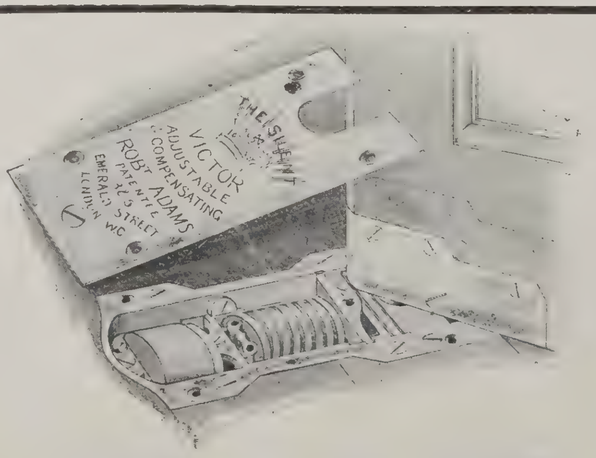


THE HOLLYMAN PATENT WORK BENCH.

This bench dispenses with the clumsy old screw-vice, and, besides an instantaneous gripping attachment, is fitted with many other ingenious arrangements.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.

PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE,
with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.

60 HIGHEST AWARDS.

The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing.

— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

THE NATIONAL FEDERATION OF BUILDING TRADE EMPLOYERS OF GREAT BRITAIN AND IRELAND.

OFFICERS, ETC., 1909.

President:
ERNEST J. BROWN (LONDON).

Senior Vice-President:
COUNCILLOR S. SMETHURST, J.P. (OLDHAM).

Junior Vice-President:
J. W. WHITE (SUNDERLAND)

Hon. Vice-Presidents:
ROBERT NEILL, J.P. (MANCHESTER).
J. HOWARD COLLS (LONDON).
COUNTY ALDERMAN J. BOWEN, J.P. (BIRMINGHAM).
T. F. RIDER, F.R.G.S. (LONDON).
J. STEVENSON JONES (LIVERPOOL).
ALDERMAN W. HOLDSWORTH, J.P. (BRADFORD).
A. KRAUSS (BRISTOL).
B. I. GREENWOOD (LONDON).
C. W. GREEN (LIVERPOOL).
ALDERMAN W. H. JESSOP, J.P. (HUDDERSFIELD)
WM. SHEPHERD (LONDON).
GEO. MACFARLANE (MANCHESTER).
WM. NICHOLSON (LEEDS).
C. H. BARNSLEY (BIRMINGHAM).

Hon. Treasurer:
JAMES WRIGHT (NOTTINGHAM).

Hon. Auditors:
F. HIGGS (LONDON) AND W. THOMAS (CARDIFF)

Representatives on the Employers' Parliamentary Council:
ERNEST J. BROWN (LONDON). WM. SHEPHERD (LONDON).

ADMINISTRATIVE COMMITTEE.

Ex-officio Members:—The President, Vice-Presidents, Hon. Treasurer and Hon. Auditors.

ELECTED MEMBERS.

Northern Centre—T. WILKINSON (Middlesbrough). W. R. THOMPSON (Dewsbury). GEORGE MACFARLANE (Manchester). JAS. STORRS, J.P. (Stalybridge).

Midland Centre—H. WILLCOCK (Wolverhampton). ALBERT S. SMITH, (Birmingham).

South-Eastern Centre—WM. SHEPHERD (London). W. F. WALLIS (Maidstone). B. I. GREENWOOD (London). J. BELL, J.P. (Cambridge).

South Western-Centre—Coun. W. N. BLACKBURN (Newport, Mon.). E. J. NEALE (Bristol).

Secretary:
A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

Trade Boards Bill

On May 4th a deputation from the Employers' Parliamentary Council had an interview with Mr. Churchill at which representations were made as to the facilities contained in the Bill to extend its operation to other trades; this the deputation urged, should not be done without the direct sanction of Parliament. Mr. Shepherd said that the trades scheduled for the immediate application of the provisions of the Bill had been so scheduled as the result of an investigation which had afforded them an opportunity to be heard, and it was only right that other trades should only be scheduled after they had been made the subject of an investigation and had been allowed an opportunity to be heard also.

Mr. Churchill indicated, that while it was necessary to have some means provided for extending the operations of the Bill to certain other trades, it was not contemplated to extend them to properly organised trades having machinery for settling such matters themselves; and that he was in sympathy with the object of the deputation, and would propose certain modifications in committee which would, he thought, prove an adequate safeguard. On May 17th Mr. Churchill gave notice of the promised amendments with the object of securing that the provisions of the Bill shall only be extended by means of an Act of Parliament to other trades than those specified in the schedule. It is proposed that the Board of Trade shall have power to make a provisional order applying the Act, and shall afterwards present a Bill confirming the order. It will then be open to all parties interested to present petitions which will go before a Committee of either House; or, if the two Houses so order, a joint Committee of both Houses. The petitioners will appear by counsel in the usual way, so that all questions involved will be thoroughly considered. In spite of some opposition from the Labour Party, this amendment was carried in Committee.

Annual Return of Membership and Number of Men and Apprentices Employed.

Forms, for the 1909 return, have been sent to each Federation in sufficient numbers to enable each member to make the above return. The forms have been simplified, and so arranged that members may make their return under a reference number without appending any signature. It is hoped that the greater privacy so secured will induce all members to assist in making these returns as complete as possible.

Checkweighing Bill.

The attention of the County Federations has been called to the above Bill, with a request for any observations they may desire to make thereon.

N.A.O.P. Agreement.

A further meeting of the Joint Committee under above agreement was held May 25th, when the Sub-Committee's report was considered, slightly amended, and finally unanimously approved and remitted to the parties to the agreement for confirmation. The revised draft somewhat amplifies the scope of the agreement, while a re-wording of clause 5 has been adopted with the object of making the document clearer. Rules of procedure based on those in use in the Conciliation Scheme have been added, and provision has been made for the annual constituting of the Joint Committees under Rule 5.

National Board of Conciliation.

The annual meeting of the above Board was held May 25th. In addition to the usual formal business, an appeal of the carpenters and joiners of Swansea was heard and decided. The operatives asked for an advance of 1d. per hour and some reduction of the working hours; the employers also asked for an alteration of the winter hours but on different lines. The decision is that the wages remain as at present, but that the hours be altered in accordance with the notice given by the operatives. Notices by the Northern Centre for amendments and additions to rules were considered. It was decided that the rule as to voting should remain as at present. The rest of the proposals were adopted.

The resolutions of the National Federation as to the terms on which builders' labourers could be admitted to participate in the Conciliation Scheme were considered and adopted.

Two suggestions involving future amendments of the rules were considered and approved, and will now be remitted to the parties to the agreement for consideration, so that if desired the necessary six months' notice may be given in October.

Meetings of the Contract Sub-Committee and Bureau Sub-Committee have also been held.

Organisation.

The president and secretary visited Tunbridge Wells and conferred with some of the builders of that district with a view to the formation of a builders' association. The gentlemen present asked to be furnished with the necessary details to enable them to consider the proposal, and it was agreed to hold another meeting on June 8th to go further into the matter. Meanwhile they would speak to other members of the trade.—A. G. WHITE, Secretary.

The Northern Centre.

Lancashire, Cheshire and North Wales Federation.

BARROW-IN-FURNESS ASSOCIATION.

Secretary: J. Baker.

The monthly meeting of Barrow-in-Furness Master Builders' Association was held on April 27th. Before the commencement of the formal business of the meeting the Chairman referred to the death of Mr. Alderman Cox, who had been connected with the association ever since its formation. A vote of condolence with the widow and family was passed.

The matter of binding apprentices was discussed as raised by the operative plasterers, but final settlement was deferred.

The question of w.c. accommodation for workmen on building jobs was also dealt with in consequence of correspondence between the town clerk and the local trades council.

A sample of a calendar for the use of members, and with a view of keeping before the public works, offices, and general public a list of the members of the association, was submitted by the secretary and adopted. Three new members were balloted and unanimously accepted, and two other new ones were nominated.

It was resolved to subscribe to the fund being raised towards a testimonial for the retiring national treasurer.

It was arranged to hold meetings during the ensuing month of the rules revision committee and retail prices committee.

BURNLEY AND DISTRICT ASSOCIATION.

Secretary: C. Astwood.

The half-yearly meeting of the Burnley and District Association was held on Tuesday, April 20th, Mr. Samuel Smith presiding.

The Federation reports were read, also the circular relating to the proposed changes in the Administrative Committee, and it was deemed advisable to leave this arrangement with the Executive Board.

In the secretary's report for the half-year it was stated that the committee have had seven meetings, with an average attendance of seven at each meeting. With respect to a certain contract, for which tenders were invited without quantities being supplied, Federation members were advised not to tender. The contract, however, was let to a firm of non-members. It is further recorded in the report that this committee have approached the local architects soliciting their influence with respect to prompt settlement of accounts. Several favourable replies were received. The committee have under consideration the charges for water used on jobs in course of erection, and the secretary was instructed to write other towns in order to ascertain their charges for water supplied through meter or otherwise. The membership of the association showed an increase of five as compared with the preceding year.

LEIGH AND DISTRICT ASSOCIATION.

Secretary: S. Wigham.

In November, 1908, the operative painters of Leigh, Atherton, and Tyldesley gave six months' notice of their intention to demand an increase of wages of one penny per hour (from 8d. to 9d.), as and from May 1st, 1909. The masters offered them an advance of ½d. per hour as and from July 1st, 1909. The men refused the offer, and according to Rule VII., the subject had to be placed before an umpire. Both parties eventually chose Mr. W. Harrison (Mayor of Leigh) as arbitrator, who made the following award: (1) That as and from June 1st, 1909, to December 31st, 1909, the wages to be paid to the operatives shall be at the rate of eightpence halfpenny per hour; and (2) that as and from January 1st, 1910, the wages shall be at the rate of ninepence per hour.

LONGRIDGE AND DISTRICT ASSOCIATION.

Secretary: T. J. Watson.

The half-yearly general meeting of the Longridge and District Association was held on Friday evening, May 4th, Mr. Thomas Kay (president) presiding.

Various correspondence from the Lancashire, Cheshire, and North Wales Federation was read, and the general affairs of the association were considered.

Two new members were elected. Messrs. Alfred Blacklock, and Thomas Dolphin, both of Ribchester.

The annual trip (which has always been a strong feature of the social side of the association) was arranged to take place on July 15th, the place selected being Chester.

The Yorkshire Federation.

The monthly meeting of the Executive Council of the Yorkshire Federation was held at the Victoria Hotel, The Pier, Hull, on Thursday, May 20th. Councillor W. G. England, J.P. (vice-president), took the chair, and 48 delegates from affiliated associations were present.

The Chairman stated that the president, Mr. W. R. Thompson, of Dewsbury, had recovered from his illness. The Chairman referred to the death of an ex-president of the Federation, Mr. E. Good, of Hull, who had rendered yeoman service to the Federation, and had taken an earnest and active interest in its welfare, especially during the period of his office as president. The Chairman moved that an expression of deep regret and profound sympathy be conveyed to the relatives in their heavy bereavement, together with an acknowledgment of their appreciation of Mr. Good's valuable services. The resolution was passed in silence by the members standing.

On the motion of Mr. A. J. Forsdike, seconded by Councillor J. Dawson, it was resolved to tender to Mr. Day, solicitor, of Leeds, the appreciation of the Federation for his services in connection with the York case, which had been settled.

The Treasurer reported receipt of £5 3s. on account of subscriptions, and £25 6s. towards the National reserve fund. He also made an earnest request for an early payment of outstanding subscriptions, and reminded the Council that the appeal of the Federation in aid of the National reserve fund should receive loyal and generous support. On the motion of Mr. W. T. Ledgard, seconded by Mr. J. Biggin, accounts amounting to £85 19s. 3d., having been examined and recommended for payment by the Finance Committee, were approved and ordered for payment.

A report was presented showing that only 35 copies of the Federation Directory remained in hand out of the 1,000 printed. The issue had been most generously supported by a large number of associations, and would, it was estimated, yield a profit.

A letter was read from the Hull Association containing the observations of the Ocean Insurance Company on the suggested subcontract form. The Morley, Sheffield, and York Associations reported that they had considered and approved the form. The Wakefield Association suggested that the rate of interest for deferred payment to sub-contractors should be 15 per cent. per annum and not 5 per cent. On the motion of Mr. E. Quibell, seconded by Mr. A. J. Forsdike, it was resolved to request Mr. W. H. Hope, solicitor, of Sunderland, to prepare a draft form of sub-contract which incorporates the provisions of the Workmen's Compensation Act, and also includes the principles laid down in the suggested form, together with such other clauses as in his opinion are expedient and necessary.

The Leeds and Bradford Associations stated that there was considerable difficulty in making the inter-trading rule operative in their towns. The Morley and Sheffield Associations intimated their approval of the inter-trading regulations recently submitted to the local associations for observation. The Wakefield Association suggested that the words "whenever possible" should be added in two or three places. The Hull and York Associations stated they could not agree with the regulations as suggested, as they would conflict with their local rules.

ROBERT HALL,
Building Surveyor,
52, Frederick Street, BURY.

With over 35 years practical experience of the Building Trade, and during the last 15 years a very varied experience in measuring up and adjusting contract and other accounts, is prepared to undertake and submit quotations for the following :—

The Measuring-up and Adjustment of Accounts,
Collection and Settlement of Accounts,
Assistance given in Estimating,
Annual or other Periodical Stocktakings,
Private Enquiries and Arbitrations undertaken,
or any other special work incidental to that of a Builder or Contractor.

52, Frederick St., BURY.

NATURAL ROCK ASPHALTE
(Compressed or Mastic)
For Horizontal and Vertical Damp Coursing
For Flat Roofs, Basements and other floors.

The French Asphalte Co., Ltd.
(ESTABLISHED 1871)
Supply only the best material from their own mine of St. Jean de Maruejols, combined with the best workmanship.
Complete satisfaction given to the leading Architects.
Apply for Prices:—
5. Laurence Pountney Hill, Cannon Street, E.C.

D. LORDEN,
Plasterer,
Plaster and Cement Merchant,
Worker in Fibrous Plaster &c,
Tom Brown Street, RUGBY

For Architects, Builders and Engineers.
TRUE TO SCALE.
BLACK LINE PRINTS.
Permanent. *Done on any Paper or Cloth.*
R's Method of Perspective.
WRITE FOR PARTICULARS,
W. F. STANLEY & CO., LTD.,
13, Railway Approach, London Bridge.
Tel. 371 Hop. Telegrams: "TRIBRACH, LONDON.

T. N.: 14410 Central. T.A.: "Coatostone, London."
Coatostone. LIQUID STONE
NEAL'S PATENT.
Applied as Paint for Coating
Plaster, Cement, Stone or Woodwork
to produce a natural Stone effect
FOR INTERIOR OR EXTERIOR WORK
THE COATOSTONE DECORATION CO
77, Mortimer Street, Regent Street, W.

"The Practical Exemplar of Architecture."
A Portfolio of Choice Details ready for immediate use and adaptation.
Selected and Edited by
MERVYN E. MACARTNEY,
B.A., F.R.I.B.A., F.S.A.
120 Plates. Price **12/6** nett, including Portfolio.
Send for Illustrated Pamphlet.
Technical Journals, Ltd., Caxton House, Westminster.

The Finance and Emergency Committee recommended that the Federation should continue the arrangement with a syndicate of Lloyds' Underwriters for workmen's compensation insurance for another year at an increase of 10 per cent. on the present rates: the existing rates to be reverted to when the Building Operations and Engineering Works Bill becomes operative. It was stated that most of the insurance companies had experienced very heavy losses in connection with workmen's compensation risks, and it was anticipated that in many cases the premiums would be seriously increased. The endorsements on policies had been extended in their restrictions, limiting the liability of insurance companies and increasing the responsibility of employers. On the motion of Mr. A. W. Sinclair, seconded by Mr. A. J. Forsdike, it was unanimously resolved to approve of the recommendation of the Emergency Committee, and members were earnestly requested to give the scheme their serious consideration, seeing that the terms compare most favourably with those of insurance offices, while the complete indemnity given and security afforded is unsurpassed.

On the motion of Mr. A. W. Sinclair, seconded by Mr. A. J. Forsdike, it was declared that any negotiations for collective insurance which may be necessary in the future should be carried out direct with insurance companies by the secretary of the Federation, and that it be an essential condition that the Federation and local association secretaries be recognised as agents.

A letter was read from the National secretary with respect to the sending of priced schedule with tenders. It was reported that the custom obtains in Yorkshire of engineers and railway companies requiring priced schedules to be forwarded with tenders. In some cases arrangements had been made for the schedule to be sent under seal and returned in the event of the tender not being accepted. Many local authorities also ask for the same procedure to be adopted, and where it was not possible to get this waived, members were strongly advised to send in the schedules under seal, with an endorsement that the same is not to be opened in the event of its not being accepted. In most cases the local authorities return the schedule unopened, in accordance with an agreement which has been made with the local associations. This custom is not adopted in Yorkshire by architects. They only require the priced quantities to be sent in at the time when the contract has to be signed. A copy of the quantities is subsequently filled in and forwarded by the architect to the contractor. Cases have been known in which mistakes have occurred in making this copy, and some considerable difficulty has been experienced in obtaining rectification when the final account was under consideration. It was therefore suggested that the architect should forward a blank copy to the contractor when intimating acceptance of tender, in order that the contractor may fill in and deposit same with the architect.

The subject of checkweighing in the Various Industries Bill was carefully considered. While it was felt that the building trade might not be directly affected by the provisions of the Bill, attention was drawn to the growing practice of inserting clauses in Government Bills enabling a Secretary of State to bring other industries within purview of the Bill by the issue of an Order. On the motion of Mr. J. Biggin, seconded by Mr. A. Moulson, the Federation expressed the opinion that it is most inexpedient that the provisions of any Act introduced to meet the peculiar requirements of specific trades, or which were admittedly of an experimental nature, should be extended to other industries by the issue of an Order by a Secretary of State.

The question of labour exchanges and unemployment insurance was considered, and it was realised that the building trade would be particularly affected by any legislation on these matters. It was resolved, on the motion of Mr. A. W. Sinclair, seconded by Mr. J. Biggin, earnestly to request the National Administrative Committee to take steps to ensure that the interests of employers are fully safeguarded, and also to endeavour to obtain from the Government equal facilities with regard to consultation, assistance, and advice as have been or may be accorded to trades unionists.

The minutes of the Northern centre, dated April 21st, 1909; of the Northern Centre Conciliation Board, dated May 18th, 1909; and the April report of the Lancashire, Cheshire and North Wales Federation, were read and considered.

It was reported that Mr. J. T. Levitt, of Hull, had intimated that he did not desire to serve as a member of the Northern Centre Conciliation Board. On the motion of Mr. A. J. Forsdike, seconded by Mr. R. Finch, Mr. E. Quibell, of Hull, was appointed to fill the vacancy.

It was reported that several associations had not yet forwarded the comparative statements of hours and wages which were requested by May 1st. On the motion of Mr. S. Coop, seconded by Mr. A. W. Sinclair, it was resolved to remind the local associations of the value of the comparative statements, and request that the necessary information be supplied at the very earliest convenience in order that the printed abstract may be absolutely complete and up-to-date.

An invitation was read from the Barnoldswick Association for the Federation to hold the June meeting in that town. On the motion of Mr. Forsdike, seconded by Mr. Quibell, it was resolved to leave the arrangements for next meeting in the hands of the president and secretary.

The Hull Association had kindly chartered a vessel in order that the delegates might inspect the Humber. A large number accepted the invitation, and the sail was greatly appreciated, the weather being gloriously fine. The delegates were subsequently entertained to tea, and a vote of thanks was tendered to the president and members of the Hull Association for their kind arrangements and generous hospitality.—J. Davidson, 14, Park Row, Leeds.

BRADFORD ASSOCIATION.

Joint Secretaries: J. Davidson and J. H. Hopkinson.

The annual meeting of the Bradford Local Conciliation Board was held on Tuesday, May 11th. Mr. T. E. Taylor was in the chair, and all the members, with one exception, were present.

The chairman said it was a matter of congratulation that the spirit of harmony and goodwill which prevailed between the employers and operatives had been strengthened during the year, and that there had been no necessity for a meeting of the Board to deal with any matter of dispute.

The following officers were re-elected, viz.: Mr. T. E. Taylor, chairman; Mr. F. Firth, vice-chairman; and Messrs. J. Davidson and J. H. Hopkinson, joint secretaries. A vote of thanks to the chairman concluded the meeting.

HULL ASSOCIATION.

Hon. Secretary: A. Peers.

The monthly meeting of the Hull Association was held at the Builders' Exchange, on Tuesday evening, May 11th, Mr. E. Quibell presiding. Mr. E. Good, who had been an active worker in the interests of the association, and also a past president (1904) of the Yorkshire Federation, had passed away that day at "Riseholme," Sutton-on-Hull, after a very sudden and brief illness, and the members, after rising as a taken of their regret, desired that a letter expressing their deep sympathy be forwarded to the widow and family.

Correspondence was considered which had passed between the association and the operatives' societies respecting the arranged general week's holiday in August, and the matter was relegated to the management committee.

A recommendation from the management committee to admit Mr. G. H. Stonehouse, who had become a partner in the firm of Messrs. J. Jackson and Sons, into membership was accepted. Mr. F. Hall was also admitted to membership.

The criticisms of an insurance company upon the new sub-contractors' agreement issued by the Yorkshire Federation were discussed. It was decided that any further opinions and criticisms be obtained, and then discussed.

The date for the annual outing to Pateley Bridge was fixed for Thursday, June 24th, and not Wednesday, June 30th, as previously stated.

A report of the last Federation meeting was given by Mr. Quibell. The arrangements in connection with the visit of the Yorkshire Federation for their monthly meeting on June 20th, were announced as follows:—Meet at the Vittoria Hotel, Nelson Street, at 12.30 p.m., where light refreshments would be provided. Sail up the river Humber from 12.45 to 2.30 p.m., starting from the Corporation Pier. Business meeting at 2.45 p.m. at the Vittoria Hotel. Tea to be served about 4.45 p.m. In the event of unfavourable weather preventing the sail, arrangements will be made to have the visitors taken to inspect some of Hull's historic buildings.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

The monthly meeting of the Leeds Association was held on Tuestay, May 11th. In the absence of the president, Mr. O. Mawson, vice-president, occupied the chair. Apologies for absence were reported from Messrs W. Irwin and W. H. Dews.

A letter was read from a member resigning the appointments he held on various committees on account of pressure of time. All the members present, while appreciating the circumstances in which the member was placed, urged upon him to withdraw his resignation, and promised that every consideration and assistance would be extended to him by the members. The member concerned stated that he was willing to meet the wish of the members.

It was decided to appeal to the members with respect to the National reserve fund, and the amounts of subscriptions reported as received were ordered to be forwarded to the Yorkshire Federation.

The minutes of the Yorkshire Federation were read and considered.

Leeds Local Conciliation Board.

The annual meeting of the Leeds Local Conciliation Board was held on May 4th. A letter was read from the president (Mr. Wm. Irwin) regretting his inability to be present, and in his absence Mr. W. T. Newlove (vice-chairman) presided.

The officers were all re-elected, viz.:—Mr. W. Irwin, chairman; Mr. W. T. Newlove, vice-chairman; and Messrs. J. Davidson and T. Holmes, joint secretaries.

An informal discussion took place as to the desirability of an agreement or rule being mutually agreed upon by which the association or society receiving notice of alteration of rules at the last moment should be in a position, within a prescribed number of days, of giving a counter notice if considered expedient. No resolution was passed on the matter.

The recognition of notices of claims by the operatives' secretary under the Workmen's Compensation Act, and the alteration of winter working hours, were also informally discussed.

SHIPLEY AND DISTRICT ASSOCIATION.

Secretary: J. Davidson.

A general meeting of the association was held on Wednesday, May 5th. The reports of the National and Yorkshire Federations were discussed, and several points of interest were particularly considered. Arrangements were made for the annual meeting of the Local Conciliation Board. County Councillor Joseph Midgley referred to his interesting experience as a member of the recent deputation to the continent *re* town planning, housing, etc., and mentioned several particulars which had impressed him in respect to these matters.

WAKEFIELD AND DISTRICT ASSOCIATION.

Secretary: J. Beaumont.

The monthly meeting of the members of this Association was held at the Bull Hotel, Wakefield, on May 6th, Mr. Tom Lee (president) in the chair.

After the confirmation of the minutes of the last meeting, the minutes of a meeting of the Executive Council of the Yorkshire Federation, held at the Town Hall, Dewsbury, on April 15th, were read, and a supplementary report on various matters dealt with at such meeting was made by the president, and Mr. H. Fallas, who represented the Association at that meeting.

The meeting was occupied some time in considering certain suggested regulations dealing with the reciprocal relations of members of the Association and Yorkshire Federation, and the purchasing of materials from manufacturers and merchants, which regulations had been submitted by the Yorkshire Federation to the Association for consideration. It was ultimately decided to approve the regulations, subject to some slight suggested amendments thereto.

The form of contract prepared by the Yorkshire Federation to be signed by subcontractors was also dealt with, and on the motion of Mr. Crook, seconded by Councillor Spink, a resolution was passed recommending the Federation to make an alteration therein as to the amount and rate of interest to be paid by head contractors to their sub-contractors on moneys due to the latter under the contract, and retained in hand by the former beyond the specified time.

Wakefield and District Building Trades Conciliation Board.

The annual meeting of Wakefield and District Board was held at the Bull Hotel, Wakefield, on May 13th.

At the commencement of the meeting Ald. Judge, the retiring chairman, took the chair, and proposed the election of Mr. J. Pashley as chairman for the ensuing year. The proposition was seconded by Mr. H. Green, and Mr. Pashley was unanimously elected. On the proposition of Mr. J. Bagnall, seconded by Alderman Judge, Mr. H. Green was elected vice-chairman. The hon. secretaries were re-elected on the motion of Alderman Judge, seconded by Mr. H. Slade.

After the election of officers, a discussion took place on several matters affecting the building trade, and on the objects of the Conciliation Board.

YORK ASSOCIATION.

Secretary: J. Hague, Solicitor.

An executive meeting of the York Association was held at the Old George Hotel, Pavement, on Thursday, May 6th, at 8 p.m. Mr. W. E. Biscomb presided. The minutes of last meeting having been read and confirmed, the chairman referred to the loss sustained by the association since the last meeting in the death of Mr. H E. Turner, a past president and most valued member. He moved that a letter expressive of the association's sympathy be sent to the widow and family of deceased. Mr. C. Dent endorsed the chairman's remarks, and the resolution was carried by the members standing.

The Yorkshire Federation's suggestions as to interpretation of inter-trading by those associations who have adopted the rule were considered in detail. Suggestions 1 and 2 were unanimously rejected and disapproved of so far as York was concerned. The interpretation was unsuitable for the working of the local association, and its adoption would mar the effectiveness of the rule and hinder the progress of the association.

The last suggestion was considered unnecessary, having regard to the preceding ones, but (although unnecessary) the principle was disapproved of by the members. There was no objection to the other suggested interpretations of rule.

The proposed form was considered by the members, and approved, and reference was made to the clause relating to insurance against third-party risks, which was a risk increasingly necessary to be provided for. Correspondence was read and rates compared with reference to this risk, and finally a scheme was recommended to be placed before the members at the next general meeting. The secretary was asked to obtain as much information as possible, so as to impress upon members the gravity of the risk and the necessity for adequate provision being made against it.

It was unanimously resolved to purchase copies of the Federation Directory, at the special preferential rate, and present them free of charge to members.

The secretary reported that the pageant committee had agreed to allow applications for special workmen's tickets to view the three dress rehearsal performances, to be sent collectively through him, and he had accordingly notified all members of the fact. The secretary's action was approved, and the hope was expressed that arrangements would be made to allow of the workmen attending these special shows.

The question of the proposed annual excursion was adjourned for further consideration and report to the next executive meeting.

Messrs. H. Braithwaite and Co., Ltd., were elected members of the association.

A letter was read from the local secretary of operative bricklayers enclosing draft of new rules and asking for masters' interpretation of a clause relating to walking time in one of the existing rules. The secretary was asked to reply giving the association's ruling.

The following were unanimously elected to sit on the local Conciliation Board for the coming year: Councillor Sharp (chairman), Councillor Mansfield, J.P., and Messrs. W. Bellerby, W. E. Biscomb, H. Colman, and R. Dent.

Northern Counties Federation.

SOUTH SHIELDS.

Secretary: J. G. Robertson.

A special meeting of the South Shields Association was held in the Victoria Hall on Thursday, May 6th, the president, Councillor J. T. Armstrong, presiding.

The Chairman explained that the meeting had been called as the result of the action of the Sunderland and South Shields Water Company in refusing to connect the water to a member's new houses when requested to do so. He then called upon the secretary to read the correspondence that had passed between the water company and the Association on the subject. To the question as to why they had refused to connect the water in the case referred to, the water company's reply was that it was because the water pipes had not been inspected by one of their inspectors previous to their having been covered up. The water company, having been asked for a explicit statement of their requirements, replied that, pending the issue of their new regulations, they had given their inspectors the following instructions:—I.—That all service pipes should be laid at a minimum depth of 2ft., and inspected before being covered up. II.—That in all new buildings all lead joints shall be proper wiped plumbing joints. III.—That, whereever possible, taps should be placed inside; or, if not practicable to put tap inside, to be efficiently protected against frost or other injury.

After a long general discussion on the above, it was eventually agreed to fall in with the water company's suggestion, and to meet the water company's chief inspector in order to discuss the matter, and Messrs. J. T. Armstrong, A. Ross, W. Brown, and the secretary, were appointed to meet him for that purpose.

It was unanimously agreed to write the Member for the borough, Sir W. S. Robson, K.C., M.P., Attorney-General, protesting most strongly against the Budget proposal of an additional 10s. per cent. stamp duty on property transfer, and to ask him to use his influence in trying to get it removed; the Association believing the addition will seriously affect the building trade, and will stop for some time any hope of selling property. The members also intend to ask the Tyne and Blyth Federation to join in this protest.

THE ASTON JUNCTION CO.
LTD.,
Aston Road, BIRMINGHAM,
BUILDERS' MERCHANTS
AND
SLATING CONTRACTORS.
CEMENTS, PLASTER, LATHS, LIME, QUARRIES, TILES, CHIMNEY POTS, SANITARY GOODS, FIRE BRICKS, and BLUE BRICKS of every description.
TELEGRAMS—"CONCRETE, BIRMINGHAM."
TELEPHONE NO.—1436, CENTRAL.

RUDDERS & PAYNES,
LIMITED.
TIMBER AND SLATE MERCHANTS,
SLATING, TILING AND
FENCING CONTRACTORS.
SAWMILLS.
Every requisite for the Building Trade.
CHESTER ST. and HUBERT ST.,
ASTON RD., BIRMINGHAM.
Telegrams:—Sawmills, Birmingham.
Telephones:—2529, 807, & 4333 Central.

HOLLIS BROTHERS
& CO.,
Timber Importers.
HULL. Jameson Chambers.
LEICESTER. Queen Street.
Wood Block Flooring.
H. B. Hardwood,
Floorings,
Oak, Maple, etc.
Large Stocks of Joinery Wood held under cover.
Mouldings, etc., to design.
Telephone: No. 82 CENTRAL (2 Lines).
Telegrams: "ELF, BIRMINGHAM."

SUTTON & ASH,
41, SNOW HILL, BIRMINGHAM.
JOISTS, CHANNELS,
ANGLES, TEES,
RIVETTED GIRDERS,
LIGHT ROOFS, &c.

"The Architectural Review."
A Magazine of Architecture and Arts of Design. Edited by MERVYN E. MACARTNEY, B.A., F.R.I.B.A., F.S.A.
Price 1/- Monthly. Annual Subscription 16/- post free.
Technical Journals, Ltd., Caxton House, Westminster.

It was agreed that in future the monthly meeting should be held on the first Tuesday of every month.

As the result of a long discussion on the question of accident insurance, it was resolved to invite Mr. Creasor, of the Federated Builders' Insurance Co., to attend the next meeting in order to put his company's proposals before the Association.

It was resolved to write the glass merchants in the town with reference to their terms.

The chairman and secretary referred to the "Builders' Journal," and urged members who were not already subscribers to become so. Several members present spoke to the great value of the journal, the amount of information it contained, and as to its great usefulness to all engaged in the building trade and the benefit they had personally derived from reading it.

STOCKTON-ON-TEES ASSOCIATION.

Secretary: W. C. Creasor.

At a meeting of Stockton-on-Tees and District Association held on May 4th, Mr. T. Brown, in the absence of the president, presided over a good attendance of members.

Mr. J. Routledge, lime merchant, of Ferryhill, was accepted as an honorary member.

The Secretary reported that he had approached the Master Painters' Association on the question of affiliation with this association, and was still awaiting a reply. The secretary's action was approved.

A long discussion took place on the amended form of sub-contract, submitted by the Teesside Association Executive, and it was decided to recommend the formal adoption of this agreement; but at the present time it was not to be made compulsory on all members to use it.

Owing to increased membership, an extra representative was required, on both Teesside and Federation Committees, and it was unanimously decided to elect Mr. Wintersgill, slater, for the former committee, and Alderman T. B. Watson, plumber, for the latter committee.

It was decided to support the suggestion that the Teesside executive should arrange for a summer outing.

It was also decided to support the suggestions for a uniform starting time for all trades in all the towns covered by the Teesside and District Association, and for an apprenticeship indenture form for the same district.

A report of the Northern Counties Federation meeting was presented by the secretary, and discussion ensued thereon, principally in relation to the national form of contract.

TEES-SIDE AND DISTRICT ASSOCIATION.

Secretary: W. C. Creasor.

At a meeting of Teesside and District Association Executive Committee, held on May 6th at Stockton, Mr. J. Proud (president), of West Hartlepool, presided over nearly a full complement of the committee.

The chief interest centred in the question of the form of sub-contract drawn up by this committee, and reports were received from the local associations. After a lengthy discussion, it was decided formally to adopt the agreement (which is printed in another portion of the present issue), but not to make its use compulsory at present, and the secretary was ordered to have 500 copies printed at once.

On the question of apprenticeship indenture forms, it was reported that further supplies of the National form could not now be obtained from the National Federation, and it was decided that we adopt this form as a Teesside form, and that copies be printed at once; a scale of wages for apprentices in the different trades to be also compiled.

Reports were received from the local association on the question of uniform working hours for the district for all trades, and it was thought that it would be well to ask the operatives to send representatives to an informal conference to discuss this question, the secretary to arrange date and other details.

The Secretary reported that the annual meeting of Conciliation Boards was due to be held in May, and it was decided to make no change in the representation on our side.

It was decided to have a summer outing, the secretary to confer with the local secretaries and submit details at next meeting.

Midland Centre.

The fourth annual meeting of the Midland Centre Conciliation Board was held at Leicester, on May 18th, under the chairmanship of Mr. John B. Whitehouse (Birmingham).

The secretaries' annual report stated that the past year had not been quite so free from disputes in the Midland Centre area as the previous 12 months. The difficulties, however, which had arisen had not been of a very serious nature, and their settlement had proved conclusively the value of the various Conciliation Boards. The Midland Centre Board had had to deal with 3 disputes, one of which (the first since the inauguration of the Board) it had been unable to settle. Difficulties had been settled locally at Birmingham, Leicester, and Newark. Three new local Boards had been formed since last annual meeting—at Stourbridge, Redditch, and Bromsgrove. The report was approved.

The joint secretaries were instructed to take steps with a view to the formation of other local Conciliation Boards in the Midland Centre area.

A resolution was passed recommending the National Board to admit the Builders' Labourers to the full benefits of the Conciliation Board scheme. The proposals of the Northern Centre for amending the National Conciliation Board rules were considered, and the National Board were recommended to approve the suggested addition to rule 2, and (with slight verbal alteration) the two proposed new rules. The National Board were recommended not to alter rule 13 (decisions and voting).

Mr. F. Camm (Amalgamated Society of Carpenters and Joiners, Nottingham), who has been vice-chairman of the Board for the past 12 months, was appointed chairman for the ensuing year. A hearty vote of thanks was accorded Mr. J. B. Whitehouse (Birmingham) for his valuable services as chairman of the Board since its inauguration in March, 1906. Mr. Fred. H. Fish (Nottingham) was appointed vice-chairman, and Messrs. F. W. Amphlet and J. Blount (Derby) were re-appointed employers' and operatives' secretaries respectively.

It was decided to hold the next annual meeting of the Board in Worcester. An appeal from the West Bromwich Local Conciliation Board was then considered. The employers had given notice of alteration of working hours so that the time for starting in summer should be 6.30 a.m. instead of 6 a.m. The carpenters and joiners had refused to accept the alteration unless an advance of ½d. per hour in wages were made. Councillor H. Smith, who represented the employers, stated that the West Bromwich Master Builders wished to secure uniformity of working hours in all branches, and that the bricklayers, masons, and labourers had accepted the alteration. In view of the lower rate of wages in adjoining towns and the depression in trade, the time was inopportune for an increase in wages.

Messrs. J. Thursfield, J.P., D. Parkes, and W. Neale represented the operatives, and stated that they wished to secure uniform wages as the employers wished to secure uniform hours of work. The carpenters had for some time desired to be placed on the same level as the bricklayers, but (owing to the state of trade) had refrained from asking for an advance. They would not have done so now, if the employers had not given notice as to the hours of work. The Board decided, by the cross vote, that the working hours of the carpenters and joiners of West Bromwich should be the same as those arranged with the bricklayers, stonemasons, and labourers, and that the rate of wages per hour should remain as at present.

In view of the proposals of the Northern Centre to alter No. 13 of the general rules,

LONDON
JAMES BROWN (LONDON), LTD.,
MAKE THE BEST
HOLLOW POROUS BRICK PARTITIONS
In 1½ in., 2¼ in., 3 in. and 4 in. thicknesses.
Takes a Nail Perfectly.
ESSEX WHARF, WHITECHAPEL, E.
—— Telephone, 9513 Central. ——

Telephone, No. 1062 HOLBORN.
Contractors to H.M. Government, &c.
THE PERFECT TILE CO.,
13 & 15, Featherstone Buildings,
Holborn, LONDON, W.C.
OPAL WALL TILES. GLAZED WALL TILES
Tessellated and other Floor Tiles.
Terrazzo and Cube Mosaics to any Design.
Fireproof Partitions. Fireproof Jointless Floors
AGENT FOR "MODERNIA" GLASS TILES

BUILDING . BOOKS . AT
GREAT REDUCTIONS ! !
New Books at 25 per cent. Discount.
Books on Building, Architecture, Surveying, Estimating, Technical, all other Subjects and for all Examinations Supplied. Sent on Approval.. State Wants. Catalogues Free.
BOOKS PURCHASED.
R. P. FOYLE, 135, Charing Cross Road, London, W.C.

Send for Prices and Particulars of
FRAZZI FIREPROOF
FLOORS & PARTITIONS.
Frazzi Fireproof Construction, Ltd.,
Essex Wharf, Durward Street,
WHITECHAPEL.

BIRKBECK BANK.
ESTABLISHED 1851.
SOUTHAMPTON BUILDINGS, HIGH HOLBORN, W.C.
2½ PER CENT. INTEREST.
allowed on Deposit Accounts.
2 PER CENT. INTEREST
on Drawing Accounts with Cheque Book.
All general Banking Business transacted.
ALMANACK with full particulars, POST FREE
C. F. RAVENSCROFT, Secretary.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs,
Premier Ironworks,
DEPTFORD, S.E.

ELEVATORS.
SPRAGUE ELEVATOR CO. LTD.,
QUEEN ANNE'S CHAMBERS,
WESTMINSTER,
LONDON, S.W.

it is interesting to note that this is the second dispute decided by the Midland Centre Board within the past two months, by a majority of one cross vote, and in both cases the verdict was in favour of the employers.—Fred. W. Amphlet, Employers' Secretary, 58, New Street, Birmingham.

South-Eastern Centre.

SOUTHAMPTON AND DISTRICT ASSOCIATION.

Hon. Secretary: A. T. Doggrell.

The annual meeting of the Southampton Association was held at the Royal Hotel, April 29th, when there were a large number of members present.

Notices having been received from the operatives of all trades asking for an increase of wages of 1d. per hour and sundry alterations of rules, it was agreed to appoint a date to receive deputations from the various trades, in order to point out to them the impossibility of increasing wages while trade remained in such a depressed state. The balance sheet for 1908 having been received and adopted, the election of officers resulted in the following being appointed:—President, Mr. J. P. Beer; vice-president, Mr. W. R. Franklin; hon. treasurer, Mr. J. T. Othen; hon. secretary, Mr. A. T. Doggrell; assistant secretary, Mr. S. J. Moore; hon. auditor, Mr. J. Franklin; committee, Messrs. Cawte, Grace, Hampton, Dyer, Jordan, Marshall, Stevens, Cook, Rashley, Franklin (G.), Lewis, Jupe, and Kimber (S.); Conciliation Board, Messrs. Cawte, Stevens, Beer, Marshall, Dyer, Franklin, and Doggrell (hon. secretary). Other business dealt with by the meeting included the election of a new member, and a proposal to write the town clerk pointing out that the National Form of Contract is in general use amongst local architects and has recently been adopted by the Board of Guardians, and asking if his Council could see their way clear to adopt same—this was carried unanimously.

A vote of thanks to the chairman closed the meeting.

NORWICH BUILDING TRADES CONCILIATION BOARD.

Secretary: G. E. Whitrod.

The third annual meeting of this Board was held on Friday evening, April 30th, at Victoria Chambers, Bank Plain, Norwich, the chairman (Mr. G. Brown) presiding. The business was entirely of a formal character, and consisted of the election of representatives for the current year. The new representatives are as under:—Employers: masons, Messrs. G. A. Hawes and John Young; bricklayers, Messrs. B. E. Scarles and Frank Hurn; carpenters, Messrs. W. T. Scarles and W. S. Daws; plumbers, Messrs. W. E. Bird and R. A. Pank. Operatives: Bricklayers, Messrs. G. Brown and G. F. Hifferson; masons, Messrs. E. Green and F. Buttress; carpenters, Messrs. J. Newman and G. E. Beckwith; plumbers, Messrs. C. Lake and A. Pigg. The chairman appointed was Mr. B. E. Scarles; vice-chairman, Mr. F. Buttress. Votes of thanks were accorded to the retiring chairman and vice-chairman (Mr. J. S. Smith), for their services during the year.

Westminster City Council has received a communication from the superintending architect of the London County Council, enclosing a copy of a letter from Lord Curzon with reference to the proposal to re-name Charles Street, Whitehall. Lord Curzon points out that a sum of more than £5,000 has been contributed for the erection of a bronze statue of Robert Lord Clive, the founder of the British Dominion in India; that a site has been selected on the top of the proposed flight of steps at the St. James's Park end of Charles Street; and that the statue will therefore stand close to the India Office. It has been suggested that Milton Street would be a suitable name, but Lord Curzon points out that it would be strangely incongruous to arrive at Clive's statue by walking down Milton Street. The London County Council suggests that Charles Street shall be re-named "Clive Gate."

A POINT IN TOWN PLANNING.

By G. Cadogan Rothery.

By no means the least valuable addition to the Housing and Town-Planning Bill as re-introduced into the House of Commons by Mr. Burns, is the new clause by which local authorities are compelled to prepare registers of housing accommodation within their areas, and to revise them every five years. If other provisions of the Bill are to become effective, this clause is indispensable, as it alone affords the machinery for gauging the actual needs of any locality. There is a tendency to criticise this innovation, on the ground that it would present many difficulties and entail heavy expenses. That this need not be the case in either respect in shown by what has been done in Paris on these lines, and that, too, on a more elaborate scale than is here proposed, and with other and far wider reaching aims in view. It is well worth while going into particulars, as we may draw some useful lessons therefrom.

It was as far back as January, 1894, that the Casier Sanitaire—or what we may call the House Sanitary Census—was inaugurated in two moderate rooms of an annexe to the Hotel de Ville. The work was entrusted to an official of the Prefecture of the Seine, M. Juillerat, Chief of the Bureau of House Sanitation. The aims kept in view were to assist the sanitary inspectors in their duties, and, mainly, to provide reliable statistics required as a basis for the study of certain important health problems. Very simple preparations were made. The inner of the two rooms referred to is sixteen feet square and thirteen feet high, and is completely lined with shelves divided up into pigeon-holes of varying widths. Each pigeon-hole contains a cardboard box, labelled with the name of a street, bearing the arrondissement number, and certain index figures affixed by rubber stamps. The boxes are classed by arrondissements (corresponding to our Metropolitan boroughs), and arranged alphabetically in each division. Inside the box is a plan of the street, showing its fringe of houses. Accompanying this is a ruled sheet of paper with printed headings, whereon are entered particulars as to length and width of street, nature of paving, sewerage and drainage, and water mains, and all other necessary information of this character. The boxes also contain cartridge paper wrappers or folders, marked with the number of individual houses, as well as name of street, and arrondissement numeral. There is a folder for every house in the street, square, or yard. On the inside of the cover there is a small tinted plan, showing area occupied by house and court yard, a section showing number of floors and indications as to drainage and water supply. Within the folder are a collection of differently coloured sheets of ruled paper, with printed headings. The first, white, gives a complete description of the structure and planning; floor by floor are indicated the number of rooms, their dimensions, sanitary accommodation, and number of inhabitants. A second sheet, printed on green paper, is reserved for records of deaths and occurrences of notifiable and certain other diseases (at the present moment: typhoid, measles, scarlatina, diphtheria, smallpox, whooping cough, cholera, tuberculosis, erysipelas, and puerperal fever). Then follows a yellow sheet, kept for records of any disinfecting operations carried out on the premises. On a brown sheet are tabulated reports furnished by sanitary inspectors, after visits following upon complaints received. Any orders made regarding cleansing or structural repairs and alterations are entered on a final sheet, which is also provided with ruled spaces for recording particulars as to legal proceedings, and reference numbers to files relating to the special case. If a house is pulled down, the folder and its contents are not destroyed; the cover is merely stamped with the word "Demolished." When a new house has been erected on the site, a fresh folder and record is prepared, the old one being included within the new folder for purposes of comparison. This practice has been found most useful by the health authorities and the social economy officers.

It will be seen that by adopting the above method the Paris Municipality is now in possession not only of an exhaustive register of dwellings, but a record of their hygienic history, with other data invaluable for the statistical officers. Already it has been possible to draw deductions, to note how certain diseases are localised, and to judge whether such localisation is due to natural conditions or to the structures themselves, or their grouping. Consequently the work done is gradually becoming widely appreciated, not only by officials, but by the public. Our own municipal authorities at home possess records of much of the information referred to above, but it is not collected or classified on any methodical plan analogous to that existing in Paris.

At the first blush the amount of labour involved seems stupendous, but as a matter of fact, as explained to me by M. Juillerat some few years ago when I visited his department, it did not involve the employment of a big staff. Begun in January, 1894, the work was brought to a successful conclusion in 1900. Yet, the Municipality possessed no special powers conferred either by legislation or ministerial decree. It was all accomplished by quiet, unostentatious extension of office routine work. For the preliminary stages (which occupied three months) the rating register was utilised, the labelling of street boxes and the house folders being prepared therefrom. But all else was blank, for this register is only a somewhat incomplete directory. All details had to be collected on the spot, district by district, although folders were also filled sporadically as the daily operations of the sanitary or building departments went on. Meanwhile every record is kept well up to date. It is somewhat remarkable that M. Juillerat, who has his other routine duties to attend to, has only two assistants for the indoor work of this Casier Sanitaire. Then as regards the outside work, even this entails little additional expense, for it is carried on not by a special staff, but by the existing officials, sanitary inspectors and disinfecting officers, whose reports are made use of as the basis for the records.

Certainly what has been done by the hard-worked officials of the Paris Municipality could well be done over here. In Paris there were no special legal facilities to smooth the way: here our local authorities will possess all the impelling force conferred by a definite clause in an Act, which should prove an immense help in the matter of saving time and also of securing thoroughness. As regards the financial side of the question, there is nothing to alarm the severest economist in the very moderate clause inserted in the Housing and Town-Planning Bill. Such registers should be easily and quickly prepared, even in populous cities, and should, eventually, form, with the co-operation of the Medical Officers' departments, a basis for a complete sanitary census on some such lines as briefly described above.

Coming Events.

Saturday, June 5.

Edinburgh Architectural Association, 117, George Street.—Visit to Glasgow.

Monday, June 7.

Royal Institute of British Architects, 9, Conduit Street, Hanover Square, W.—General Meeting (Business), 8 p.m.

Society of Engineers, Royal United Service Institution, Whitehall.—Ordinary Meeting.

Thursday, June 10.

Paint and Varnish Society, St. Bride's Institute, E.C.—Mr. M. B. Blackler, Ph.D., on "The Use and Abuse of Driers."

Thursday, June 10—Saturday, June 12.

Association of Water Engineers, 54, Parliament Street, Westminster.—Fourteenth Annual General Meeting, Durham.

DOLOMENT
Jointless Flooring
And Wall-Covering Material

For High Class Buildings
Guaranteed not to bulge or crack
Fireproof
Impervious
Hygienic
Resilient
Durable
Write for Catalogue and Sample

THE BRITISH DOLOMENT Co. LTD.
1 Caxton House Westminster S.W.

Farrer's Automatic Sewage Distributor

ENSURES THE BEST EFFLUENT.

HUNDREDS IN USE.

WILLIAM E. FARRER,
Star Works, Cambridge Street,
BIRMINGHAM.
Also
LONDON, CARDIFF, LEEDS.

The Renowned
Andrews-Hawksley
Patent Tread

Applied to Wood, Iron, Stone or Concrete Stairways, Floors, Landings, Platforms, Non-Conducting Floor Plates for Electric Light and Power Stations, Pavement Covers, etc., etc.

Pioneers of all Stair Treads.
The Tread that has lasted a lifetime.
There is nothing to equal it in the Market.

Architects and Engineers are invited to inspect our New Iron Staircase and Stair Tread made and laid by us at St. James's Park Station (District Railway).

Quotations given for Concrete Steps fitted complete with our Treads.

Quotations given for Concrete Steps fitted complete with our Treads.

Used by Great Western Railway, London and North Western Railway, London, Brighton and South Coast Railway, Great Northern Railway, Midland Railway, North Eastern Railway, North British Railway, Lancashire and Yorkshire Railway, H.M. Office of Works, War Office, Admiralty, etc.

Specialists in Light Constructional Work in Iron or Steel; Special Work in Wrought or Cast Iron; Staircases of every description; Concrete and Granolithic Work, etc.

Fire Escape Staircases with our Treads, a Speciality.

THE ANDREWS-HAWKSLEY PATENT
TREAD & ENGINEERING COMPANY,
Columbia Works, Prestons Road,
POPLAR, LONDON, E.

Telephone No. 700 Eastern.
Telegrams: "Uniflorous, London."

Publisher's Notices.

Offices: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address: "Buildable, London."

Telephones: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application.

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

*This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER, S.W

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Axminster.—For the erection of four cottages, at Axminster, for the Axminster Development Syndicate, Ltd. Symes and Madge, architects and surveyors, Chard and Axminster. Quantities by the architects:—

	£	s.	d.
T. Munford, Crewkerne	£1020	16	9
R. G. Spiller, Chard	978	0	0
Pittard and Son, Langport ...	825	0	0
J. Clarke, Axminster	765	15	0
Parsons Bros. and Dunster, Chard	750	0	0
J. Layzell, Broadway	721	10	0
J. Bazley, Axminster	695	0	0
Newbery and Son,* Axminster...	672	10	0

Bromley, Kent.—For erection of stables, etc., Church road, Bromley, Kent, for Mr. S. C. Covell. Mr. W. Pamphilon, architect, 21, Finsbury Pavement, E.C.:—

Graty	£1,137
Pearce Bros.	1,125
Hill and Gurr	1,107
Arnaud and Son	1,095
Crossley and Son	1,057
Deadman	1,015
Duthoit	957

Bushey, Herts.—For the construction and erection of alterations and additions to the Hall Road pumping station, for the Bushey Urban District Council. Mr. E. E. Ryder, Bushey, engineer:—

	£	s.	d.
Bailey and Sons,* Bushey			
F. P. Bliss, Bushey	£2,550	12	6
Cunliffe and Sons, Ltd., Birmingham	2,303	18	9
G. Jagard, Bushey	2,200	0	0
W. and D. Wilkins, Watford ...	2,159	0	0
Heath	£2,098	0	0

***Accepted.**

Cheltenham.—For the extension of the Shire Hall, Cheltenham. Plans prepared by Mr. Robert Phillips, A.M.I.C.E., county consulting engineer:—

H. Ash, Devizes	£17,270
Subey and Sons, London	16,993
Willcocks and Co., Wolverhampton	16,975
Stephens and Bastow, Bristol ...	16,878
Sapcote and Son, Birmingham ...	16,877
Collins and Godfrey, Tewkesbury ...	16,788
Bloxham and Co., Banbury	16,313
Lovatt, Wolverhampton	16,272
Cowlin and Son, Bristol	16,181
Rowse, London	16,140
Nicholson and Sons, Leeds	16,000
Walters and Sons, Bristol	15,987
Bayard and Son, Gloucester ...	15,885
Estcourt and Son, Gloucester ...	15,838
Jones and Son, Gloucester	15,770
Bovey and Son, Torquay	15,692
Coles, Plymouth	15,541
Colborne, Swindon	15,394
Bowers and Co., Hereford	14,982
Long and Sons, Bath	14,980
Nicholls and Son, Gloucester ...	14,949
Pethick and Son, Plymouth	14,444
Crane, Ltd.,* Nottingham	13,857

*Accepted.

Le Touquet, Pas-de-Calais.—Accepted for English church at Le Touquet. Mr. A. Blomfield Jackson, architect, 3, New Square, Lincoln's Inn, W.C.:—W. Jones and Sons, Westminster, £1,076.

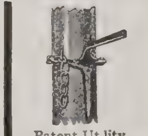
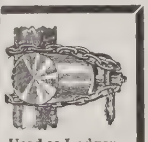
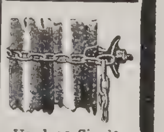
London.—For erection of new schools, Lauriston Road, Hackney, for the London County Council:—

	£	s.	d.
C. R. Price, 139, Bishopsgate Street Without	£9,009	0	0
McLaughlin and Harvey, Ltd., 13, Brecknock Road	8,816	15	10
W. Johnson and Co., Ltd., Wandsworth Common... ...	8,814	0	0
W. Harris, North Woolwich ...	8,708	0	0
W. M. Dabbs and Son, Stamford Hill	8,649	0	0
McCormick and Sons, Northampton Street, Essex Road...	8,587	0	0
Perry and Co. (Bow), Ltd., Tredegar Works, Bow	8,485	0	0
C. P. Roberts and Co., Highbury	8,471	0	0
T. D. Leng, Deptford	8,372	0	0
F. and T. Thorne, Isle of Dogs	8,366	0	0
E. Lawrence and Sons, Wharf Road, City Road	8,287	0	0
W. Shurmur and Sons, Ltd., Upper Clapton	8,217	0	0
Galbraith Bros., Ltd.,* 46, Camberwell Green	8,140	16	0

Architect's (Education) estimate, £8,620

*Recommended for acceptance.

(*Tenders continued on page viii.*)

"SCAFFIXER" Block.
Patent Utility Scaffolding Bracket.
Used as Ledger and Standard Tie.
Used as Single or Band Ties.

REVOLUTIONISES SCAFFOLD FIXING.
Supersedes the Scaffold Cord and Wedge. Practically Indestructible. Never slackens nor slips.
Immense Saving in Time and Labour.
D. P. JONES' Patent Rapid
SCAFFOLDING BLOCK
And Utility Bracket.
FIXED IN ONE MINUTE. RELEASED INSTANTLY.
Write for particulars and photographs to THE
Patent Rapid Scaffold Tie Co., Limited,
124, Victoria St., Westminster, S.W.
Contractors for the Supply, Hire, or Erection of Scaffolding.
Tel. 6030 Wstmnstr. Teleg. "Scaffixer, London."

Telegrams—"Hoptonwood, Wirksworth."
Telephone—No. 9 Wirksworth.
THE HOPTON-WOOD STONE FIRMS, Ltd.
QUARRY OWNERS and WORKERS of WHITE, GREY and DARK HOPTON-WOOD STONE, BIRD'S EYE, BLACK and FOSSIL MARBLES.
Wirksworth, DERBYSHIRE.
London Agency Office: 134, CHEAPSIDE.
Telegrams—"Guttridge, London." Telephone—2759 Central.

THE BUILDERS' JOURNAL BOOK LIST.
Being a comprehensive Catalogue of the most recent and authoritative text-books on various subjects connected with Architecture and the allied Arts of Design, Building Construction, and Engineering, together with their published prices, 1908.
Price 3d. Post Free, 3½d.
Technical Journals, Ltd., Caxton House, Westminster, London.

JAMES CHEW & Co.,
Brookhouse Brass and Copper Works, BLACKBURN.
Copper Cylinders and Boilers and Pans of very description.
Sanitary Brass work.
Copper Cylinders for any pressure.
Copper Boilers for every class of Range
Galvanised Cisterns.
Roofs and Turrets covered with Copper.

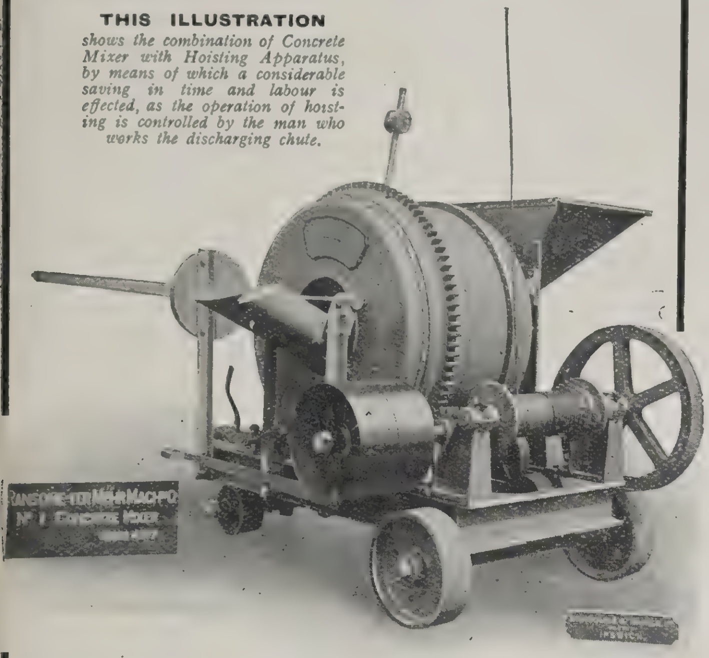
RANSOME

CONCRETE MIXER

(Manufactured by Ransomes and Rapier, Ltd.)

SIMPLE. EFFICIENT. RAPID.

THIS ILLUSTRATION
shows the combination of Concrete Mixer with Hoisting Apparatus, by means of which a considerable saving in time and labour is effected, as the operation of hoisting is controlled by the man who works the discharging chute.



GREAT SAVING IN LABOUR, MATERIALS, POWER & MAINTENANCE.

ILLUSTRATED BOOKLET ON APPLICATION.

RANSOME-VERMEHR MACHINERY Co.
507, Caxton House, Westminster, S.W.

STACEY'S
PATENT
WINCHES.

TIME AND LABOUR SAVED.

Builders, Contractors, Fireproof Building Constructors, etc., can effect a saving of 50 per cent. in labour by the use of these Winches.

In use and used on

Royal Mail Offices, Kingston, Jamaica.

New Mills, Elland, Yorkshire.

New Works, Entent, Singapore.

Salvation Army Shelter, Blackfriars Road, London, S.E.

Prospect Works, Sheaf Street, Leeds.

New Schools, Raynes Park, Surrey.

New Schools, Llandudno.

Western Valley Sewers, Newport, Mon.

And numerous other buildings in London and the Provinces.

WITH BRAKE. WORKED BY ONE MAN.

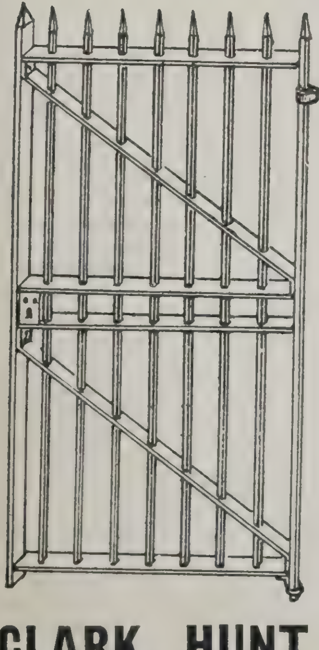
Can be worked in any position. A large number in use. Always in Stock.

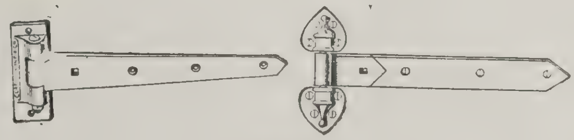
Send for Illustrated Circular.

G. STACEY & CO.,
66, Lorrimore Rd., WALWORTH, LONDON S.E.

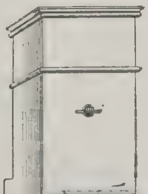
IRONWORK FOR COUNCIL SCHOOLS

GENERAL BUILDERS' IRONWORK.

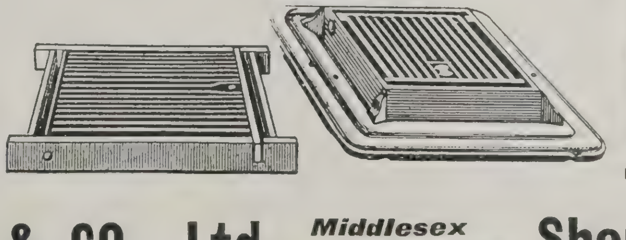


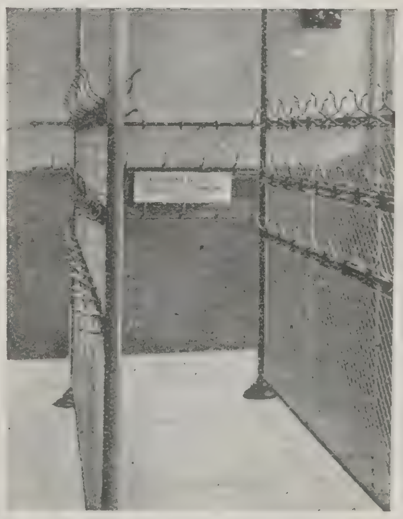


GATES . . and . . . RAILINGS.



TOBIN TUBES and GULLY GRATES





PATENT HAT AND COAT RAILS.

CLARK, HUNT & CO., Ltd., *Middlesex Ironworks,* **Shoreditch, London.**

GENERAL CATALOGUE ON APPLICATION.

enders continued from page vi.)

London, N.E.—For new municipal buildings, for Bethnal Green Borough Council. Mr. E. E. Finch, borough engineer and surveyor:—

C. Wall, Ltd.	£29,700	0	9
J. Appleby and Sons	29,225	0	0
W. Nicholson and Son (Leeds), Ltd.	28,571	13	11
Spencer, Santo and Co., Ltd.	27,412	0	0
G. Parker and Sons	27,174	0	0
B. E. Nightingale	27,078	0	0
McCormick and Sons	26,942	0	0
Todd and Newman	26,900	0	0
Higgs and Hill, Ltd.	26,460	0	0
H. L. Holloway	26,387	0	0
Stapleton and Sons	26,350	0	0
J. and M. Patrick	26,273	0	0
J. S. Hammond and Son	26,257	0	0
Pasterfield and English	26,238	0	0
W. Shurmur and Sons, Ltd.	26,151	0	0
Perry and Co. (Bow), Ltd.	25,980	0	0
Hammond and Miles	25,831	1	0
A. Monk	25,827	0	0
A. N. Coles	25,808	0	0
J. Allen and Sons, Ltd.	25,784	0	0
F. and G. Foster	25,596	0	0
H. J. Williams, Ltd.	25,527	0	0
W. J. Maddison	25,449	0	0
Armitage and Hodgson	25,388	0	0
W. Lawrence and Son	25,278	0	0
C. F. Kearley	25,203	0	0
J. W. Jerram	25,197	0	0
W. Pattinson and Son, Ltd.	24,991	0	0
R. A. Lowe and Co.	24,900	0	0
F. G. Minter	24,490	0	0
Brand Pettitt and Co.,* Tottenham	24,450	0	0
W. J. Fryer and Co.	23,407	3	9

*Accepted.

Monmouth.—For erection of a new vicarage at Tregare, for the Rev. Wm. Evans. Mr. E. G. Davies, M.S.A., architect, Hereford and Monmouth:—

R. W. Moon, Newport	£1,650
J. Jenkins, Ltd., Newport	1,300
H. Smith, Kidderminster	1,287
W. Powell, Hereford	1,153
Hall and Harding,* Monmouth	1,121
W. C. Bolt, Hereford	1,100

*Accepted.

Maldon, Essex.—For the erection of a pair of villas, Fambridge Road, Maldon, for Miss H. J. Sadd. J. Russell Rogers, P.A.S.I., architect, Maldon:—

John Rayner, East Hanningfield	£1,262	15	0
Joseph Smith and Son, Witham	1,055	0	0
Alfred Ward and Son, Great Totham	1,055	0	0
Geo. Grimwood and Sons,* Sudbury	998	0	0

*Accepted.

Plymouth.—For additions and alterations to the Grammar School, North Road, for the Education Authority. Messrs. Hine, Odgers and May, architects, 23, Lockyer Street, Plymouth:—

J. Cockerell	£1,538	0	0
A. Andrews	1,390	0	0
H. J. Allen	1,322	4	8
J. Paynter	1,295	0	0
Wakeham Bros.	1,217	0	0
Pearn Bros.	1,195	0	0
D. Carwithen	1,147	0	0
J. B. Turpin,* Plymouth	1,146	0	0

*Accepted

Plymouth.—For making certain alterations and additions at the Devon and Cornwall Homœopathic Hospital, Lockyer Street, for the Trustees. F. A. Wiblin, architect and surveyor, Plymouth. Each contractor sent in three tenders, the following result being the total of Nos. 2 and 3 only:—

Lapthorne and Son	£5,069
R. Wilkins and Sons	4,704
J. W. T. Trevan	4,569
Shepherd	4,445
Wakeham Bros.	4,355
E. Portor	4,293
J. Allen	4,129
E. E. Endicott	4,083
D. Carwithen	4,063
Stevenson	3,974
G. B. Turpin	3,957
A. Andrews	3,875
T. Roberts	3,801
F. J. Stanbury	3,757
A. N. Coles	3,702
Pearn Bros.*	3,374

*Accepted.

Swansea.—For erection of lodging house in Fisher Street, Swansea. Mr. H. A. Ellis, M.A., M.S.A., architect, Swansea:—

T. Richards	£3,250
Lloyd Bros.	3,230
H. Billings	3,170
J. and F. Weaver, Manselton	3,150
J. and D. Jones,* St. Helen's Yard	3,140

All of Swansea. Architect's estimate, £3,245.

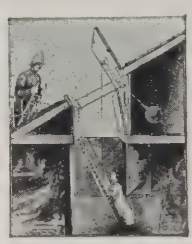
*Accepted.

West Hartlepool.—For erection of the Empire Theatre, for Mr. Richard Thornton. Messrs. W. and T. R. Milburn, FF.R.I.B.A., architects, 20, Fawcett Street, Sunderland:—

Garvie and Sons	£15,073	0	0
Watt Bros.	14,923	0	0
E. M. Tweddle	14,718	0	0
Clerey and Charlton	14,626	0	0
D. and J. Ranken	14,444	0	0
W. W. Brazell	14,204	13	5
J. W. White	14,100	0	0
A. Pringle	14,081	0	0
Davidson and Miller	13,977	12	7
Parkinson and Sons	13,916	18	6
S. Easten, Ltd.	13,751	1	3
J. Huntley	13,710	0	0
H. C. Howe	13,431	8	4
W. Pearson	13,161	0	0
J. Proud	13,128	0	0
J. Howe and Co.,* West Hartlepool	12,746	0	0

*Accepted.

THE BAFECO PATENT
AUTOMATIC
TRAP-DOOR FIRE ESCAPE.
BURGLAR PROOF.



FIRE DOWNSTAIRS
Escaping to the Roof

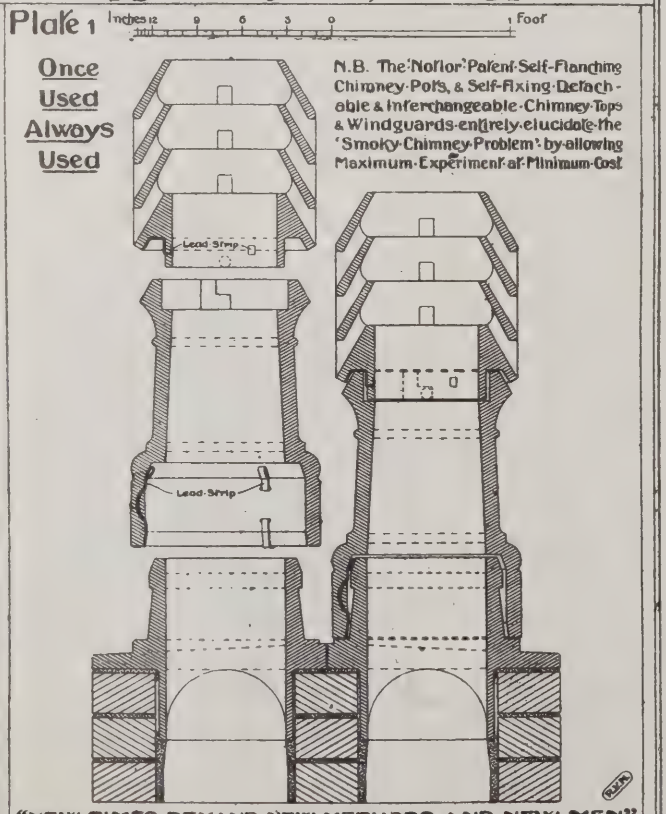
SIMPLE.
CHEAP.
EFFICIENT.

Easily Fixed.!
A child can operate it.
A 'Bafeco' Roof-Escape safeguards at a trifling cost. the lives of a whole household against Fire.
Full particulars and prices from
THE BUILDING ACTS FIRE ESCAPE CO.,
4, Southampton Row, W.C.
Telephone 2366 CENTRAL.

A·REVOLUTION·IN·CHIMNEY·POTS.
Advantages·Many—Disadvantages·None.

Once Used Always Used

N.B. The 'Notlor' Patent Self-Flanching Chimney Pots, & Self-Fixing Detachable & Interchangeable Chimney Tops & Windguards entirely elucidate the 'Smoky Chimney Problem' by allowing Maximum Experiment at Minimum Cost



"NEW·TIMES·DEMAND·NEW·METHODS·AND·NEW·MEN."
Copyright.

NOTLEY & TAYLOR.
Finsbury·Pavement·House,
TELEPHONE: London, E.C. 2198 CENTRAL

Experts & Specialists in the Prevention and Cure of Smoky Chimneys.

THE HOUSE FOR
ALL DRAWING OFFICE REQUIREMENTS.

LINEFAST PHOTO COPIES ON TRACING CLOTH,
Equivalent to Hand Made Tracings.
Sample print free.

CATALOGUES POST FREE.
B. 1.—DRAWING INSTRUMENTS.
B. 2.—SLIDE RULES, SCALES, CURVES.
P. 3.—COLOURS, INKS, PENCILS, RUBBERS.
B. 4.—DRAWING TABLES, CABINETS, BOARDS.
B. 6.—PHOTO PRINTS AND APPARATUS.
B. 8.—TRUE SCALE (ORDOVERAX) COPYING.

B. J. HALL & CO., LTD.,
HEAD OFFICE,
39, VICTORIA ST., LONDON, S.W.

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about **five days** after the date of this issue.

Unless expressly stated to the contrary, all deposits required for bills of quantities, etc., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

June 1—3. **UPTON PARK.**—Decorative repairs at the schools, Green Street, Upton Park, E., for the guardians of the poor of the parish of St. George-in-the-East. Specification upon personal application to R. Murray Lochner, clerk, guardians' offices, Raine Street, Old Gravel Lane, E.

June 5—22. **HELSBY.**—Erection of new school for 200 children at Helsby, for the Cheshire C.C. Application may be made for bills of quantities to the architect, Joseph Holt, A.R.I.B.A., 9, Albert Square, Manchester, not later than June 5, after which date bills of quantities will be issued, and drawings, specifications and conditions of contract may be inspected at 9, Albert Square. All applications must be accompanied by a deposit of £2. Tenders, marked "Helsby New Council School," must be sent to Geo. F. Ashton, clerk to the sub-committee, 71, High Street, Runcorn.

June 7. **PONTYPOOL.**—Erection of a hall in connection with St. James's Church, Pontypool, for the Rev. G. Gower (vicar) and committee. Plans, etc., of D. J. Lougher, architect, Bank Chambers, Pontypool, to whom tenders are to be sent.

June 7. **BRIDLINGTON.**—Erection of new buildings in extension of the Bridlington high school for girls. Drawings, etc., on deposit of £1 with John Bilson, architect, 23, Parliament Street, Hull. Tenders to be delivered to Geo. G. O. Sutcliffe (clerk to the governors), solicitor, Bridlington.

June 7. **ROBERT TOWN.**—Alterations (all trades) to the Wesleyan Church, Robert Town. Drawings and specifications in the vestry. The architect will be in attendance to answer questions on Tuesdays and Thursdays, from 4.30 p.m. to 5.30 p.m. Tenders to be sent to E. Vincent King, A.R.I.B.A., architect, 24, Westgate, Dewsbury.

June 7. **COVENTRY.**—Erection of proposed workshop, Dale Street, for the Triumph Cycle Co., Ltd. Plans and specification by Herbert W. Chattaway, architect, Trinity Churchyard, Coventry, may be seen, and all particulars obtained, of Herbert W. Chattaway, architect, Trinity Churchyard, Coventry, to whom tenders are to be sent.

June 7. **AWBRIDGE (SOUTHAMPTON).**—Erection of an additional classroom for forty children, and a cloakroom at Awbridge council school, for the C.C. Plans, specification, and conditions (no quantities), of W. J. Taylor, county surveyor, The Castle, Winchester. Tenders to be delivered to H. Barber, clerk of the C.C., The Castle, Winchester.

June 7. **RAVENSTHORPE (YORKS).**—Erection of a new club and caretaker's house in Foundry Street, Ravensthorpe, for Ravensthorpe Liberal Club. Plans and specifications, for masons, joiners, slaters, plasterers and plumbers may be seen on application to the caretaker of the club, 238, Huddersfield Road. Tenders to be sent to J. C. Cartwright, Craven Street, Ravensthorpe.

June 7. **ECCLES.**—Erection of three shelters in the recreation grounds, also supplying labour in fixing a Jarrah wood fence in the Winton recreation ground, for the corporation. Erection of a hose drying tower in the town's yard, Patricroft, for the watch committee. Plans, etc., may be seen at the office of the borough surveyor, of whom bills of quantities may be obtained on receipt of £1 1s.

June 8. **BARROW-IN-FURNESS.**—Alterations to windows, Rawlinson Street Schools, for the corporation. Plans, bills of quantities and forms of tender of the borough engineer, town hall, to whom tenders are to be sent.

June 8. **SPENNYMOOR.**—Construction of a subway under the North Eastern Railway, for the Spennymoor and Tudhoe Gas Company. Plans and specifications at the company's offices, 32, Thomas Street, Spennymoor, where tenders are to be delivered.

June 8. **USK (Mon.).**—Erection of a new council school, to accommodate 96 children, at Usk, for the Monmouthshire education committee. Plans and specification and bills of quantities on deposit of £2 2s., with C. Dauncey, C.C. offices, Newport, to whom tenders are to be sent.

June 8. **CONISBOROUGH.**—Alterations to conveniences, erection of playsheds, etc., etc., at Conisborough Morley Place provided school (builder, joiner, slater, plumber, plasterer, painter, asphalter, and heating engineer), for the West Riding C.C. Bills of quantities, whole or separate tenders, of W. R. Hudson, Education Offices, Mexborough.

June 8. **BIRMINGHAM.**—Erection of chimney stack and extensions to engine foundations, etc., at electric generating station, Summer Lane, Birmingham, for the corporation. Applications before May 22, of the architects, Ewen Harper and Brother, Ruskin Chambers, 191, Corporation Street, Birmingham. Tenders to the chairman of the electric supply committee, Council House, Birmingham. £2 2s. deposit. Fair wages clause.

June 9. **MARYTAVY, near TAVISTOCK.**—Alterations and additions to North Warne Farmhouse. Plans, etc., at the Farmhouse by appointment, or with Morley B. Collins, architect, Redruth, to whom tenders are to be sent.

June 9. **WORKINGTON.** Erection of a house on the Seaton Road, for Mrs. Byrnes. Plans and specifications may be seen upon application to W. G. Scott and Co., architects and surveyors, 2, Park Lane, Workington.

June 9. **NEW SOUTHGATE, N.**—Erection of a new postal sorting office at New Southgate, for the Commissioners of H.M. Works and Public Buildings. Drawings, etc., of J. Wager, A.R.I.B.A., H.M. Office of Works, Westminster, on deposit of £1 1s. Tenders to be sent to the secretary, H.M. Office of Works, etc., Storey's Gate, S.W.

June 9. **HULL.**—Erection of a superintendent's house in the Pearson Park, for the corporation. Drawings and specification of Joseph H. Hirst, city architect, town hall, Hull, and quantities on deposit of £2 2s., to be made payable to the city treasurer. Tenders to be addressed to the chairman of the parks and burial committee, town clerk's office, Hull.

June 9. **LONDON.**—Enlargement of the Isolation Hospital, Tottenhall Road, Palmer's Green, consisting of:—(a) extension of the administrative block, (b) erection of a ward block for twelve beds, (c) extension of the isolation block, for the Southgate U.D.C. Plans and specification at the offices of the council, Palmer's Green, bills of quantities on depositing with the surveyor £2 2s. Tenders to be sent to W. M. Ellenor, clerk to the council, council offices, Palmer's Green, N.

June 10. **SMEETH.**—Execution of summer repairs, to be carried out at Smeeth council school, for the Kent education committee. Specifications and further information at the office of J. Tippen, Wye, Ashford, Kent; or of Mr. Walker, School House, Smeeth.

June 10. **SEDBERGH.**—Erection of a new Wesleyan chapel and schools at Sedbergh. Quantities from the architect, A. E. Lambert, 22, Park Row, Nottingham, on payment of £1 1s. Plans at the Wesleyan Sunday school, Sedbergh. Tenders to be sent to the Rev. R. W. Davidson, Wesley Villa, Sedbergh.

June 10. **TREHERBERT.**—Erection of new premises at Treherbert for the Conservative club. Plans and specification at the offices of J. Rees and Son, architects, Pentre, and bills of quantities on deposit of £2 2s. Tenders to be addressed to the "Chairman of Committee," Conservative Club, Treherbert.

June 10. **LONDON.**—Execution of masonry, plastering, joinery, glazing, plumbing, etc., at the new Western District post office, Wimpole Street (2nd contract), for the Commissioners of H.M. Works and Public Buildings. Drawings, etc., of J. Wager, A.R.I.B.A., H.M. Office of Works, Westminster, on deposit of £1 1s. Tenders to be sent to the secretary, H.M. Office of Works, etc., Storey's Gate, S.W.

June 10. **WHISTON.**—Erection and completion of a new block for male mental cases at the workhouse, Whiston, for the Prescot guardians. Quantities of Jas. Gandy, architect, Masonic Buildings, St. Helens, on deposit of £2 2s. Also alterations to cottage at the nurses' home, Whiston. Quantities as above on deposit of 5s. Also cleaning and painting a portion of the hospital buildings. Specification as above on deposit of 5s.

June 11. **BUCKIE (SCOTLAND).**—Mason, carpenter, slater, plasterer, plumber, painter, and glazier works of additions to the Masonic Institute, Buckie. Plan and specifications, at the institute, Buckie. Tenders with D, and J. R. M'Millan, architects, 105, Crown Street, Aberdeen, marked "Tender for Masonic Hall," by June 11.

June 12. **ANNALONG (CO. DOWN).**—Erection and completion of Linton memorial hall, Annalong. Plans, etc., of Henry Seaver, architect, 16, Donegall Square South, Belfast, and also at the Rectory, Annalong.

June 12. **LERWICK.**—Erection of a block of working men's dwellings. Plans, etc., on deposit of £1 with Arthur Sandison, factor for the trustees of Feuars and Heritors, of Lerwick, town hall, Lerwick, to whom tenders are to be sent.

June 12. **LISKEARD.**—Erection of a workshop, cycle shed, at the County School, for the Cornwall Education Committee. Plans, etc., may be had of the architect, J. Sansom, Liskeard. Tenders to be sent to F. R. Pascoe, secretary to the county committee, Education Office, Truro.

June 14. **NEWBURY.**—Erection of new offices for the Newbury T.C. Particulars may be obtained at office of S. J. L. Vincent, A.M.Inst.C.E., borough surveyor, Mansion House Street, and quantities on deposit of £5 Bank of England note. Only builders residing within five miles of Newbury are invited to tender.

June 14. **HALIFAX.**—Various trades in alterations at sundry schools, painting, etc. (at the public libraries and museums), for the Education and Public Library Committee. Plans and specification etc., of James Lord, M.I.C.E., borough engineer, town hall, Halifax, on deposit of £1. Tenders to be sent to W. H. Ostler, secretary. Fair wages clause.

June 14. **PORTSMOUTH.**—Erection of a teachers' room and a cloakroom at the George Street council school (girls' department), for the education committee. Form of tender, specification, etc., of the surveyor, A. H. Bone, Cambridge Junction, Portsmouth. Tenders to be sent to the committee's offices, town hall, Portsmouth. Fair wages clause.

June 15. **BALLYMOE.**—Additions and alterations to Ballymoe Church for the Very Rev. James Martin, P.P. Plans, etc., can be seen at the Presbytery, Ballintubber, or at office of William H. Byrne and Son, architects, 20, Suffolk Street, Dublin.

June 16. **MERSHAM (KENT).**—Execution of summer repairs required at the council school, for the Kent Education Committee. Specifications, etc., of H. Hamilton, 11, Bank Street, Ashford, Kent, to whom tenders are to be sent.

June 16. **BELFAST.**—Additions and alterations to the general post office, Belfast, for the Board of Public Works. Plans, etc., of the quantity surveyor, Samuel C. Hunter, 2, Wellington Place, Belfast, also of H. Williams, secretary, office of public works, Dublin, where particulars may be obtained on deposit of £3.

June 16. **AVONMOUTH.**—Construction and maintenance, for twelve months after completion, of a passenger station at the Royal Edward Dock, Avonmouth, for the docks committee. Specification, schedule, form of tender, and form of contract, etc., of W. W. Squire, engineer, Cumberland Road, Bristol, upon the production of a receipt for £5 from the secretary, 19, Queen Square, Bristol. Tenders must be sent to the secretary of the Docks Committee, 19, Queen Square, Bristol.

June 16. **GLASGOW.**—Alterations and additions to the Port-Dundas electricity station, for the corporation: (1) Brick and mason work; (2) painter work; (3) carpenter, joiner, glazier and ironmongery work; (4) slater work; (5) plumber work; (6) reinforced concrete work; and (7) iron and steel work. Plans and specifications and forms of offer on application to W. W. Lackie, electrical engineer, 75, Waterloo Street, on deposit of £2. Tenders to be sent to A. W. Myles, town clerk, City Chambers, Glasgow.

June 17. **LONDON.**—Pointing and other sundry external works at St. George's workhouse, Mint Street, Borough, S.E., for the Southwark Union. Specification, conditions of contract, and forms of tender of the architect, A. J. Wade, 104, Harvist Road, Kilburn, N.W., on deposit of £2 2s. Tenders to be sent to Sydney Wood, clerk, union offices, John Street West, Blackfriars Road, S.E. Fair wages clause.

June 18. **SWANAGE.**—Enlarging the council school for the Dorset County Education Committee. Plans and specifications may be seen at the town hall, Swanage. Tenders are to be sent to the secretary, County Education Office, Dorchester.

June 19. **BACUP.**—Extensive alterations and additions to the St. Saviour's council school, Bacup. Plans, etc., of borough engineer, Municipal Buildings, Bacup, on deposit of £2 2s. Tenders to be sent to Joseph Entwistle, town clerk, Bacup, municipal buildings, Bacup.

June 23. **WINCHESTER.**—Erection of a new secondary school (for 160 girls) at Winchester, for the C.C. of Southampton. Plans, specification, and conditions of contract, and bills of quantities, etc., of W. J. Taylor, county surveyor, The Castle, Winchester. Deposit of £5 5s. by cheque, payable to the Hants C.C. and crossed Bank of England. Tenders to be delivered to H. Barber, clerk of the C.C., The Castle, Winchester.

June 29. **REDGRAVE.**—Enlargement of the school for the managers. Plans and specifications of the Rector, Redgrave

No date. **BLANDFORD.**—Erection of a cottage. Particulars may be obtained upon application to B. Baker, Milborne, St. Andrew, Blandford.

No date. **ASPATRIA.**—Erection and completion of two brick dwelling-houses at Brayton Road, Aspatria. Plans and specifications may be seen with R. Kirkbride, 49, Park Road, Aspatria.

No date. **COVENTRY.**—Repairs, decorations, etc., at Exhall Church, near Coventry. Particulars may be obtained upon application to T. F. Tickner, F.R.I.B.A., architect, High Street Chambers.

No date. **CRAGHEAD.**—Erection of a new church at Craghead (whole or any portion of the works). Names, together with a deposit of £1 1s., to Jas. W. Thompson, architect, 63, Grey Street, Newcastle-on-Tyne.

No date. **LLANWRTYD WELLS.**—Erection of hotel and alterations and additions to premises at Llanwrtyd Wells, for J. T. Evans, J.P. Names to Alfred Swash, F.R.I.B.A., Midland Bank Chambers, Newport, Mon, from whom particulars may be obtained.

ENGINEERING.

June 8. **LEEDS.**—Supply of one 100 h.p. motor, for the tramways committee of the corporation. Specification and form of tender may be obtained on application at the tramways general office.

June 8. **BELFAST.**—Construction of a ferro-concrete sludge tank, timber jetty, and approaches for the corporation. Drawings, etc., at the office of the city surveyor on deposit of £1 1s. Tenders to be sent to R. Meyer, town clerk, pro tem.

June 8. **MOUNTAIN ASH.**—Supplying and delivering to Penrhiwceiber gas works materials, and executing labour in re-setting from foundations two (2) regenerative settings of six (6) retorts, and rebuilding one (1) bed of six (6) retorts from floor level, in existing empty arches, for the U.D.C. The council will provide the retorts and all ironwork except retort bolts. Particulars from W. G. Thomas, surveyor, town hall, Mountain Ash. Tenders to be sent to H. P. Linton, clerk to the council, town hall, Mountain Ash.

June 9. **SCULCOATES (East Yorkshire).**—Supply and erection of a 15 kilowatt D.C. dynamo, driven by a steam turbine or high speed engine, for the Union. Specification and form of tender from W. J. Coles, of Maxted, Knott and Coles, Burnett Avenue, Hull, on deposit of £1 1s. Tenders to be sent to J. H. Wild, solicitor, clerk to the guardians, 12, Harley Street, Hull. Fair wages clause.

June 10. **DUDLEY.**—Supply, delivery, and erection of a motor generator with switchgear, for the corporation. Specification, etc., from the borough electrical engineer, electricity works, Bull Street, Dudley, on deposit of £1 1s. Tenders to be delivered to Hy. C. Brettell, town clerk, town hall, Dudley.

June 11. **LEIGH (Lancs.).**—Construction of additional works of sewage disposal, sewage works, Mather Lane, Leigh, for the sewerage board of Leigh and Atherton. 1, construction of two additional precipitation tanks, two detritus tanks, six circular percolating filters, each 100ft. diameter; dynamo and pump house, receiving wells, pressure and sludge tanks, effluent conduits, pipes, and other works in connection therewith; 2, sludge presses, carrying belt, sludge pumps, and screens; 3, high speed steam engines and centrifugal pumps; 4, high speed vertical steam engines and dynamos, motors, cables, and electric lighting; 5, sludge ejectors; 6, distributing arms to percolating filters. Drawings for contract No. 1 of the engineers, Banks, Fairclough and Stephen, A.M.I.C.E., Leigh, Lancashire, on deposit of £5 5s. Specification for other contracts from the engineers, on deposit of £1 1s. Tenders to be delivered to Daniel Schofield, clerk to the joint board, town hall, Atherton.

June 12. **MONMOUTH.**—Supply and erection of a locotype boiler, centrifugal sewage pump, steel shafting, framework, and piping, in connection with the sewage pumping station, for the corporation. Specifications, forms of tender and blue prints, at the office of the town clerk, Monmouth, and at the office of the engineer, at Swansea. Copies of each may be obtained upon application to A. W. Blake, A.M.I.Mech.E., A.M.I.E.E., 4, Castle Square, Swansea, and payment of 5s., which will not be returned. Tenders must be delivered to Bickerton H. Deakin, town clerk, Monmouth.

June 16. **MANCHESTER.**—Electric light installation at offices in New Bridge Street, Manchester, for the board of guardians. Specifications, etc., on deposit of £1 1s., to be sent to James Macdonald, clerk to the guardians, Poor Law Offices, New Bridge Street, Manchester.

June 18. **BRADFORD.**—Construction of about 1,760 yards of 3ft. 6in. by 2ft. 4in. egg-shaped sewer in brick and concrete, and about 1,260 yards of 24in. stoneware pipe sewer, together with manholes, storm water overflow chamber, and sewer connections, for the corporation. Plans, specification, conditions of contract, and form of tender from Joseph Garfield, Assoc.M.Inst.C.E., sewage works, engineer, Esholt Hall, Shipley, on deposit of £3 3s. Tenders to be sent to Frederick Stevens, town clerk, town hall, Bradford. Fair wages clause.

IRON AND STEEL.

June 8. **LEWISHAM.**—Supply and delivery of about 366 yards of iron fencing and seven gates at St. Mary's Churchyard, High Street, Lewisham, for the corporation. Drawings, specification, and forms of contract, also forms of tender, at the town hall, Catford (surveyor's department). Tenders must be sent to Edwd. Wright, town clerk, town hall, Catford, S.E. Fair wages clause.

June 8. **LONDON (for India).**—Supplying (1) Iron wire fencing (1325 tons), comprising struts, wedges, straining screws, wire, and 80,000 bases; (2) spoke wheels with axles, 250 pairs; (3) springs, 500 laminated bearing springs, 1,250 helical springs, for the South Indian Railway Company (Limited). Specifications and forms of tender may be obtained of V. E. De Broe secretary, 91, York Street, Westminster S.W., to whom tenders are to be sent. A charge (which will not be returned) of £1 for each copy of specification 1, and 10s. for each copy of 2 and 3. Copies of the drawings may be obtained of Robert White, M.I.C.E., consulting engineer to the company, 3, Victoria Street, Westminster, London, S.W., on payment of 5s. per sheet.

June 15. **LINCOLN.**—Supply of valves, etc., for the corporation. Specification and form of tender and drawings of Neil McK. Barron, waterworks engineer, Lincoln, upon production of a receipt from the city accountant for £5 5s. Tenders, addressed to the chairman of the waterworks committee, to be delivered to W. T. Page, deputy town clerk, Bank Street, Lincoln.

June 15. **LINCOLN.**—Supply of about 12,600 tons of cast-iron pipes, and special castings 21in. diameter, for the corporation. Specification and form of tender and drawings of Neil McK. Barron, waterworks engineer, Lincoln, upon production of a receipt from the city accountant for £5 5s. Tenders, addressed to the chairman of the waterworks committee, to be delivered to W. T. Page, deputy town clerk, Bank Street, Lincoln.

PAINTING.

June 2—14. **WEST HAM.**—Cleansing, repairs, and painting of schools during the summer vacation, for the corporation. Written application to William Jacques, A.R.I.B.A., architect to the education committee, 2, Fen Court, Fenchurch Street, E.C., for specification and form of tender, by June 2, accompanied by a deposit of £1 (cheques not accepted). Tenders must be delivered by registered post at the Educational Department, 25, The Grove, Stratford. Fair wages clause.

June 7-17. **CLEETHORPES (Lincs.).**—Painting the exterior of Elliston Street council school at Cleethorpes; also tarring and sanding playgrounds, for the Lindsey C.C. Education Committee. Bills of quantities and form of tender of Scorer and Gamble, architects, Bank Street Chambers, Lincoln, on or before June 7, and on deposit of £1 1s. Tenders to S. Maudson Grant, secretary, 286, High Street, Lincoln.

June 8. **LONDON.**—Painting and other works at the infirmary in Harrow Road, for the guardians of the poor of the parish of Paddington. Specification and form of tender at the offices of the architect, E. Howley Sim, Mowbray House, 14, Norfolk Street, Strand, W.C., on deposit of £1 (cheque). Tenders to be sent to Henry F. Aveling, clerk to the guardians, Guardians' offices, 313-319, Harrow Road, W.

June 9. **WAKEFIELD.**—Painter's work at the Infectious Diseases Hospital, Park Lodge Lane, for the corporation. Specification and conditions at the town clerk's office. Tenders to be delivered to the town clerk, town hall, Wakefield.

June 9. **SUTTON, SURREY.**—Cleaning and painting works and repairs at the Downs School, Sutton, Surrey, for the Metropolitan Asylums Board. Conditions of contract, etc., at the office of the Board, Embankment, E.C., on deposit of £1.

June 11. **WARRINGTON.**—Painting various schools, for the cities and buildings committee. Specifications, etc., of the borough surveyor, town hall, where tenders must be delivered. 10s. 6d. deposit.

June 12. **RAMSBOTTOM.**—Beautifying St. Paul's Church, Ramsbottom. Specifications on personal application to the Vicar.

June 19. **MACCLESFIELD.**—Outside painting of the infirmary annexe and nurses' home at the Parkside Asylum, for the C.C., of Chester. Specification, etc., of H. Beswick, county architect, Chester. Tenders to be sent to A. C. Procter, clerk to the committee of visitors, 23, King Edward Street, Macclesfield.

PLUMBING AND SANITARY.

June 7. **HASTINGS.**—Erection of a public convenience in Fairlight Road, St. Helens, Hastings, for the corporation. Drawings, etc., of the borough engineer, P. H. Palmer, M.I.C.E., town hall, Hastings. Tenders to be sent to Ben. F. Meadows, town clerk, town hall, Hastings.

June 7. **HEXHAM.**—Construction of about 6,000 yards of 15-in., 10-in., 9-in., and 6-in. glazed earthenware pipe sewers, with manholes, lampholes, etc., for the R.D.C. Plans, etc., of the engineer, J. E. Parker, A.M.I.C.E., Post Office Chambers, St. Nicholas' square, Newcastle-on-Tyne, on deposit of £1 1s. (cheque). Tenders to be sent to H. Nicholson, clerk to the council, Hexham.

June 7. **SOUTHOWRAM.**—Construction of a main pipe sewer from Brookfoot to Cromwell Wood Bottom, about 1,800 yards in length, together with the necessary manholes and other appurtenant work, for the U.D.C. Plans, etc., from the office of Frank Massie, M.Inst.C.E., Tetley House, Kirkgate, Wakefield, on deposit of £2 2s. Tenders to be sent to R. W. Evans, clerk to the council, Commercial Bank Chambers, Halifax.

June 7. **NEW MALDEN (Surrey).**—Construction of a deep intercepting sewer, 9 inches diameter, and other drainage work and lavatories at the farm buildings, Norbiton Common Farm, New Malden, for the Kingston Union. Drawings and specification, etc., of the architect, William H. Hope, C.E., 12, Clarence Street, Kingston-on-Thames. Tenders to be delivered to Chas. W. Dash, clerk to the guardians, union offices, Kingston-on-Thames. Fair wages clause.

June 8. **SEACROFT.**—Drainage work on the Killingbeck Hospital Estate, Seacroft, for the corporation of Leeds. Plans, etc., of the steward, Seacroft Hospital. Tenders to be sent to Robert E. Fox, town clerk.

June 8. **HANDSWORTH (STAFFS).**—Sewering Albion Road, under the Public Health Act, 1875, section 150, for the U.D.C. All particulars on application to H. Richardson, Assoc.M.Inst.C.E., surveyor to the council, to whom tenders are to be sent. Fair wages clause.

June 25. **SUTTON COLDFIELD.**—Sewering and draining Hill and Streetly Districts, and laying a length of sewer in Riland Road, including manholes, sewage lift, flushing chambers, etc., for the corporation. Specification, form of tender, and bills of quantities on deposit of £5. Tenders to be addressed to the town clerk, Council House, Sutton Coldfield.

June 28. **ANSTON.**—Laying about 3,900 yards of 9in. and 6in. stoneware pipe sewers, construction of manholes, tanks, filters, and other appurtenant works at Anston, for the Kiveton Park R.D.C. Drawings and copies of the specification, bill of quantities, and form of tender at the offices of the engineers, Berrington, Son and Watney, Bank Buildings, Lichfield Street, Wolverhampton, and 28, Victoria Street, Westminster, S.W., on deposit of £5s. 5s. Tenders must be delivered to James Snow Whall, solicitor, clerk to the council, 66, Bridge Street, Worksop.

ROADS AND CARTAGE.

June 7. **CLAYTON, NEAR BINGLEY (Yorks.).**—Repairing and re-surfacing asphalted playgrounds at Clayton provided school. Particulars may be obtained from H. Horrox, education offices, Bingley, to whom sealed tenders must be sent.

June 7. **TUNBRIDGE WELLS.**—Forming and shaping roads and laying sewers, etc., at the Southwood Building Estate. Drawings and specifications on deposit of £2 2s. with Richardson and Duttson, surveyors, 52, Mount Pleasant Road, Tunbridge Wells, to whom tenders are to be sent.

June 7. **WANDSWORTH.**—Making-up and paving Rectory Lane, Tooting, for the corporation. Specification and drawings, and forms of tender, at the borough engineer's office, new streets department, 56, East Hill, Wandsworth, S.W. Tenders to be delivered at the Council House, East Hill, Wandsworth, S.W. Fair wages clause.

June 7. **BALHAM.**—Making-up and paving Eatonville Road, Balham, for the corporation of Wandsworth. Specification, etc., of the borough engineer, streets department, 56, East Hill, Wandsworth, S.W. Tenders must be delivered at the Council House, East Hill, Wandsworth, S.W. Fair wages clause.

June 7. **WANDSWORTH.**—Making-up and paving Waldron Road, Springfield, for the corporation. Specification and drawings and forms of tender at the borough engineer's office, New Streets Department, 56, East Hill, Wandsworth, S.W. Tenders must be delivered at the council house, East Hill, Wandsworth, S.W. Fair wages clause.

June 7. **ROMFORD.**—Supply of 500 tons of best quality blue Guernsey granite, broken to 1½in. cube, and 300 tons of best quality blue Guernsey granite, broken to 2 in. cube; also 400 tons of Rhenish basalt stone, broken to 2 in. cube, for the R.D.C. Specification and form of tender from George Lapwood, highway surveyor, Victoria Chambers, Romford. Tenders to be sent to William Smith, clerk to the council.

June 8. **TOTTENHAM.**—Making up Boundary Road (3rd section), Chaplin Road, and Olinda Road, for the U.D.C. Plans, etc., of W. H. Prescott, A.M.I.C.E., engineer to the council, The Green, Tottenham. 10s. 6d. deposit for quantities. Persons tendering must, when handing in tenders, deposit £5 (Bank of England note, or cash), for each road. Tenders to be sent to Edward Crowne, clerk of the council, Tottenham. Fair wages clause.

June 9. **SUTTON, SURREY.**—Road repairing and granolithic paving at the Belmont Stables, Sutton, for the Metropolitan Asylums Board. Drawing, conditions of contract, specification, and form of tender, at the office of the Board, Embankment, E.C., on deposit of £1.

June 9. **HESSLE.**—Repair of the roadway, etc., at the rear of the cottage homes, for the Sculcoates Union. Specification and form of tender of the architect and surveyor, T. Beecroft Atkinson, M.S.A., 11, Trinity House Lane, Hull. Tenders to be sent to J. H. Wild, solicitor, clerk to the guardians, union offices, Harley Street, Hull. Fair wages clause.

June 10. **CASTLEFORD.**—Improving various streets, for the U.D.C. Plans and specifications prepared by W. Green, surveyor to the council, of whom further particulars may be obtained. Tenders to be sent to H. H. Broadbent, clerk to the council, council offices, Castleford.

June 10. **MIDDLETON.**—Supplying about 6,000 tons of granite setts, for the corporation. Further particulars and form of tender may be obtained on application to William Welburn, borough surveyor, town hall, Middleton. Tenders, addressed to the chairman of the surveyor's committee, accompanied by samples, to be sent to Frederick Entwistle, town clerk, town hall, Middleton.

June 11. **CROSSGATES, BARWICK-IN-ELMET.**—Macadamising, kerbing, channelling (with asphalte footpaths on front streets) various private streets, for the Tadcaster R.D.C. Plans, etc., at the office of Spinks, Pilling and Rodwell, engineers and surveyors, 20, Park Row, Leeds, from whom bills of quantities and form of tender may be obtained on deposit of £1 1s. Tenders to be sent to Geo. A. Bromet, solicitor, clerk, Tadcaster.

June 14. **LONDON.**—Making-up the mewsway of Hayden's Place, Portobello Road, for the corporation of Kensington. Plan, etc., at the borough engineer's department, town hall, Kensington. Tenders to be sent to Wm. Chambers Leete, town clerk, town hall, Kensington, W. Fair wages clause.

June 16. **RYE (SUSSEX).**—Carrying out a sewerage scheme for the drainage of Rye Harbour Sussex, for the R.D.C. Drawings, etc., on deposit of a £5 Bank of England note, with the engineer, T. J. Mossflower, C.E., Carlton Chambers, Bristol, on and after May 27, and at 28, Victoria Street, Westminster, on June 11. Tenders to be delivered to Theodore J. Smith, clerk to the R.D.C. Flushing House, Rye.

June 21. **STEVENAGE.**—Supply of 1,000 tons (more or less) 1¾in. to 2in., 1½in. to 1¾in., and 1in. to 1¼in. broken Guernsey, Leicester, or other granite, for repair of roads, to be delivered at Stevenage railway station and sidings (G.N.R.), for the U.D.C. Tenders, accompanied by samples, to be delivered to Wm. Onslow Times, clerk to the council, council offices, Orchard Road, Stevenage.

MISCELLANEOUS.

June 8. **MANCHESTER.**—Laying and jointing the northern section of the third line of pipes from Thirlmere to Manchester, for the Corporation. Plans and drawings and printed specification, schedule of quantities, and form of tender (except during Whit week) at the offices of G. H. Hill and Sons, civil engineers, Albert Chambers, Albert Square, Manchester, and 3, Victoria Street, Westminster, on deposit of £5 5s. Tenders, endorsed "Thirlmere Aqueduct: Contract A: Tender for Laying, etc., Cast-iron pipes," and addressed to the chairman of the waterworks committee, must be forwarded to the secretary, waterworks offices, town hall, Manchester, by June 8.

June 8. **WITHERNSEA.**—Execution of whole or parts of the following works, for the U.D.C.:—Cemetery — (a) laying out and draining shrubs, trees, and planting. Mere Land Gardens — (a) draining and laying out; (b) iron fencing and gates, wood fencing. Groynes—(a) constructing three timber groynes. Sea-wall — (a) concreting path and constructing road and steps; (b) collecting about 600 tons of stone from the foreshore. New sea-wall, slipway, and road—(a) Constructing wall and road; (b) supplying and fixing iron handrails. Lavatories—(a) Constructing shops and lavatories; (b) providing and fixing suction pipes. Plans and specifications of the surveyor, J. H. B. Kirton, Exchange Buildings, Lowgate, Hull. Tenders to be sent to Fredk. J. Gardam, clerk to the council, 16, Parliament Street, Hull.

June 15. **LONDON.**—Supply and delivery of cupboards, tables, carpenters' benches, laundry furniture, etc., for the L.C.C. Full particulars on application to G. L. Gomme, clerk of the L.C.C., county hall, Spring Gardens, S.W., to whom tenders are to be sent.

Readers who are not subscribers are invited to apply for the terms upon which Free Insurance Coupons are granted. Apply to the Manager, Technical Journals, Limited, Caxton House, Westminster.

This form should be cut out and sent with remittance to: The Manager, "THE BUILDERS' JOURNAL," Caxton House, Westminster.

"THE BUILDERS' JOURNAL"

PREPAID ADVERTISEMENT FORM.

PLEASE WRITE CLEARLY.

Advertisements must reach Caxton House not later than 5 o'clock Monday.

4 LINES (about 28 words)

28 WORDS.

6d. extra for every additional line about 7 words.

An advertisement costing **1/6** can be inserted 3 times for **3/-** (the price of 2 insertions).

The price quoted on this Form applies only to "Situations Wanted" For other Rates see page vi.

Box numbers will be allotted to advertisers free of charge, and replies addressed to a Box Number can be forwarded to the advertiser per post upon request. Postage of uch parcels will be charged, but rolls or parcels of drawings in reply to advertisements are not accepted.

Advertisements are accepted for 3 insertions for the price of two, and six announcements are given free in the Employment Register to advertisers seeking situations who order three insertions of their advertisement (see "Employment Register").

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE Draughtsman (24), 9 years' experience; structural and ornamental ironwork, desires post in London or Southampton, office or outdoor.—Z., 36, Bartholomew Villas, London, N.W. 5082

ACADEMY (Royal) exhibitor prepares perspectives on moderate terms; specimens sent; also designs, plans from rough sketches, drawings, tracings, competition work, etc.—Box 4983, Builders' Journal Office.

ADVERTISER, with six years' practical experience and a knowledge of bookkeeping and office routine, desires situation in builder's or estate agent's office.—C. J. Mountei, 24, Hillfield Road, West Hampstead, N.W. 5028

A "B.B.B."—The British Business Bureau (Architects) 140, Fleet Street, E.C., can recommend several first class assistants. Particulars free on application. No fees. 5066

ADVERTISER, (30), seeks situation in Drawing Office rapid tracer, colourist, good printer; used to making tracings for reproduction. Experience gained in architects' offices.—Box 5057, Builders' Journal Office.

ARCHITECT. Surveyor and Constructional Engineer fully qualified, seeks engagement, 15 years' experience, moderate salary; would represent good constructional firm.—Box 5063, Office of the Builders' Journal.

ADVERTISER seeks position as junior assistant, 3½ years' experience; excellent draughtsman, surveying, levelling, book-keeping, general office routine; highest testimonials; low salary.—Box 5045, Builders' Journal Office.

AN experienced young architect, with small connection, desires position or work at own office; prolific designer and rapid draughtsman; specifications, etc.—"C.," 24, Hainthorpe Road, West Norwood, S.E. 5026

AN Architect's Assistant desires re-engagement; town or country; neat and quick draughtsman; thoroughly capable; moderate salary.—M. P., 358, New Cross Road, S.E.

APPOINTMENT as Improver (19), just completed three years' articles with architect; good draughtsman, tracer, etc.; excellent testimonials; moderate salary.—J.S.C., 10, Almeric Road, Clapham Common. 4993

ARCHITECT'S Assistant desires re-engagement in a good London office; eight years' experience; good references; experience in competition work.—B. E. Atkinson, jun., 14, Rosslyn Hill, Hampstead, N.W. 5018

ARCHITECT'S Assistant (27), good draughtsman and colourist; contract drawings, designs, details, perspectives, surveys; travelling studentship winner; specimens.—H. C. S., 65, Grove Road, Norwich. 5025

ARCHITECT'S Assistant (24), disengaged; Inter. R.I.B.A., 6½ years' varied experience, town and country; working drawings, details, and perspectives; levelling, reinforced concrete details; assist with quantities.—Riches, 35, Culverden Road, Balham, S.W. 5013

ARCHITECT'S Assistant (23), 6½ years' experience; excellent draughtsman, working drawings, details, specifications, surveying; assist with quantities; first-class references.—H.B., 23, Springfield Road, Bury St. Edmunds. 5001

ARCHITECT'S Assistant (23), student R.I.B.A. 6½ years, varied experience, working drawings, details, levelling, surveying, drainage, specifications, quantities; excellent references; town or country; salary moderate.—Bernard A. Dyer, 3, St. Peter Street, Hereford. 5085.

ARCHITECT'S Assistant (23), excellent draughtsman, desires re-engagement; six years' first-class experience; contract, detail and competition drawings, specifications, perspectives (exhibitor at Royal Academy); prizeman for architectural design; highest references; moderate terms.—F.E.T., 10, Cobham Road, Kingston-on-Thames. 5015

ARCHITECT, 32, qualified, seeks any position where his services would be available; energetic; disengaged; mod. salary.—Box 5006, Builders' Journal Office.

ARCHITECT, civil engineer (26), building, municipal, and engineering experience, desires immediate appointment; good draughtsman; quantities, surveys, levels, sewage, railway, domestic and industrial buildings; testimonials; moderate salary. —Box 5080, Builders' Journal Office.

ARCHITECT'S Assistant, engagement wanted; member Society of Architects, 11½ years first-class provincial public and domestic work; drawings, specifications, assist quantities, supervision; permanency; age 27; salary £3 3s. — Box 5081, Builders' Journal Office.

ARCHITECT'S Assistant seeks engagement; 14 years' experience; plans, details, specifications, quantities, surveying, dilapidations, and levelling; excellent references.—C. G., "Brooklyn," Leas Road, Guildford.

ARCHITECT'S Assistant disengaged, good all-round; design, construction, specification, supervision, dilapidations, surveying, etc.; excellent testimonials.—H., "Bowood," Heronsgate, Ricksmansworth, Herts.

ARCHITECT'S Assistant seeks engagement; good draughtsman; working drawings, details, surveying, levelling, and quantities; eight years' experience.—Owen, "Meadowside," New Queen Street, Chesterfield.

ARCHITECT'S Competent Assistant desires engagement; many years' practical experience; designs, details, specifications, superintendence, surveying; two guineas.—Arch, 23, Lavenham Road, Wandsworth, S.W.

ARCHITECT and Surveyor's junior assistant (22), 4½ years' experience, desires re-engagement; neat and expeditious draughtsman; working drawings, surveying and levelling.—Williams, "Brynderwen," Pontyclun, Glam.

A.R.I.B.A., disengaged shortly, London training; chief and senior assistant in leading provincial offices; expert designer, and experienced in all branches.—A. G., "Beverley," Yardley Wood Road, Moseley, Birmingham.

ARCHITECT'S Assistant (23), capable draughtsman; good constructionalist; would go on trial for permanency; town or country; temporary work 35s.—H. J. W. E., 1, St. Dunstan's Road, Hanwell, W.

ARCHITECT'S Assistant (22), desires re-engagement in London office; contract drawings, details, surveys, double scholarship holder; Stage III. Building Construction.—Smeed, 24, West Ham Lane, Stratford, E. 5050

ARCHITECT, prepares designs, working drawings, specifications, on moderate terms; assistance rendered, town or country.—Box 5,036, Builders' Journal Office.

ARCHITECT'S Junior Assistant (20), 4½ years' experience, West End and country offices; working drawings, details, perspectives, competitions, general office routine; excellent draughtsman and tracer. Highest references; salary 25s.—G. W. S., 26, Cowley Road, Ilford, Essex. 5056

AS traveller, constructional steel, or founders; good connection architects, builders; good estimating and draughtsmanship; over 22 years' experience.—W. 61, Royal Hill, Greenwich. 5077

BUILDER'S Clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N. 5037

BUILDER'S Book-keeper, 9 years' excellent reference from present employer. All books, double entry, prime costs, accounts, trading and profit and loss accounts, etc.—Box 5049, Builders' Journal Office.

BUILDER'S Assistant (30), wants position with large provincial builder, accurate surveyor and estimator; extensive experience with architects' settlement and accounts; has revised present temporary employers' routine, and obtains accurate and immediate information on all matters; gives entire satisfaction.—Malpas, Much Hadham, Herts. 5071

BUILDER'S and Contractor's Assistant (29), thirteen year's experience, all branches, including roads and sewers, asphalting, etc.; plans, specifications, quantities and accounts, shorthand, and typewriting. — Box 5069, Builders' Journal Office.

CLERK (24), requires situation in building trade; 7 years' commercial experience; 4 years' in building trade; bookkeeping, correspondence, and general routine; excellent references; moderate salary for prospects.—Box 5068, Builders' Journal Office.

CARPENTER, and French polisher wants situation, young, capable workman, good refs.; moderate wage.—C.P., 21, Redstone Road, Redhill, Surrey. 4989

CLERK of Works, disengaged, well up in all trades; levelling and surveying; best references; abstainer.—R. E., 3, Oakfield Road, Stroud Green, London, N. 5084

CONTRACTOR'S or surveyor's assistant desires situation; experienced in measuring, leveling, setting out, accounts, supervision; good references, moderate salary for permanency. Could invest small sum.—Box 5074, Builders' Journal Office.

DRAUGHTSMAN (26), home or abroad, neat, quick tracer and colourist, working drawings from rough sketches, bookkeeping and general office routine; foreign experience.—H.W., 64, Crofton Road, Camberwell, S.E. 5003

ENGINEER, mechanic, desiring change, requires permanent situation on staff, official or private; thorough all-round general experience; married.—J.G., 86, Bathurst Gardens, Willesden, N.W. 5011

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W. 4951

GENTLEMAN, with good connection amongst architects and builders with offices in Westminster, is open to undertake agency for London and district for good provincial firm.—Box 5072, Builders' Journal Office.

JUNIOR (20), 4 years' experience, good draughtsman, quick and accurate leveller and surveyor, building, sewerage, water supply, abstracting, billing quantities, typewriting, shorthand; salary no object.—S.F.H., 16, Dodington, Whitchurch, Salop. 5032

JUNIOR Assistant, disengaged; good knowledge of domestic architecture.—Reply, J. R. F., 248, Sandycombe Road, Kew Gardens, S.W. 5031

MASONRY, manager or foreman, machinery and all details, all classes of masonry work; London and country experience; terms moderate.—G.B., 38, Napier Road, Tottenham, London. 4975

FRENCHMAN, Architectural Draughtsman, having an office at Rouen (France) is willing to accept representation of English articles used in building.—Write Ledien, 39, Petherton Road, Highbury, London, N.

SHOP-FITTING, or high-class joinery, advertiser (38), seeks situation as foreman in shop-fitting or high-class joinery works; can take full control; 9 years' references; abstainer.—Box No. 5007, Builders' Journal Office.

SIGNWRITER, Grainer and Decorator, good; fill up time, Paint, Paper; 10 years' reference; permanency, or estate; can take charge.—B.B., 58, Moffatt Road Thornton Heath. 5070

TYPEWRITING, tracing, shorthand, good class work, requiring intelligence and accuracy, can be undertaken in spare time by architect's clerk.—Address, "Typist," 2, Marsham Street, Westminster. 5043

YOUTH wants situation, surveyor's or builder's office; four years' experience; working up quantities, measuring up, good draughtsman; scholarship holder; excellent testimonial.—J. R. O., 233, Essex Road, N. 5017

Appointments Vacant.

CLERK wanted (junior), knowledge of building trade; quick, and good education; salary 10s.—Apply, Architects' Technical Bureau, 24, Hart Street, Bloomsbury. 5079

WANTED.—Two smart young men for travelling Lancashire and Yorkshire, to sell high-class, widely advertised specialities used in the building trade. Knowledge of and connection in, the Varnish and Enamel trade a desideratum, but not absolutely necessary. Good opening for really live travellers.—Apply Box 5058, Builders Journal Office.

Businesses for Sale.

BUSINESS for sale, North London builder and decorator, large jobbing trade, turnover averages £3,000 per annum; price £400, including large plant, horse and van, trucks, compact premises; large yard, workshops, stabling; illness cause of selling. — Write, Frank Edwards, 43, Moorgate Street, City. 5054

PICTURE Framing, artists' colourman, decorating, jobbing, and undertaking business for sale, in important Surrey town. Only £180 is asked for an old-established business which, under energetic management, would provide a good income. Fire connection. Spacious premises with excellent double-fronted shop; splendid position; low rent.—Agent, Reginald C. S. Evennett, F.A.I., Farnham, Surrey, and at Haslemere and Hindhead. 5075

Competitions Open.

TO ARCHITECTS PREPARING COMPETITIVE DESIGNS.

SCHEMES FOR ENGINEERING WORK, with approximate Estimates, furnished free of charge by Strode and Co., Lighting, Heating, and Ventilating Engineers, 48, Osnaburgh Street, London.

June 9, 1909. Volume 29. No. 748.

THE BUILDERS' JOURNAL

AND ARCHITECTURAL ENGINEER.

This issue contains Articles on Fire-resisting Construction and Fire Prevention.

Caxton House, Westminster.

CONTENTS.

Leaders: The Middlesbrough Competition—The Union of Hearts—The Sweet Uses of Adversity and Whitewash, 535; Architect and Corporation—London's Healthy Dwellings 536
R.I.B.A.—Results of the Council Elections - 536
The A.A. Sports - - - - - - - - 536
Middlesbrough Public Library Competition - 537
Competition Conditions - - - - - - 540
Correspondence: — Middlesbrough Public Library Competition. "Practical Building Construction" - - - - - - - 540
The Land Tax and the Building Industry - 540
Obituary - - - - - - - - - 542
Notes on Competitions - - - - - 542
Our Plate - - - - - - - - 542
Societies' Reports - - - - - - - 542
Reinforced Concrete Construction: Design, Quantities, and Practice. By Moritz Kahn 543
Building Materials and their Fire-resisting Properties - - - - - - - - - - 544
A New Fire-resisting Post Office Building - 545
Proposed New Works - - - - - - 547
The Concrete Institute.—Mr. H. K. G. Bamber, F.C.S., on "The Setting of Portland Cement" - - - - - - - - - 547
Fire Prevention Notes - - - - - - 549
The Dangers of Breeze Concrete. By D. R. Butler, Assoc.M.Inst.C.E., F.C.S. - - - 550
Tenders - - - - - - - - - vi., viii.
Complete List of Contracts - -xxiii., xxiv., xxvii.

ILLUSTRATIONS.

Centre Plate: House for Mr. C. J. Heffer, Sutton, Surrey (1st floor plan on page 542),—"Hillridge," Sutton, Surrey. H. D. Searles-Wood, F.R.I.B.A., architect - - - -
Middlesbrough Public Library Competition:—
  First-premiated design, by Russell and Cooper - - - - 537, 538
  Second-premiated design, by G. H. Wenyon and Chas. H. Potter, joint architects - 539
  Third-premiated design, by Cooper and Slater 541
A New Fire-resisting Post Office Building.—
  Fig. 1, General view of Building before the Erection of the Facade - - - - - - 545
  Fig. 2, View of Large Public Hall - - 546
  Fig. 3, Detail of Watching Balcony - - 547
  Fig. 4, Side Elevation - - - - - - 545
  Ground Plan - - - - - - - - 546
The New American Fire Escape - - - 554

The Middlesbrough Competition.

The feeling of chagrin among the unsuccessful competitors in any architectural competition is doubtless very natural, more especially at a time like the present, when the building trade is in a depressed condition and commissions are scarce. It is essential, therefore, that the feelings of the unsuccessful competitors shall not be rendered more acute by any suspicion that they have been unfairly handicapped. It is our uncongenial duty, however, to chronicle yet another competition, that for the Middlesbrough new Public Library, in which the award has caused much soreness, and is to be made the subject of an organised protest. There is no imputation of *mala-fides* in the matter. The Assessor is a very talented and highly skilled architect, with a wide knowledge of the planning of libraries and other public buildings, and there is no question that the design selected by him is the best submitted; but it is the contention of the unsuccessful competitors that this design ignores the conditions in several vital and important particulars, and that only by ignoring the conditions on these governing points was it possible to produce such a good and workable plan. In the drawing up of the conditions the Assessor had no part; and we understand that he was only appointed after the designs were sent in. The difficulty that has to be faced is one in the ethics of assessing. Should an Assessor select the best of the designs submitted to him, or should he select the best design conforming to the conditions laid down, presuming that the conditions are unsatisfactory—as, indeed, they were in the present instance? We have stated more than once that the heroic course, where such problems confront him, is for the Assessor to resign; but as this step might nullify the whole competition, the next best thing is for him to select a design that conforms to the conditions, to register in his report his strong disapproval of the conditions, and to name the design that he considers the most successful of all those submitted. The initial difficulty lies, of course, in the drawing up of conditions in an unskilful manner, and it is incredible to us that if public bodies consider it necessary to employ skilled advice in the selection of designs, they do not find it equally necessary to avail themselves of skilled assistance in drawing up the conditions on which those designs are to be based. In the case of the Middlesbrough Library, the promoters seem to have gone far to forestall the real object of the competition. They not only laid down requirements as to the rooms required and their sizes, but dictated the positions in which the principal rooms were to be placed. Surely the aim in a competition is to discover the architect who can put together the required accommodation in the most skilful and workable manner. It has been contended by one of our contemporaries that these particular conditions were so loosely drawn that any competitor was quite justified in ignoring them. We do not agree. Conditions should never be ignored by either the Assessor or the competitors. To follow them or to ignore them as one feels inclined, simply invites chaos, and would reduce competitions to a farce. Moreover, in the Middlesbrough competition the conditions were particularly definite, and uncertain points were made clear by the supplementary answers to questions. One competing firm, who were inclined to modify the conditions in order to frame a better plan, made enquiries on this very point, and they have shown us the Town Clerk's reply, in which it is distinctly stated that the Assessor would be asked to base his award upon the conditions laid down. A protest against the award has, we understand, been signed by one hundred and two of the unsuccessful competitors, and there has been some idea of taking legal action in the matter.

The Union of the Arts.

Sir William Richmond's plea for a method of artistic training devised to bring the architect, the sculptor, and the painter into closer and more sympathetic relationship is one which should appeal to all artists; for, whilst we are unable to accept Ruskin's uncompromising assertion that architecture is decoration and sculpture and nothing else, it will be very generally admitted that carved ornamentation and coloured decoration are elements of that art. It is extremely difficult to determine to what extent architects should be required to study the sister arts of painting and sculpture before they can be regarded as masters of an art in which the science of construction rightly holds the largest share. Whilst it is true that, in past epochs of art, architects have won immortality either as painters or sculptors, and, on rare occasions, as both, yet the exigencies of modern architecture now require from the exponents of the art so large an amount of technical knowledge as to render it impossible for the architect of to-day to possess more than a comparatively slight acquaintance with the technique of the art of his confrères, the painters and sculptors. Thus, whilst nothing but good could result from a systematic course of training in which students of architecture, painting, and sculpture worked side by side, we fear that the devotees of "the Mistress Art" would be unable to afford the necessary time to enable them to develop, to their fullest extent, any inherent or acquired taste for painting and sculpture. After all, as Alfred Stevens told us long ago, there is but *one* art; and the true artist, be he painter, sculptor, or architect, will realise and frankly admit the unavoidable limitations of his knowledge of those branches of art with which, owing to want of facilities for acquiring it, he has been unable to become intimately acquainted. A general comprehension of art, and a sedulously developed taste in it, he will possess as a matter of course.

The Sweet Uses of Adversity and Whitewash.

Whitewash, scorned and contemned of the artist, has often, in the sequel, turned out to be conservative of his works. Many are the churches, for instance, in which the removal of whitewash has revealed beautiful painting but little the worse for its venerable age; while the destruction of plaster has occasionally exposed rare moulding and carving that, thanks to its incarceration, has been preserved in almost the same condition as that in which it left the hands of the mediæval masons. Thus out of evil cometh good. The vandals and Puritans whitewashed and plastered better than they knew. A recent instance is reported from Fiesole, and we rejoice to know that the rescue-work has been accomplished by an Englishwoman. Miss Emily Stephens, having heard from the Sisters of the Convent of St. Girolamo that remains of frescoes were visible in a disused chapel enclosed by farm buildings belonging to them, obtained permission to do what she could to unmask the hidden beauties of the walls. Removing the dirt and whitewash from an entire wall of the sanctuary, the lady was rewarded with the revelation of an almost entire "Pieta," comprising six figures and angels. The work is probably of the fourteenth century, and the composition is Giottesque, but the types suggest Sienese influence, and at present it is impossible to assign the work to any known artist. At any rate, the painting has been pronounced by experts to be of great beauty and interest, and the experience should make both demolishers and renovators more than ever careful to conduct their operations with delicacy and expectancy.

Architect and Corporation. Architects and builders know to their cost that bargaining with elective corporations is like building on shifting sands. The corporation of to-day will with a light heart and an easy conscience repudiate the obligations of the corporation of yesteryear; or the powers that are above corporations may suddenly step in and render a contract of non-effect, to the undoing of the professional or business man who is party to it. Something of this kind seems to have happened at Cardiff. Some seven or eight years ago, Mr. Edwin Seward, F.R.I.B.A., was, we understand, commissioned by the Cardiff Corporation to prepare plans for a municipal museum, and Mr. Seward was formally appointed architect for the work. In 1905, the Government decreed that a national museum should be erected at Cardiff, and it was decided that the designs for it should be obtained in open competition. Mr. Seward was then "quietly dropped from the scheme," without recognition of the rights naturally arising from his many years of work, and without taking any steps towards paying the large sums due to him. We gather that his claims in these respects are ignored, if not repudiated, by the City Council, and to his protest and his appeal for investigation no response has been forthcoming. The National Council, however, have repudiated his position in the matter. The only remedy that seems open to the architect who has been thus shabbily treated is to oppose the Corporation's Parliamentary Bill, and it would not be surprising to hear that, in the absence of reparation, he had decided upon taking that course. Such opposition would place the Bill in jeopardy, and would probably prove far more costly to the Corporation than a just recognition of the architect's rights. Mr. Seward's attitude throughout seems to have been marked by dignity and restraint; and as he himself remarked to a representative of the Press, ' It is an extraordinary feature of the case that all along I appear to have the goodwill of almost every member of the corporation; but events have, perhaps, ruled rather than persons.'' It is one of the little ironies of the situation that it was Mr. Seward himself who proposed that the municipal museum should be made to assume a national character. Possibly the corporation is actually without the power to compensate Mr. Seward for his labours, to say nothing of his disappointed hopes. If that is the case, it is time that the law bearing upon the responsibilities of corporations was made more equitable. The invidious position in which Mr. Seward has apparently been placed ought not to be possible in a civilised community. Such cases seem to cry aloud for the prompt and determined intervention of the R.I.B.A.

London's Healthy Dwellings. Mr. John Burns, who is surely London's most ardent lover, now appears to claim that it is a health resort of the first order. In opening, at Whitechapel on Thursday last, the exhibition that has been organised by the National Association for the Prevention of Tuberculosis, he declared that in the fight against consumption, London was more successful than other great cities of the world, mainly because of her system of small houses. London has only eight persons per house, while Berlin has seventy-seven. Finsbury, Glasgow, Berlin, Paris, and New York all proved that the one-room tenement was the haunt of disease. He was glad that London builders no longer erected houses with basement rooms, and that cellar dwellings were doomed. He realises very clearly, however, the potency of personal habits in the prevention, or the promotion, of the terrible white scourge—the great plague of great cities. An important influence, he said, was "common sense operating by immediate personal and practical means." Windows and the registers of fireplaces should be constantly open. The fetish of the workman's parlour ought to be overthrown. It should not be reserved as a museum for wax fruit, stuffed birds, and china dogs, "sacred to the landlord, the insurance man, the undertaker, and the doctor—a place where children dared not enter, and even the father was a trespasser. The parlour should be put to common daily use, increasing the space of the home by at least twenty-five per cent."—the space of the home, observe, not the space of the house. It appears, then, that, generally speaking, London sets an example in the building of healthy homes, but not all the people are careful to keep them healthy. Mr. Burns, of course, is not an original censor of the sacrosanct front parlour. Many architects have devised small dwellings in which the parlour is superseded by a real living-room. The difficulty is to keep the living-room sufficiently spic-and-span and tidy for the reception of the grandees or supermen enumerated by Mr. Burns. To keep the front parlour select is, for the very poor, the only way to prevent the carpets and furniture from getting shabby, and the wall-paper from becoming dirty. The builder of small dwellings, therefore, will be reluctant to interpret Mr. Burns's homily as applying to planning; but it will encourage the good and growing custom, in which London has taken the lead, of building healthy separate dwellings rather than big barrack-like buildings, which, the larger they are made, become the less homelike and the less healthy.

The June issue of the "Architectural Review" (Caxton House, Westminster; price 1s. net) contains, as frontispiece, a view of the Radcliffe Library, Oxford (James Gibbs, architect). Under the heading, "The Practical Exemplar of Architecture," are given views and measured drawings of an early eighteenth century staircase at Brent House, Brentford; and of a fine doorway at Bocking High Street, Essex; and there is a note on "Staircases and Doorways." Notes of the Month deal with "The Study of Architecture," "Sculpture and Painting at the Royal Academy," "St. Paul's Cathedral," "Flower Beds," and "Town Planning." Buckland House, Berks, is described by Mr. Edward Warren, F.S.A. (five illustrations). The salient features of the Selfridge Store are shown in a series of interesting views and details; and the Churchill Cottage Homes, built to the designs of Messrs. Silcock and Reay, are shown in half-a-dozen illustrations. Mr. Walter H. Godfrey contributes an interesting note on the survey of Chelsea; and the reviews of books deal with "Old Interiors in Holland," "French Châteaux and Gardens in the Sixteenth Century," "Greek Buildings Represented by Fragments in the British Museum," etc., etc.

R.I.B.A.

Result of Council Elections.

The result of the balloting for the new Council was declared at the general business meeting on Monday evening. The Council and officers for the next session, 1909-10, are as follows: —

President: *Ernest George.

Hon. Secretary: Henry T. Hare.

Vice-Presidents (4): Professor Reginald Blomfield, A.R.A., M.A., F.S.A., A. W. S. Cross, M.A., E. Guy Dawber, *James S. Gibson.

Members (18): *J. J. Burnet, A.R.S.A., Max Clarke, W. A. Forsyth, *J. Alfred Gotch, F.S.A., Alex Graham, F.S.A., †Edwin T. Hall, *George Hubbard, F.S.A., *H. V. Lanchester, *Edwin L. Lutyens, *Mervyn E. Macartney, B.A., F.S.A., C. E. Mallows, *Ernest Newton, *A. N. Prentice, *Halsey Ricardo, *John Slater, B.A., †Leonard Stokes, *Paul Waterhouse, M.A., Edmund Wimperis.

Associate Members (4): A. E. Munby, M.A., Professor C. H. Reilly, M.A., H. W. Wills, A. Needham Wilson.

Representative of the Architectural Association: Henry Tanner, jun. (president).

* Re-elected.

† Past vice-president, re-elected on the Council.

THE A.A. SPORTS.

The Architectural Association Athletic Club Sports took place on Saturday afternoon last at the Stamford Bridge Sports Grounds, in dull and gloomy weather. There was a fair muster of members of the Association and their friends, amongst those present being Sir Henry and Lady Tanner, Mr. Walter Cave (late president, who acted as referee), Messrs. Henry Tanner, jun. (president), C. Wontner Smith, F. Dare Clapham, Edwin Quin, and T. L. Dale (who acted as judges), Mr. H. P. G. Maule (starter), Messrs. F. W. Parker, Alan Potter, and R. W. Cable (time-keepers), and D. G. Driver (secretary). The following were the results: —

100 Yards.—Heat I.—H. M. Whitehead 1, H. M. Archibald 2; time 12 secs. Heat II.—L. M. Gotch 1, P. H. Wyatt 2; time 12 2-5ths secs. Heat III.—T. C. Mannooch 1, A. F. Spencer 2; time 11 4-5ths secs. Final.—H. M. Archibald 1, A. F. Spencer 2, T. C. Mannooch 3; time 11 4-5ths secs.

Putting the Weight.—J. A. Cheston (30ft. 6¼ins) 1, P. E. Holland 2, L. Burton 3.

440 Yards Handicap.—H. M. Whitehead 1 (15 yards start), B. H. B. Symons Jeune 2 (10 yards), P. H. Wyatt 3 (30 yards); time 54 4-5ths secs.

Throwing the Cricket Ball.—S. A. Cowper 1 (86 yards), H. M. Archibald 2.

Hurdles.—Heat I.—A. F. Spencer 1, S. A. Cowper 2; time 20 2-5ths secs. Heat II.—J. E. MacGregor 1, Percy May 2; time 23 secs. Final.—S. A. Cowper 1, A. F. Spencer 2, Percy May 3; time 19 3-5ths secs.

Mile Scratch Race.—F. D. Sowerby 1, P. E. Holland 2, L. M. Yetts 3; time 4 mins. 48 1-5th secs.

Half-Mile Handicap.—H. M. Gale 1, B. H. B. Symons Jeune 2, L. M. Gotch 3; time 2 mins. 19 1-5th secs.

220 Yards.—T. C. Mannooch 1, H. M. Archibald 2, H. M. Whitehead 3; time 26 1-5th secs.

Mile Handicap.—C. Grellier (100 yards start) 1, P. E. Holland (scratch) 2, A. G. Blackford 3; time 5 mins. 1 2-5ths secs.

330 Yards Handicap.—H. M. Whitehead 1, H. M. Archibald 2, P. H. Wyatt 3; time 36 1-5th secs.

Long Jump.—S. A. Cowper 1 (18ft.), J. A. Cheston 2 (16ft. 11¾ins.), L. Binton 3 (16ft. 9ins.).

Walking Race (One Mile Handicap).—L. M. Yetts 1, H. M. Gale 2, A. S. G. Butler 3; time 8 mins. 48 4-5ths secs.

High Jump.—J. A. Cheston 5ft. 1in.

Three Miles Handicap.—F. D. Sowerby (scratch) 1, L. M. Yetts (150 yards start) 2, C. Grellier (200 yards start) 3. Only four finished; the winner lapped the second and third once and the last man twice; time 15 mins. 18 3-5ths secs.

440 Yards Scratch.—T. C. Mannooch 1, H. M. Archibald 2, A. F. Spencer 3; time 58 1-5th secs.

The Squire Shield for highest aggregate points in the various events competed for by the different sections of the Athletic Club went to the Rugby Football Section, with 33 points.

The Chelsea Borough Brass Band played various selections during the afternoon, and tea was served about half-way through the programme. The prizes were afterwards presented by Lady Tanner.

MIDDLESBROUGH PUBLIC LIBRARY COMPETITION.

The principal points of the conditions of the competition may be briefly enumerated as follows:—Each design submitted was required to give an estimate of the cost for the complete structure, which was not to exceed £12,000, exclusive of furniture and fittings. The drawings were to be limited to plans of each floor and roofs, elevations and cross-sections, all to scale of 8ft. to 1in. No perspective drawings were admitted, though reports explanatory of any details were allowed to be optional.

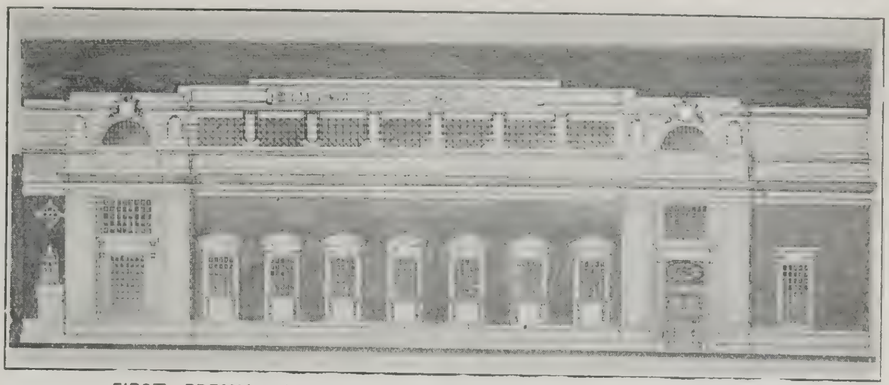
The choice of the professional assessor—Mr. J. S. Gibson, F.R.I.B.A.—was made later by the Free Library Committee, who were responsible for the framing of the conditions. Competitors now complain that several of he clauses were vague and unnecessary. n detailing the rooms required, however, he committee, instead of giving approximate uperficial areas, specified actual dimensions, t the same time explaining that small deviaons would not disqualify, a qualification of hich some of the competitors took full dvantage, whereas many others were handiapped by what ultimately proved to be a o literal reading of the conditions. The tter stipulated that the lending library hould be placed in the northern part of the lock adjoining the dwelling houses in Dunng Street. As will be seen from the plans, oth the first and second selected designs nored this condition.

Premiums of £50, £30 and £20 were offered r the designs placed respectively first, cond, and third—the premium on the scheme timately approved and accepted by the ouncil to be merged in a commission of per cent. on the actual expenditure up to e amount of the estimated cost.

The site, which is in close proximity to e Town Hall, is a rectangular corner block, ith frontages to Dunning Street and Grange oad East, and is practically level. A setck of 18ft. was to be allowed in the Grange oad East side, a projection of 3ft. being lowed for porches, bay windows, etc. The commodation required was to include on e ground floor a general lending library, out 67ft. by 39ft.; boys' and girls' reading oms, each about 31ft. 6ins. by 29ft., to be rved from the juvenile book store at a comon counter, and to be divided from each other a glazed partition running from the serce counter and provided with separate enances; a juvenile book store about 24ft. by ft.; a ladies' reading room, 22ft. 6ins. by ft.; a receiving, repairing, and catalogue om 23ft. by 10ft.; a janitor's room, about ft. by 10ft., with store, lavatory and w.c., d main entrance from general news room d access to other parts of building; a rnace, boiler and coke store, about 15ft. by ft., with direct access from janitor's room; general news room about 54ft. by 38ft. On first floor: a reference library, about 67ft. 39ft., immediately above general lending rary; a librarian's office, about 14ft. by t., with access to the reference library; law library, about 18ft. by 16ft.; a files om, also about 18ft. by 16ft.; a patents rary and extensions and lavatory and w.c.'s male and female staffs, etc., about 35ft. s. by 49ft. On the second floor (attic): a ff room, 14ft. by 16ft.; a space under gables be prepared as store rooms, and lighted m roof. The authors of the conditions to be commended for dispensing with any vision for public lavatory and w.c. acnmodation. The present writer's experie leads to the belief that such accommodan is entirely unnecessary, and when proed simply constitutes a general nuisance.

he extraordinary keenness which the comitive system has aroused was particularly istrated in this case—no fewer than 203 of drawings being submitted, for the exition of which the whole of the crypt of north block of the Town Hall was requisied.

he assessor's award (which has already



FIRST PREMIATED DESIGN. ELEVATION TO DUNNING STREET.
RUSSELL & COOPER, ARCHITECTS.

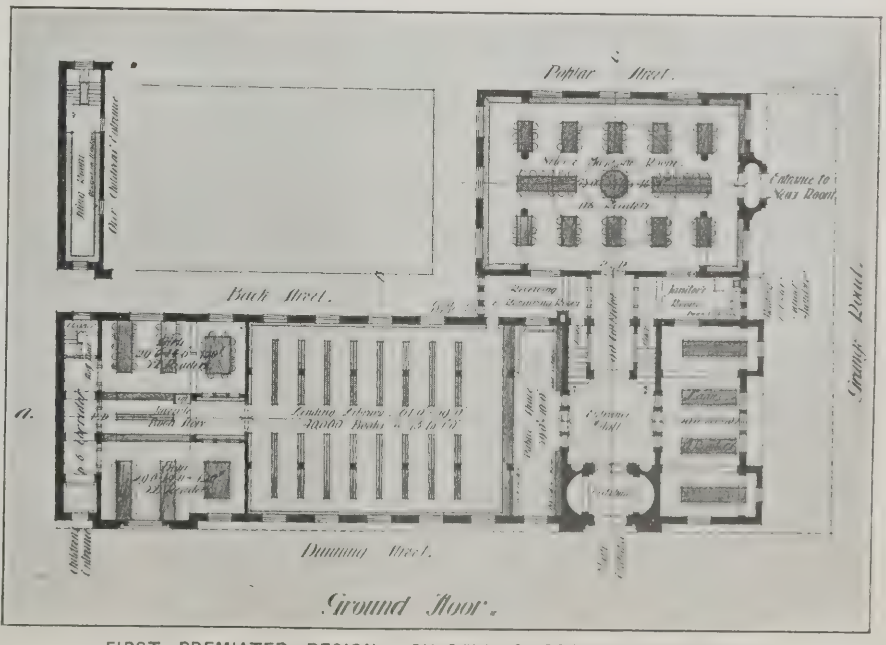
The elevations are unaffected and simple, and the fenestration is good. The bays on either side are rather high, and compete to some extent with the central mass.

been accepted by the Library Committee, and passed on to the Council for confirmation) seems to us to be, as regards the merits of the premiated designs, eminently satisfactory. The first selected design is that of Messrs. Russell and Cooper, 11, Gray's Inn Square, London, W.C.; Messrs. G. Wenyon and C. H. Potter, 194, Wolverhampton Street, Dudley, and Messrs. Cooper and Slater, 13, Richmond Terrace, Blackburn, are respectively the authors of the second and third successful designs.

Messrs. Russell and Cooper's plan is distinguished by extreme simplicity, resulting in general convenience, and the possibility of adequate supervision. Both the entrance portico and the ladies' room are of particularly pleasant shape, and the access to the latter through the main hall, on the same axis as the lending library entrance, is a very satisfactory arrangement. It will be observed that the boys' and girls' rooms are well placed with regard to the lending library; and the service of books to the juveniles from their particular store appears to us to be distinctly good, as also does the supervision, owing to the lending library being contiguous to the boys' and girls' rooms. The news room has the disadvantage of being approached by the somewhat meagre entrance from Grange Road East, and, being contained by external walls on two sides, is subject to annoying distractions from traffic outside. In the replies to queries, it was expressly stated that the only communication necessary between the news room and the other parts of the building should be through the janitor's room. Here a door, finishing the main axis of the hall, is provided; but it is generally found most satisfactory to isolate, if possible, the habitual occupants of the news room. We also cannot but feel that in supplying the room with top-light, as required by the conditions, it is rather unfortunate that this should be done by means of a dome springing suddenly from the flat surface of the ceiling, without any visible means of support.

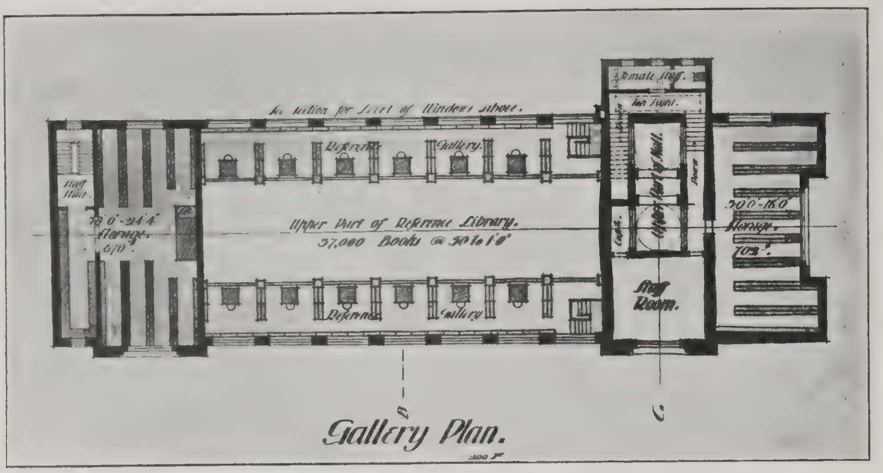
The arrangement adopted on the first floor with regard to the disposition of the reference, law, and patents libraries is much superior to that employed in some of the plans submitted, where access to the law and patents libraries can only be obtained by traversing the reference library. Although it appears to us that supervision would hardly be likely to be required for such libraries, yet it seems to have been this consideration that in certain cases led to such an arrangement. The administration rooms are fortunately placed, the back staircase giving almost direct access to the lending library from the librarian's room. The introduction of a special book-room opening off the latter is, in our opinion, a distinct advantage. With regard to the architectural treatment of the interior, we venture to suggest that in the reference library, the detail be somewhat lightened, and that the thin iron balcony and the heavy supporting columns be brought more into harmony. The desirability of this, we think, will be sufficiently clearly seen from the section. In short, the general character of the decoration would seem to warrant further consideration.

The main composition of the elevations is unaffectedly simple, and the fenestration well disposed. But we would point out that



FIRST PREMIATED DESIGN. RUSSELL & COOPER, ARCHITECTS.

This plan is distinguished by extreme simplicity, resulting in general convenience, and provides for adequate supervision. The access to the ladies' room is well arranged, and the boys' and girls' rooms are conveniently placed as regards the lending library.



FIRST PREMIATED DESIGN. RUSSELL & COOPER, ARCHITECTS.

The arrangement of the upper part of the reference library is very similar to that of the Patent Office Library in London, and provides for quiet study in the little bays, each of which can be devoted to books on one particular subject. Ample storage accommodation is also shown; and a lift for books.

the two balancing blocks in the main part, considered in themselves and in relation to the central mass, are rather unnecessarily high. In themselves they appear slightly attenuated, and in relation to the central mass they form undesirably competing features. On the side elevation, moreover, no attempt appears to have been made to bring the subsidiary mass of the news room into composition with the main building—though this, of course, would in any case be a problem of extreme difficulty.

Generally the design of the facades is a modern extension of the Georgian manner, with all the latest devices of detail; but it is nevertheless considerably above the average.

The second premiated plan, that of Messrs. G. Wenyon and C. H. Potter, though not so convenient on the whole as the first, exhibits several commendable features. It will be noted that the news room is shielded from traffic noises by the placing of the janitor's room and the store room on the outside, balancing on either side of the short entrance corridor from the main street—a very satisfactory device.

In the case of the juvenile rooms, however, the advantage derived from their having each a separate entrance seems to us to be nullified by the fact that this provision necessitates that the rooms be arranged longwise, resulting in their being of rather attenuated shape, and in consequence somewhat underlighted. The supervision throughout is excellent. In the elevation to Dunning Street we could have wished for a little more balance; and the decorative excrescences on the recessed face between the two main blocks have an appearance of crudity, whilst the windows in the latter, hanging from the architrave of the main entablature, are distinctly unfortunate.

The design of Messrs. Cooper and Slater, placed third, adheres more closely to the conditions than the other two premiated schemes, but in our opinion is not so generally convenient. In the disposition of the lending library, planned to balance the boys' and girls' rooms, the ladies' room and the receiving room, there is ingenious forethought, save for the fact that this arrangement involves an artificially lighted room. The planning of the juvenile rooms is one of the best shown, though their service counters from the book store might prove rather awkward. It will be observed that the secondary entrance asked for is here provided for the purpose of giving direct access. The news room is of good shape and well supervised, and the entrance is certainly less disturbing to the readers than that provided in many of the designs submitted.

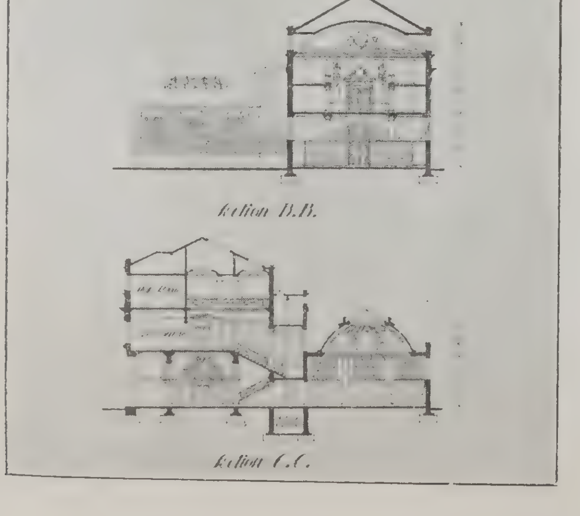
On the first floor the aforementioned symmetrical disposition of the rooms necessitates the introduction of an insufficiently lighted corridor communicating with the patents library and extension.

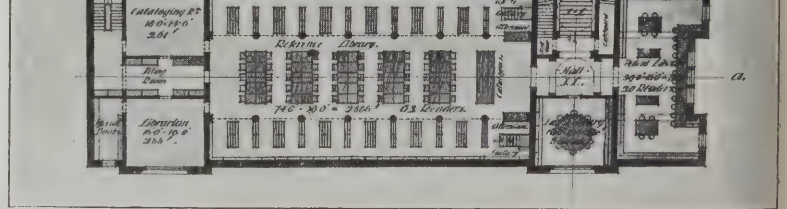
The elevations are composed with considerable success in their main lines, though we think the spacing of the windows is not quite as happy as might be desired, and in several cases the detail seems to err in the direction of over-boldness. The central tower on the Dunning Street facade is, after all, a rather needless extravagance in a public lending library, and it is pleasant to note that the tower as an indispensable feature in competition design is lessening in popularity. Still, on the whole, the design is strong and sincere, and is very well drawn.

With regard to the other plans submitted it would appear that many of the competitors had not quite realised the significance of the reply to the query as to whether the secondary entrance required from Grange Road East must give access to the lending and reference departments. In the best plans no such access is provided, and a much better arrangement is obtained in consequence. Several designs showed corner entrances—a feature which the nature of the site renders certainly inadvisable, as it inevitably results in awkward and ugly shapes, and is generally inconvenient. A number of the elevational treatments give evidence of the modern Greek movement. Messrs. Wills and Anderson, 24, Bloomsbury Square, W.C., present an exceptionally good design in this manner, successfully solving the difficult problem of obtaining a symmetrical front to Grange Road East. Mr. Harold Norton, 14, Bedford Row, W.C., has obviously expended the most careful thought on the detail of his facades. A delicately drawn set is submitted by Mr. G. Nott, 64, High Street, Leicester. Although the plan seems to us somewhat weak in parts, we would commend the simplicity and good taste with which the elevations are resolved. Messrs. Crouch and Pole, 12, Gray's Inn Square, W.C., have evolved an admirable conception in the neo-Greek style.

* * *

[We have received several communications in which complaint is made that those com-

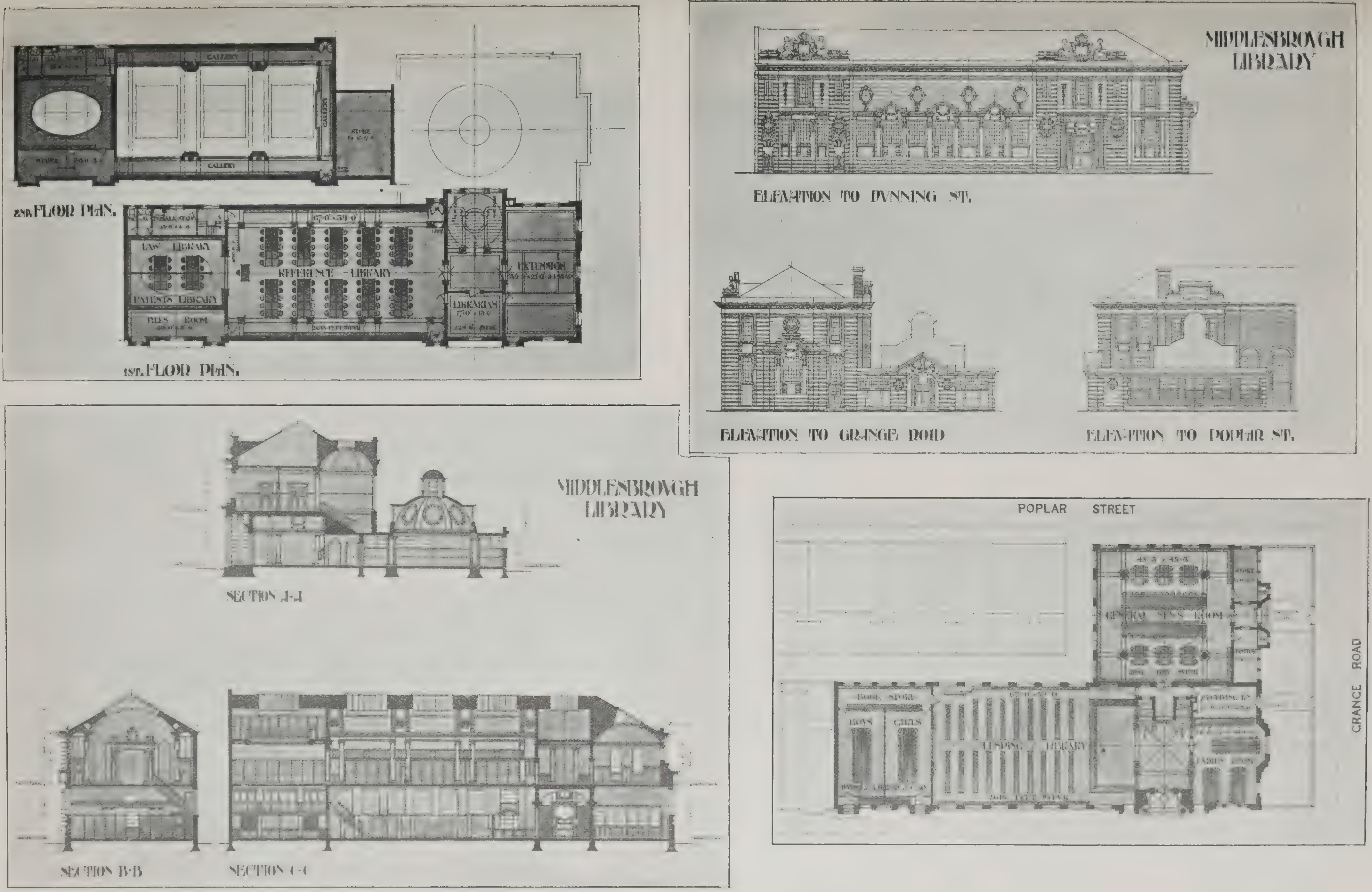




FIRST PREMIATED DESIGN. SECTIONS AND FIRST FLOOR PLAN.

RUSSELL & COOPER, ARCHITECTS.

On this floor is placed the main floor of the Reference Library, with seats and tables that can be used for periodicals; and bays for division of the books into different subjects. The arrangements here are superior to those in most of the designs. The administration rooms are well placed; the room for special books, opening out of the librarian's room, is a good feature. The interior treatment of the room might with advantage, and probably will be, further considered when the working drawings are prepared. The thin iron balcony requires bringing into harmony with the heavy supporting columns. This will be clear on reference to the sections.



SECOND PREMIATED DESIGN. G. H. WENYON AND CHARLES H. POTTER, JOINT ARCHITECTS.

The arrangements in this design for supervision are excellent It will be noted also that the news room is more shut off from the street noises by being placed behind the janitor's room and a store room. The children's rooms are separated, and have separate entrances, which is an additional advantage; but the rooms in consequence have had to be arranged lengthwise and, consequently, are not so well lighted. The elevation to Dunning Street is not so well balanced as in the winning design, but those to Grange Road and Poplar Street are better contrived.

petitors who adhered strictly to the conditions were severely handicapped as compared with those who, by modifying these conditions, were in a position to produce "an unhampered plan." In a formal protest that has been prepared for submission to the Middlesbrough Free Library Committee, the following departures from the conditions are alleged:—"(1) Lending library separated by about 35ft. from houses in Dunning Street, instead of adjoining same as laid down and confirmed (see No. 100, Replies to Queries). (2) Separate counters to boys' and girls' reading rooms instead of common counter as required. (3) Sizes of all rooms considerably varied, as, for instance, patents library and extensions, about 700 sup. ft. instead of 1,739 as required. (4) No secondary entrance in Grange Road. (5) Communication between news room and main buildings provided though expressly forbidden." This protest, we are informed, has been signed by more than a hundred competitors. It should be noted that the conditions were not drawn up by the assessor].

COMPETITION CONDITIONS.

(*Communicated.*)

Architectural competitions, in common with every other form of contest in which the prizes are few and the blanks are many, must necessarily give rise to much disappointment and disapproval, and it is natural that these emotions should yearn for expression. Consequently, almost every competition of any importance is normally followed by the bitter cries of the unsuccessful, who, in their hour of defeat, are perhaps apt to magnify trifling points that they conceive to have operated unfairly against them in the struggle. But in too many cases the grievance is only too real and palpable, as, for instance when the positions and dimensions of rooms having been definitely specified, the award is given to competitors who improve on the conditions, to the obvious disadvantage of those who faithfully adhere to them. It is impossible to withhold sympathy from those competitors who suffer from their close adhesion to the conditions. At the same time, it would be idle to ignore the difficulties of the position. The object of competitions is to secure the best building that the competitors can design. When, therefore, the design that the assessor considers to be best is found to override some of the conditions that were laid down, and the modifications are a positive improvement, it is surely by no means surprising that he should choose those designs. In truth, he must find himself in a very unenviable position. If he chooses the best design, in spite of the fact that it does not strictly conform to the conditions, the competitors who adhered to the conditions have a genuine grievance. If, on the other hand, he selects a less suitable design, which, however, fulfils the conditions to the letter, he defeats the real object of the competition. Which course he should adopt is rather a nice question in ethics. Surely the assessor could and should be spared this "divided duty." It might be avoided if the conditions were drawn up by the assessor, and were less minutely particular as to the position and dimensions of rooms, and so forth. The object being, as said before, to secure the best building, and the furtherance of that object being sought by obtaining the ideas of a multitude of counsellors, in whom is wisdom, why hamper the competitors with preconceived notions on the very points on which it is most necessary to obtain expert aid? If the employers know quite definitely what they want in the matter of planning, and are determined to have it, why hold a competition at all? Of course, if they are satisfied that they have conceived an entirely satisfactory plan, they might still require the aid of many minds and many talents in the designing of a suitable elevation; but in asking for it, there should be an explicit understanding that the plan supplied must not be modified—that there must be no deviations whatever. But this cast-iron method of procedure, although it would be fair to the competitors, who would then know exactly how they stood, would not secure such satisfactory results as must accrue if the planning also were submitted to unfettered competition, this being a matter in which, after all, there is most need of expert advice. The outcry about unfairness naturally arises when a committee make conditions that are apparently hard and fast, and do not stick to them. They should not make hard and fast conditions; it being humanly certain a strong competition will most probably yield them something that is very much better than their own conception. It would be better for all concerned—for the employers, for the assessor, and for the competitors—if the conditions were in every case drawn up by a specialist in such delicate work, who would know exactly what to bind and what to leave loose. The whole question of competitions seems to cry aloud for the most careful consideration that the R.I.B.A. can devote to it, and one would be delighted to hear that they are prepared to take it in hand in a statesmanlike spirit, with a determination to eradicate the cause of the "present discontents."

Correspondence.

[*The Editor declines responsibility for the statements made by correspondents.*]

Middlesbrough Public Library Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—In the recent Public Library competition at Middlesbrough, 202 sets of designs were submitted in response to a set of conditions containing several requirements not usually associated with library buildings of this standard. The requirements, however, were expressed in a definite manner, and they generally set down the positions of rooms and entrances in such a way that a perfect arrangement was rendered impossible. The "system" to be adopted in the lending library had not been decided upon (an all-important factor in the treatment of the plan), but competitors were instructed definitely to place this room and the reference library "*adjoining* the dwelling houses in Dunning Street." The general news room also having been located in a similar way in the rear portion of the site, the competitors by following the conditions had no alternative but to arrange the minor departments in request in the remaining awkward portion of the site allowed to them. The effect of this upon some of the queries sent in was that perfect freedom in the arrangement of the rooms was asked for, but the answers generally were that the conditions were to be strictly adhered to. The following extract is from a letter from the Town Clerk to a competitor, confirming this:—"I have to inform you that the instructions which competitors already possess are those upon which the assessor will be asked to base his award."

In any case, a feeling of confidence in arriving at a plan in strict adherence to the conditions must have been established in the minds of most of the competitors; and complete satisfaction as to the ultimate fairness of the result must have been general when the R.I.B.A. had appointed an assessor of great reputation and experience.

In the first and second premiated designs for Middlesbrough Free Library the lending library in each case does not adjoin the dwelling-houses in Dunning Street, this position being occupied by the juvenile department. Further, the heating chamber, that was particularly asked for on the ground floor (a requirement that distressed many competitors greatly, and occupied valuable space), does not appear in this position in either of the three premiated designs.

The first premiated design shows the patents library and extension measuring 39ft. by 18ft., with the staff lavatory adjoining, whereas the conditions distinctly state that this should be 35ft. 6ins. by 49ft., including the lavatories. The janitor on the second premiated design is rendered quite an unnecessary introduction, supervision easily being effected from the administration counter of the lending library.

In all probability these first and second premiated plans stood apart from the remainder in no uncertain fashion, and if these licences had been open to all in the conditions, no complaint could be offered.

Clearly the main points of the conditions have had to be set aside as regards the first two premiated designs, and it would appear that the majority of the competitors have prejudiced their chances by too closely following the conditions!

X. Y. Z.

"Practical Building Construction."

To the Editor of THE BUILDERS' JOURNAL.

SIR,—I wish to thank the gentleman who reviewed my work in one of your late issues, for pointing out such a serious error as "w.c.'s instead of sinks." I had written "sinks" clearly, and the publishers have agreed to reprint the pages affected, with the word corrected. Again thanking you.

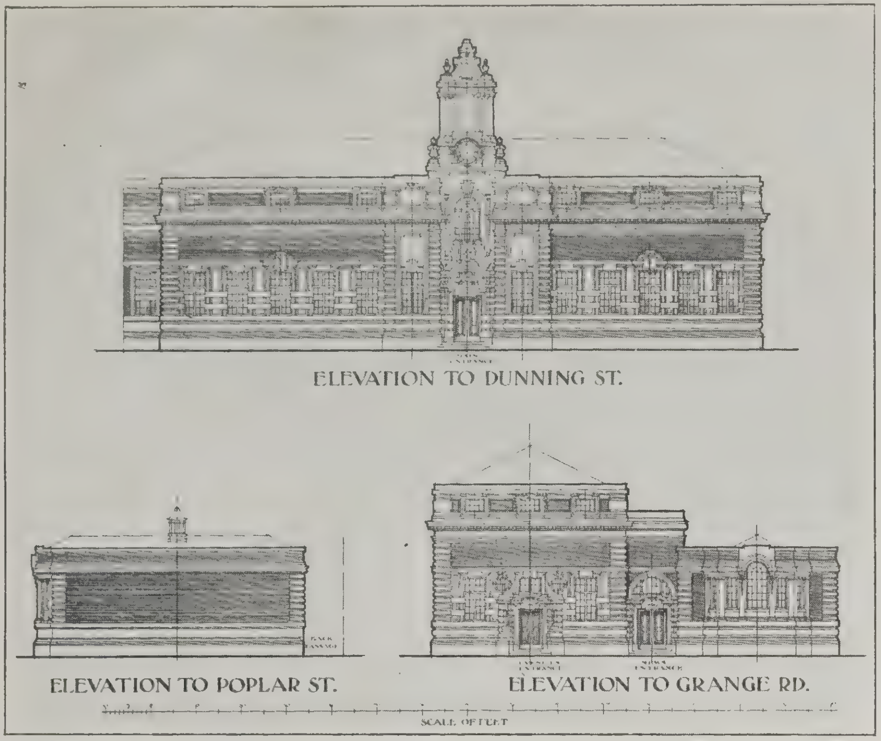
J. P. ALLEN.

THE LAND TAX AND THE BUILDING INDUSTRY.

How will the proposed land tax affect the building industry? As we have before observed, opinion on the matter appears to be sharply and almost equally divided; and, unfortunately, it is on both sides tinged with the unmistakable hues of political bias. Those who are in search of the unsophisticated truth of the matter are asking for information with respect to other countries in which the tax already exists, and towards the satisfaction of this demand there has just been issued a Parliamentary paper (Miscellaneous: No. 6 (1909), containing despatches from His Majesty's Consular Officers respecting the taxation of land values at New York, Boston, San Francisco, and Cleveland (Ohio). It is disappointing to find that they throw but very little light on the question at issue; but the following extracts will be read with interest.

It appears that, under the Tax Law of the State of New York, L.1896, each county in the State is entrusted with its own local taxation, and the assessors can divide a county into assessment districts, but no separate valuation for land and building was made prior to the year 1904. The Comptroller may sell any land for non-payment of taxes, if such tax and the interest thereon remain unpaid for a year and a month after the tax was levied. A State Board of Equalization, comprising the Commissioners of the Land Office and the three Commissioners of Taxes, meets annually for the purpose of examining and revising the valuations of real and personal properties, and there is a right of appeal against their decisions. The officers are appointed, not elected. Estimates of the rate at which land values are taxed vary considerably—from forty to ninety per cent.—but, taken all round, eighty per cent. of the actual value is assumed. The fair market price may be considered as the rule in the determination of value; but "there is no doubt that real property in the City and County of New York is not assessed at its full value." The value fixed by the assessors is disregarded in business transactions, and bankers granting mortgages on property make an independent survey. Firms of bankers, however, inform Consul-General Bennett that the valuations by the assessors come within ten or fifteen per cent. of the actual values. The entire expenses of the department charged with the work of assessment amount to about 71 dollars per million of the assessed value of real estate.

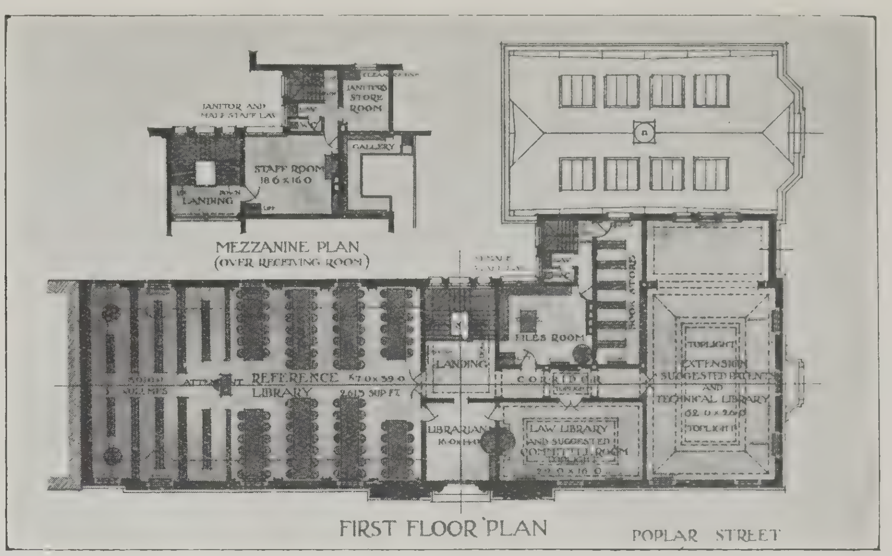
In California, there is a yearly house-to-house visitation, the assessors exacting from each person a statement under oath as to property owned. The land of delinquents is sold to the State, but may be redeemed by



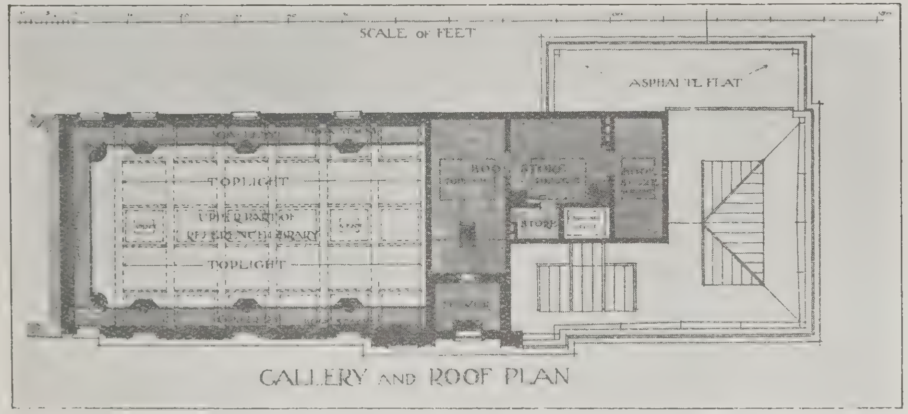
ELEVATION TO DUNNING ST.

ELEVATION TO POPLAR ST.

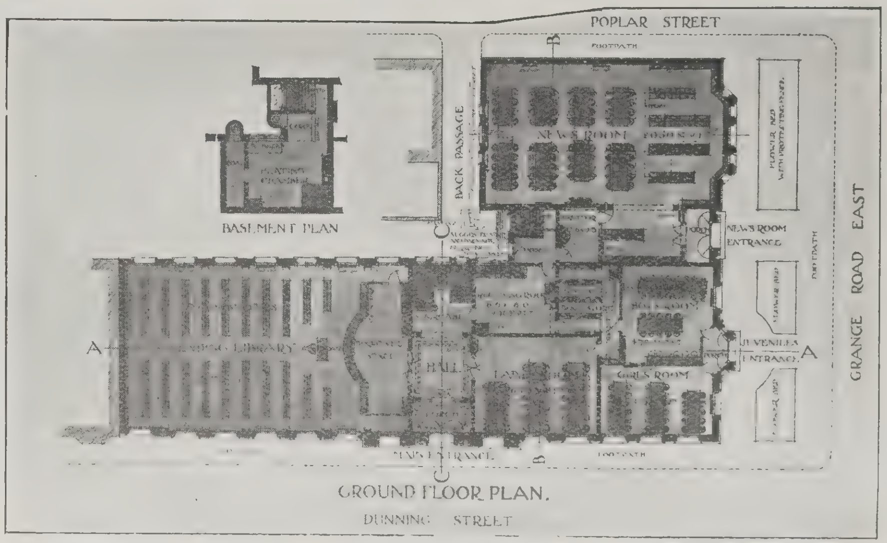
ELEVATION TO GRANGE RD.


JANITOR AND MALE STAFF LAV.
JANITORS STORE ROOM
GALLERY
STAFF ROOM 18.6 x 16.0
LANDING
MEZZANINE PLAN (OVER RECEIVING ROOM)
REFERENCE LIBRARY 67.0 x 39.0 2613 SUP. FT.
LANDING
FILES ROOM
BOOK STORE
CORRIDOR
LIBRARIAN
LAW LIBRARY AND SUGGESTED COMMITTEE ROOM
TOPLIGHT
EXTENSION SUGGESTED PATENTS AND TECHNICAL LIBRARY 32.0 x 26.0
TOPLIGHT
POPLAR STREET

FIRST FLOOR PLAN



GALLERY AND ROOF PLAN



GROUND FLOOR PLAN.

DUNNING STREET

MIDDLESBROUGH PUBLIC LIBRARY COMPETITION. THIRD PREMIATED DESIGN. COOPER AND SLATER, ARCHITECTS.

This scheme adheres more closely to the conditions than the first and second premiated designs, and in comparison suffers because of it. The arrangement of the lending library to balance the boys' and girls' rooms, the ladies' room, and and the receiving room is ingenious, and the planning of the children's rooms is perhaps the best shown. The news room is of good shape and well supervised, and the entrance is less disturbing than in many of the designs submitted. The first floor planning has been a little hampered by the symmetrical planning of the ground floor, and the corridor to the extension and patents library is, consequently, not well lighted. The main lines of the elevation are composed with considerable success, but the cupola is rather in the nature of an extravagance for a public library.

the owner within five years. The assessors are elected by popular vote.

In Boston, the full market value forms the basis of assessment, and the separate value of land has been made since 1874. Difficulty is found in following the upward and downward movements of the market. Interest at six per cent. is charged on unpaid taxes.

In Ohio, the owners are asked to report on the value of their property, and this loose system having led to great abuse, there is a movement in favour of changing the law, New York being mentioned as a model to be copied.

As to the effect of the taxes, very little that is value is said. Mr. Lawson Purdy, President of the Department Taxes and Assessments in the City of New York, writes: "The effect of the taxation of real estate in the City of New York, in so far as the tax falls on land, is undoubtedly the same as is described by John Stuart Mill, Edwin R. A. Seligman, and other writers on political economy. That is to say, that a tax on land being paid wholly by the owner, does not increase rentals, but decreases selling value. When land is sold, the tax is capitalized, the price is reduced, and the subsequent owner does not bear the burden of the tax so long as the rate does not increase. Any one familiar with New York conditions would say that the tax tends to induce a better improvement of valuable sites than would be the case if there were no such tax."

Mr. F. P. Leay, Consul-General at Boston, states that "the general effect of the tax is very difficult to estimate. It varies according to the facts considered. Undoubtedly, however, the consequences of the high tax on land and buildings *appear to have had an adverse effect on building and improvements, and thence on trades, and particularly on the establishment of industries at Boston.* It is difficult to differentiate specific effects in particular districts of the city or departments of business or enterprise, but the unfavourable influence may be said to have affected the general real estate market of late years."

Obituary.

The late Henry Dare-Bryan, F.R.I.B.A.

The funeral of the late Mr. H. Dare-Bryan, F.R.I.B.A., one of Bristol's ablest architects, took place at Westbury-on-Tryan cemetery on May 28th, and was attended by a large number of architects and builders of the city. Representing the Bristol Society of Architects, of which the deceased architect was a vice-president, were Messrs. Mowbray A. Green, F.R.I.B.A. (president), F. W. Wills, F.R.I.B.A., G. H. Oatley, F.R.I.B.A. (vice-president), W. L. Bernard, F.R.I.B.A., G. C. Lawrence, A.R.I.B.A., A. Harford, T. H. Weston, L. S. Reay, F.R.I.B.A., J. F. Wood, A.R.I.B.A., J. M. Froud, and A. R. Gough, A.R.I.B.A. The Bristol Master Builders' Association were represented by Messrs. F. N. Cowlin (president), E. I. Neale, G. Humphreys, and A. Dowling (past-presidents), and Audley Perkins. Messrs. J. Fisher, M. Park, A. Harford, and R. C. Tucket, were present on behalf of the artists and associate members of the Bristol Fine Arts Academy. Mr. Dare-Bryan's untimely death at the age of forty will be greatly regretted in Bristol and in the Architectural profession of which he was so distinguished a member.

* * *

Mr. W. Johnson, builder, of Doncaster, died there on May 29th, at the age of 73. The deceased, who was well known and one of the oldest builders in the town, never recovered from the effects of a trap accident sustained at the end of last year.

The Northampton Education Committee have appointed Mr. A. G. Lynham, of Bristol, to the post of assistant to the education surveyor. There were 588 applicants.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
June 15	BERKSHIRE COUNTY COUNCIL NEW OFFICES, COMMITTEE ROOMS, ETC., on the sites of Nos. 26, 28 and 30, The Forbury, Reading. Block plan and particulars can be obtained of J. Fred Hawkins, County Surveyor, Bank Chambers, Cross Street, Reading, Deposit £1 1s., refunded on receipt of *bona fide* design or the return within fourteen days of all particulars accompanied by letter announcing non-intention to compete. Premiums of £100, £75 and £50 for designs placed first, second, and third respectively.
July 9	STOKE-UPON TRENT. Additions to Town Hall including large hall to seat 3,000 people, police court, etc. Premiums of £100 and £50 for second and third designs respectively. Assessor nominated by Pres. R.I.B.A. Conditions and particulars from Jno. B. Ashwell, Town Clerk, Town Hall, Stoke-on-Trent,
July 17	NEW PUBLIC BUILDINGS, BURSLEM. The Architect whose design is placed first by the Assessor will be appointed to carry out the work. Premiums of £100 and £75 to authors of second and third designs, respectively, Conditions and plan of site from F. Bettany, Borough Surveyor. Deposit, £2 2s., returnable on receipt of *bona fide* design.
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	WALLASEY U.D. COUNCIL. CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

The National Library of Wales.

Professor Reginald Blomfield, A.R.A., the assessor in the above competition, has selected the design submitted by Mr. Sidney K. Greenslade, of 11, Gray's Inn Square, London, W.C. The cost of the building is estimated at £85,000.

Elland Secondary School.

Mr. Vickers Edwards, county architect for the West Riding of Yorkshire, in conjunction with Mr. A. V. Houghton, principal of the Secondary Education Department of the County Council, having delivered their report on the designs submitted in this competition, the Council has accepted that sent in by Mr. W. S. Braithwaite, of 6, South Parade, Leeds. The building is estimated to cost £12,000.

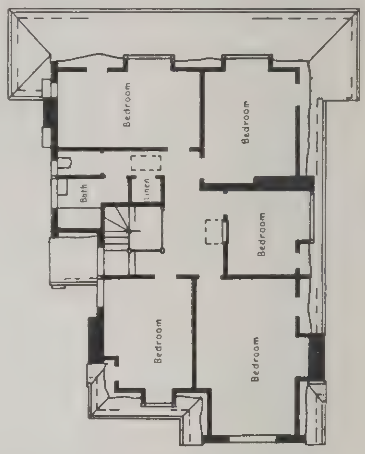
New Public Buildings, Burslem.

The Burslem Corporation has extended the time for this competition until July 17th, before which date all designs must be sent in.

Our Plate.

Two Houses at Sutton, Surrey.

We illustrate this week two houses at Sutton, Surrey, designed by Mr. H. D. Searles-Wood, F.R.I.B.A., of 157, Wool Exchange, London, E.C. That for Mr. C. J. Heffer, is built with roughcast walls with Ancaster stone dressings, and the roof is covered with dark Broseley tiles.



FIRST FLOOR PLAN, HOUSE FOR W. C. J. HEFFER, SUTTON, SURREY.

The ground floor plan and the plans of "Hillridge" are given on the centre plate.

The walls of the hall and the ceiling are panelled in oak; the windows are fitted with iron casements by the Crittall Manufacturing Co. "Hillridge," Sutton, is also built with roughcast walls, and dark Broseley tiles on the roof. The builders of both houses were Messrs. J. Huggett and Son, of Station Road, Belmont, Sutton.

Societies' Reports.

R.I.B.A.

By-law Revision.

A special general meeting of the R.I.B.A. was held on Monday, May 24th, to consider the proposals of the Council for the revision of the by-laws under the new supplemental Charter. Mr. E. T. Hall (vice-president) was in the chair, and the debate was conducted with skill and animation. Many of the proposed alterations were accepted by the general body with little or no discussion, but, following some remarks by Mr. Gammell and other Associates, a resolution in favour of increasing the number of Associate members of the Council from four (the number recommended by the Council) to six, was carried by a large majority. Some very important suggested changes with regard to other by-laws still remained to be discussed, for which purpose a general meeting was held at 8 o'clock on Monday evening, June 7th.

Junior members may be reminded that Associates, although not allowed to vote on questions relative to by-laws, are entitled to take part in any discussion following a resolution brought forward by a Fellow of the R.I.B.A. The success which attended Mr. Gammell's plea on behalf of a larger representation on the Council of the junior members of the Institute should encourage Associates to attend and speak at the business meetings, with the view of obtaining the support of their elders in respect to the removal of any legitimate grievance to which they desire to call attention.

The alleged indifference of the Council to the recommendations of the various standing Committees was brought to the notice of the meeting by a member, who thought it probably due to the fact that the members of Council were frequently out of touch with the work of the committees. He desired as a remedy that the committees should have the power to elect one of their number to the Council, by which means a sympathetic spokesman would be forthcoming when the committee's recommendations were under consideration. This proposal did not commend itself to the majority.

We understand that Mr. George Hubbard (F.) gave notice of his intention to move two resolutions having reference to the issue of a circular letter to the electorate (enclosed in the envelope containing the voting papers), presumably without the knowledge or consent of the Council. Arising out of these resolutions the recent action of the Council in censuring two of its members also came up for discussion.

On a point concerning the re-instatement of a member or Licentiate—after previous suspension or expulsion from the Institute, a member objected that the by-laws (No. 25 and 26), did not ensure that the announcement of reinstatement would appear in the same number of newspapers as that of the suspension or expulsion, and that hardship might result in consequence. The deletion of the words "if they so decide" from the latter part of by-law 25 was resolved upon by the meeting, and the objection thus overcome.

The Gloucestershire Architectural Association.

A meeting was held in Gloucester on Thursday week, the president (Mr. H. W. Chatters) being in the chair. Others present included Messrs. M. H. Medland, E. A. Pryer, G. P. Milnes, S. H. Healing, J. F. Trew, A. H. Smithson, T. Malvern, W. E. James, H. S. Davis, W. J. Knight, and T. Overbury (hon. secretary). Mr. S. A. Brooks was elected an associate. A paper was read by Mr. W. J. Bache (Cheltenham Electrical Engineer) entitled "Modern Electric Lighting." The lecturer first traced the development of artificial illumination from the rush light of early mediæval days down to the present time, and then explained the advantages and disadvantages of the various forms of electric lighting now in vogue, illustrating his remarks by means of lantern slides and actual examples. For the latter purpose the room was specially wired, a portion being in surface flexible wiring, so largely adopted on the Continent, while the new Siemens system of exposed wiring was also shown in use. The current was then switched on to numerous lamps, many of the most recent type, one 600-candle power Mercury vapour lamp producing some startling effects.—On the proposition of Mr. G. P. Milnes, seconded by Mr. M. H. Medland, a vote of thanks was accorded to Mr. Bache for his interesting and useful paper and experiments.

Junior Institution of Engineers.

At a recent meeting of the Junior Institution of Engineers, the chairman, Mr. Frank R. Durham, Assoc.M.Inst.C.E., presiding, a paper on "The Construction of Coin-freed Mechanisms as applied to Gas Meters," was read by Mr. T. S. F. Gibson, A.M.Inst.C.E., member of the Institution, superintendent of the Old Kent Road works of the South Metropolitan Gas Company. The origin and effects of the applications of coin-freed mechanisms were first briefly reviewed, and, as showing the prolific industry of inventors on the subjects, the author incidentally mentioned that no fewer than 320 patents had been registered previously to 1907. Read in sequence, these documents revealed the nature of the troubles met with as the use of the apparatus had developed. The essentials of a good machine were shown to be simplicity, strength, accuracy, and compactness, and features in its design and construction were pointed out as applicable to meters of both the wet and dry types. The author dwelt upon the necessity of guarding against fraud, and proceeded to describe in detail the various coin-freed mechanisms employed by gas undertakings, in illustration of which a fine collection of examples which had been lent by Mr. Charles Carpenter, M.Inst.C.E., chairman of the South Metropolitan Gas Company, was exhibited and their construction explained. A discussion followed the reading of the paper, in which Messrs. Walter Fendick, C. G. Evans, W. Ballantyne, N. S. Trustrum, C. H. Smith, A. W. Marshall, Sidney V. Cooke, and J. Wylie Nisbet, took part.

Manchester Society of Architects.

In the "Programme of Summer Visits and Scheme of Prize Competitions, 1909," that has been issued by the Manchester Society of Architects (Mr. J. H. Somerset, hon. sec. of Education Committee; Mr. J. Theo. Halliday, hon. sec. for summer visiting, 16, St. Mary's Parsonage, Manchester), the following coming events are included:—Tuesday evening, June 8th, Refuge Assurance Building, Oxford Street, extension (Mr. Paul Waterhouse, M.A., architect); Saturday, June 12th, the Old Hall, Nether Alderley, the church, Alderley; and the stalls at St. Philip's; Saturday, June 26th, St. Mary's Church, Astbury (leader, Mr. Isaac Taylor; Saturday, July 10th, "Heathcote," Ilkley (M. E. L. Lutyens, architect), and Bolton Abbey (leader, Mr. J. H. Sellers); Tuesday evening, July 13th, Cwen's College (Messrs. Beaumont, Capper, and Grant, architects); Saturday, July 31st, to Monday, August 2nd, Ludlow, St. Lawrence's Church, the Castle, Stokesay Castle, and Much Wenlock Priory; Saturday, August 14th, "Tirley Court," Cheshire (Mr. C. E. Mallows, architect; leader, Mr. F. P. Oakley); Tuesday evening, August 17th, Middleton schools (Messrs. Wood and Sellers, architects), fountain in park, new roof, etc., at St. Leonard's Church (Mr. Edgar Wood, architect); Saturday, September 4th, Liverpool Cathedral (Mr. G. G. Scott, architect); Tuesday, September 7th, Y.M.C.A. premises, Peter Street (Messrs. Woodhouse, Corbett and Dean, architects).

The Carpenters' Company.

The following prizes were awarded by the judges, for the competitions in connection with the lectures recently delivered on the Arts connected with Building, at Carpenters' Hall:—

1. A design for a simple building, to accommodate 200 people.—2nd prize, two guineas, Kershaw Peters; 3rd prize, one guinea, Rupert Midworth.

2. "Woodwork."—2nd prize, two guineas, F. J. Bradbeer; 3rd prize, one guinea, J. R. Shackleton.

3. Design for a dining room.—1st prize, four guineas, F. H. Luhmann; 2nd prize, two guineas, R. H. Flint.

The foregoing competitions were open to craftsmen only.

5. Design for a lounge hall.—Prize, four guineas, George Eldridge; extra prize, two guineas, Wm. Park; extra prize, one guinea, Paul Faraday.

6. Essay, with sketches, on timber built houses of the 16th and 16th centuries.—Prize, four guineas, Elfric H. Smith; extra prize, three guineas, W. Gandy; extra prize, two guineas, H. J. Chetwood.

These two competitions were open to all.

Leeds and Yorkshire Architectural Society.

The Green Book of the thirty-third and thirty-fourth sessions (1908-1909) of the Leeds and Yorkshire Architectural Society contains a full list of members (165), an account of the transactions of the Society for the twelvemonth to which it applies, the address of the President (Mr. Percy Robinson, F.R.I.B.A., whose portrait forms the frontispiece to the volume), the report of the Council, and the articles of association.

There having been persistent rumours to the effect that the Stanmore Estates (advertised for sale by auction at the Mart on June 14th, at the upset price of £275,000) have been sold, Messrs. Hampton and Sons, the auctioners, authorise us to state that such is not the case, and, furthermore, that the executors and trustees have decided that they will not sell under any circumstances previous to the auction.

REINFORCED CONCRETE CONSTRUCTION: DESIGN. QUANTITIES AND PRACTICE.

By Moritz Kahn.

Short abstract of a paper read at a general meeting of the Quantity Surveyors' Association.

(*Concluded from page* 461, *No.* 744.)

Reinforced concrete is economical when compared with other methods of fireproof construction, but the mistake should not be made that it is cheap. It is well known that the cost of materials and labour in different parts of the country vary to some degree, but it has been the lecturer's experience that in spite of the varying rates of wages and costs of material, the variations frequently offset each other, so that the unit cost obtained in any one place may, generally speaking, be used for any other locality. There are, of course, exceptions to every rule, and in certain instances careful investigations should be made of special conditions, as the result of which one must use his judgment in either increasing or decreasing the unit rates by certain percentages.

Actual Costs.

For general guidance the following figures of costs are given. They have been taken from actual constructions, and include a nett profit of about 10 per cent. to the contractor.

Cost of Complete Fireproof Buildings.

Kind of Building.	Cost of job.	Unit cost. Per cub. ft.	Unit cost. Per sq. ft.	
	£	d.	s.	d.
Offices and Stores ...	36,239	6¾	8	0
Factory	2,555	5¾	7	0
Factory	7,966	6¼	6	6
Garage	2,078	4¼	5	0
Fire Station ..	1,352	7¼	9	0
Store House ..	28,351	4¼	4	6
Cold Storage Building	40,010	6.	5	0
Highest		7¼	9	0
Lowest		4¼	4	6
Average		5¾	6	5

Taken from an average of nine Constructions.

Unit Costs of Concrete per Cubic Foot.

	s.	d.
For footings and mass concrete ...	0	10
Walls below ground	1	0
Walls above ground level	1	2½
Columns	1	2½
Beams and girders	1	5
Flat slabs	1	3
Slabs between steel beams	1	1½

Unit Costs of Centering per Yard Super.

Taken from an average of nine Constructions.

	s.	d.
For footings and mass concrete ...	1	6
Walls below ground level	2	6
Walls above ground level	3	6
Columns	4	0
Beams and girders	4	6
Flat slabs	2	6
Slabs between steel beams	1	9

Special Requirements.

The pricing of belt courses, cornices, mouldings, and surfaces requiring special treatment, presents some difficulty. It is obvious that these will depend entirely upon the individual requirements of each detail, a question of judgment for the estimator, and therefore no definite prices can be given which can be depended upon.

The subject of the pricing of reinforced concrete work is a large one, and naturally cannot be dealt with in detail in a paper of this length. Only broad principles have been touched on, but enough it is hoped to enable some general idea of the lines on which it is advisable to proceed.

Discussion.

The Chairman (Mr. Arnold E. Harris, J.P., F.S.I.) having invited discussion, Mr. H. T. A. Chidgey proposed a vote of thanks to Mr. Kahn. He thought some of the prices quoted by the lecturer were rather high. For buildings which have to carry heavy loads, and in which appearance is not perhaps a very great desideratum, reinforced concrete unquestionably is the material to be used.

Mr. A. J. Gate, F.S.I., in seconding the vote of thanks, said that practically the whole responsibility for the safety of a building may be said almost to rest on the quantity surveyor of to-day, and now he must turn to a study of concrete construction, and until he does study it he will not be able to tell our architects whether their drawings are right.

Mr. A. T. Babbs (of Cape Town) said that reinforced concrete in South Africa has a very, very uphill battle to fight. There is no Portland cement made in the country, and in many large districts there is hardly any sand that can be relied upon, while the rough labour that is necessary to use concrete is also very undependable. Then, again, the cost of centering is very heavy indeed, as all the timber has to be imported 6,000 miles. Large buildings have been put up in Johannesburg and Cape Town on the American steel frame system at great saving in cost, and they have stood the tests that have been imposed upon them. The oldest building of which he had any record was one constructed in England in 1837, which is therefore 72 years old.

Mr. Addiscott said that he did not agree with Mr. Kahn as to his methods of measurement. He considered that in taking out quantities of reinforced concrete, as in quantities of any other work, there is only one system of measuring, and that is strictly net. In his opinion, openings should be deducted and the labour entailed in their formation should be measured. Centering intersections should be taken net. He asked whether anything was known about the demolition of concrete buildings. Any ordinary building tends to become out of date in anything between 50 or 100 years, and at the present time you can get a building pulled down and the site cleared practically free of cost. But with reinforced concrete buildings, pulling down would be an expensive item, and the credit for all materials would be practically nil. Another point, also bearing on that is its availability for alterations, because even in a comparatively new building, alterations are necessary in a short time, and it seems to him considerably difficult.

Mr. Watson said that not long since an Italian professor, an antiquarian, called attention to some slabs which he had discovered at the Caracalla baths. There he found in the frigidarum in the roof some slabs with bronze rods interlacing. These must surely be one of the earliest examples of ferro-concrete, as they are certainly many hundreds of years old.

Several other speakers having addressed the meeting, and the vote of thanks having been carried unanimously, Mr. Kahn in reply said that with particular reference to remarks by Mr. Addiscott, it is very difficult for the reinforced concrete contractor to price, because he has not yet had sufficient experience to detail his cost sheets. It must be remembered that you deduct openings in brickwork because you are saving material, but when you have an opening in reinforced concrete you have to work the shutter above that to support the shutter below. As to demolition, he would rather put up a reinforced concrete building than take it down. In the Baltimore fire there was an instance where one building went through all right, but they started to take it down, and three contractors went smash during the operations. In that way, we build better than we know. When we build, we do not want the building to come down, and he (Mr. Kahn) certainly did not want to be around when it was being taken down. Regarding alterations, there is no difficulty about effecting these in reinforced concrete or structural steelwork. Having built a floor slab, say, of 16ft. span and 16ft. square, if in two months you say, "I want a lift-hole through there," the speaker would not hesitate to cut out a hole 8ft. square.

Mr. Richard Parsons, of Settle, Yorks, has been offered and has accepted the position of superintendent of the rebuilding operations at Messina. Over a hundred churches and eight hundred bungalows are, it is stated, to be built.

BUILDING MATERIALS AND THEIR FIRE-RESISTING PROPERTIES.

The technologic branch of the U.S. Geological Survey has recently made a number of tests of building materials at the laboratories of the National Board of Fire Underwriters at Chicago. The materials were subjected to higher temperatures than would probably be reached in an ordinary fire and when withdrawn from the furnace were quenched with water. The tests were made under the direction of Mr. Richard L. Humphrey, who, in a report on them, points out that the results are inconclusive and should be regarded merely as preliminary data and not as final proof of the relative resistance to fire of the materials tested.

Much of the damage done to the materials in this series of tests was caused by internal stresses, the gas flame of the furnace heating one face of the test pieces much more rapidly than the other. All the materials tested, including the hydraulic pressed brick, cracked more or less. The concrete cracked least, but the tests indicate the necessity for using metal reinforcement in concrete walls to distribute the effect of the expansion.

Concrete and Mortar Panels.

The fact brought out most clearly by the tests, according to Mr. Humphrey, is the low rate of heat transmission of Portland cement concretes and mortars. This is one of the desirable qualities in buildings intended for fireproofing purposes. For marking the cement blocks linen tags were fastened by wire nails to the interior walls at the time of moulding. Most of these tags remained in place during the test and when the walls were demolished the tags in every case were found entirely undamaged.

An average of all the tests shows that about 90 per cent. of the maximum temperatures attained by the faces of the panels were reached in one hour, while in the case of the mortar blocks the increase in temperature of the backs of the panels in one hour was only about 20 per cent. of the total increase in the two hours. Of the solid concrete panels the cinder concrete showed the smallest increase in the temperatures at the backs of the walls and the granite concrete the largest. The total increase in the temperatures of the mortar panels was about the same as the total increase in the temperatures of the backs of the concrete, but the increase in one hour was somewhat greater in the case of concrete.

The report states that the damage done to the faces of the mortar and concrete panels would probably be caused at a temperature about half that of the maximum temperatures reached, owing to the water of crystallization being driven from the mortar. This thin layer of dehydrated mortar may have formed a protective coating and prevented dehydration.

Concrete Blocks.

The concrete behaved remarkably well and it was difficult to determine whether the limestone, granite, gravel, or cinder concrete sustained the least damage. The faces of all the panels were more or less pitted by the fire and washed away by the stream of water. The test was unfair to the cinder concrete, as the cinder was very poor, containing a large percentage of unburned coal; however, the sample selected was the best of six or eight investigated in St. Louis. During the fire test the coal ignited and left the surface of the concrete very rough, and badly pitted. The limestone aggregate in the face calcined and the granite aggregate split and broke away from the surface mortar. The granite concrete probably behaved better than any of the above-mentioned concretes. Damage in no case extended deeply, probably not more than 1½ins. The evidence shows that even at this depth the temperature was comparatively low. The high stresses produced in the panels by the rapid rise of the temperature of the faces, while the backs remained cool, caused cracks. On taking down the panels the blocks of concrete were found to be cracked vertically for some distance from the face. The serious damage done the various natural building stones precludes any comparison among them.

Hollow Concrete Blocks.

The strength of the webs of ordinary hollow concrete blocks is stated to have been insufficient to resist the stresses set up in these tests, as in many cases the rapid rise in temperature and the subsequent quenching of one of the faces of the blocks caused the webs to split. It was noticeable that the richer the mortars used in these blocks the better they withstood the tests. The amount of water used in mixing the mortars had a similar effect on the fire-resistive qualities; the mortars mixed with the greatest percentage of water gave the best results.

When the blocks were cracked or spalled before the application of water the damage appeared to be greater in the dry mixtures containing the greatest percentage of sand, and it was further observed during the fire test that the richer mixtures warmed up more slowly than the others.

It is apparent that one of the causes of weakness in the cement hollow building blocks under these fire tests was the weakness of the concrete, a too dry and lean mixture, which, coupled with the thinness of the webs, provided insufficient strength to resist the stress due to the rapid expansion of the face. The report states that it is quite possible, as was shown in some of the block tests, to make blocks which will pass the conditions perfectly; the web must be thick enough to give the necessary strength.

Brick and Tile Panels.

The brick panels are considered by Mr. Humphrey to have withstood the tests better than the other materials. The common brick tested comprised unused new Chicago brick and used St. Louis brick. Fifty per cent. of the new bricks were split, while sixty to seventy per cent. of the old bricks were not damaged. Lime knots seemed to be responsible for most of the damage to the new bricks, as they were found at the bottom of nearly all the cracks. The bricks at the back of the panels were entirely unaffected. While the strength tests are not conclusive, there is apparently little difference in the strength of the bricks before and after firing.

The hydraulic-pressed brick withstood the test very well. No damage was apparent after the firing and before the water was applied, and although a number of the bricks cracked, 70 per cent. of them were found to be sound after quenching.

The sand-lime brick did not withstand the test as well as expected, but the sample tested, which was purchased at random, appeared to be somewhat below average quality.

The backs of the brick panels also showed a small increase in temperature, but the natural building stones and tiles proved poorer non-conductors of heat.

The tile tested was bought in the open market and one panel was taken from a lot of material about to be erected in a building. A large percentage of the faces of the tiles was washed away by the water and the material composing the faces became soft and could easily be crumbled in the fingers. There was a comparatively rapid rise in the temperature of the backs of the panels. The plaster on the partition panel tile fell off a few minutes after the test was started.

Members of the Building Trades Exchange of the City and District of Edinburgh, have visited Whitehill Brick Works, Rosewell, where they were received by the manager, Mr. James Hamilton. They were shown over the whole of the works, and saw the whole process of making fireclay and composition bricks, tiles, drain pipes, etc. One machine turns out 20,000 bricks in an ordinary working day.

A NEW FIRE-RESISTING POST OFFICE BUILDING.

The new Western District Post Office building, situated in Wimpole Street, Cavendish Square, W., is of considerable magnitude, having a frontage to Wimpole Street of about 160ft., and a depth of more than 200ft. It is constructed from the basement to the roof in reinforced concrete, the work being designed in His Majesty's Office of Works, and the plan has been kindly lent by the chief architect, Sir Henry Tanner, I.S.O. The building has been in the charge of Mr. J. Wager, A.R.I.B.A., of H.M. Office of Works.

Time was when Government departments were notoriously slow to adopt up-to-date methods; but here we have one of many gratifying indications that the old reproach of sluggishness no longer holds good—that a new and more enterprising spirit now prevails. Of all buildings, a post office should be rendered as completely as possible fire-resisting; and to this self-evident proposition Sir Henry Tanner has, in many other instances, as well as in the present case, given practical effect by the adoption of thoroughly up-to-date methods of construction. In taking this course, he has set an example that is sure to be widely followed, so that his choice is valuable not only in itself, but by its influence on general practice.

The erection of this structure in reinforced concrete by this Government Department furnishes, in fact, a further proof of the economical, space-saving, and fire-resisting qualities of armoured concrete. One of the most remarkable features of this structure is

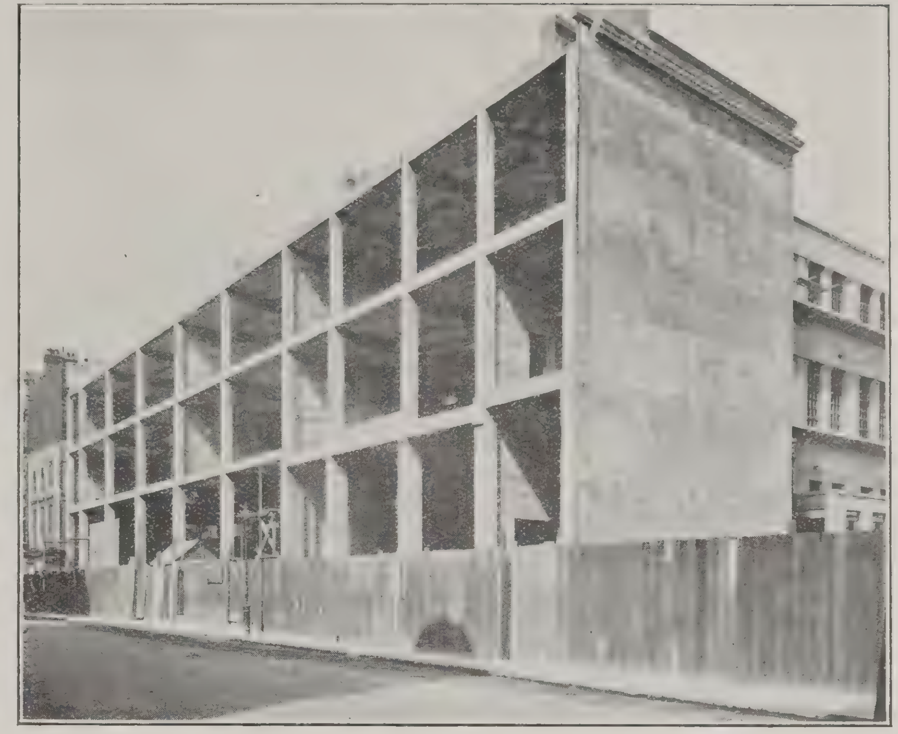


FIG. 1.—THE NEW WESTERN DISTRICT POST OFFICE, WIMPOLE STREET, LONDON, W. GENERAL VIEW OF BUILDING BEFORE THE ERECTION OF THE FACADE.

From this view a very good idea can be obtained of the concrete shell. This is the front portion of the building, and is to have a facade of Portland Stone.

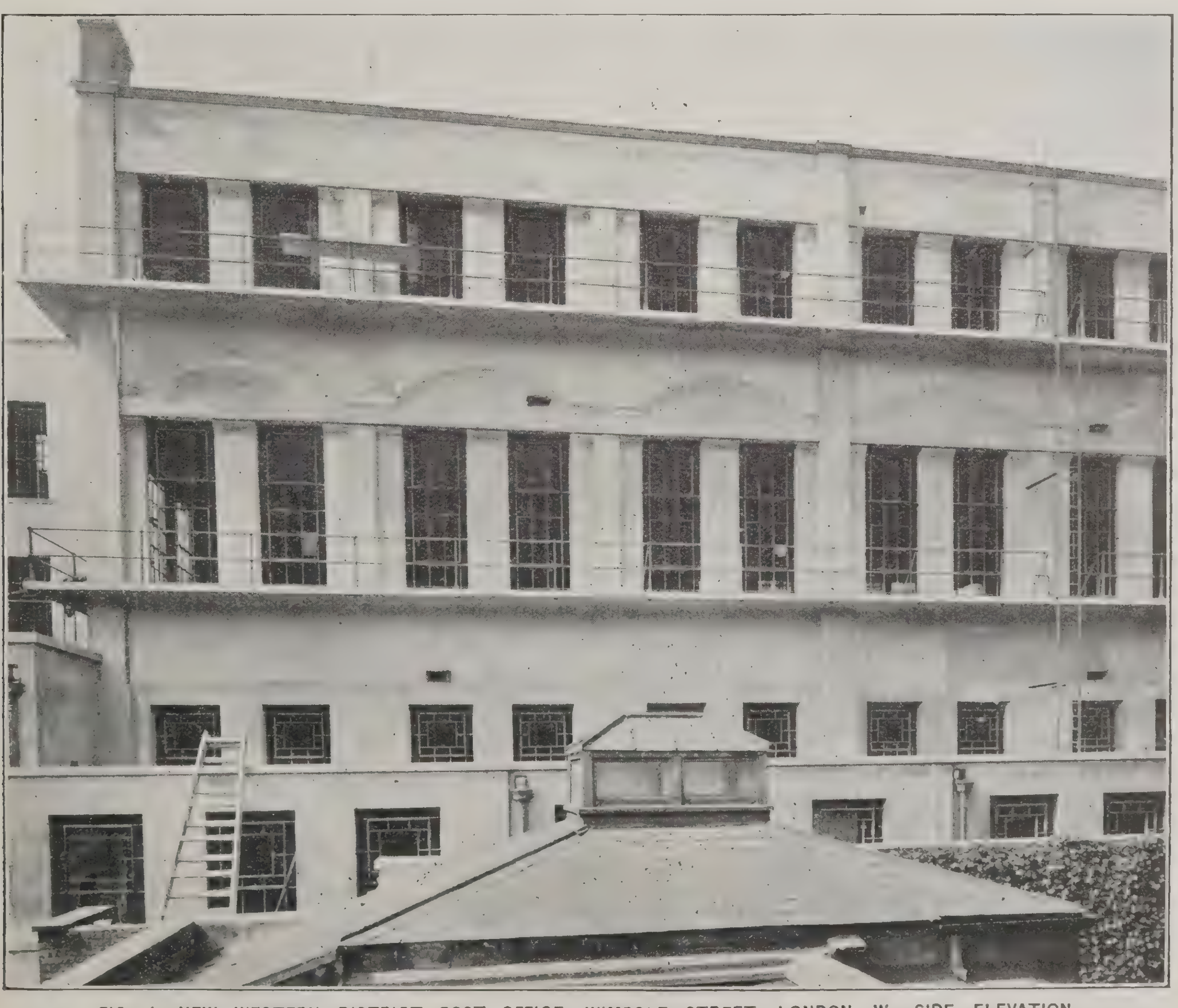


FIG. 4.—NEW WESTERN DISTRICT POST OFFICE, WIMPOLE STREET, LONDON, W., SIDE ELEVATION.

That a reinforced concrete facade can be designed to give a good effect is shown by the above illustration. The lines are extremely simple and pleasing, and are improved by the simple balconies which form a means of escape from fire.

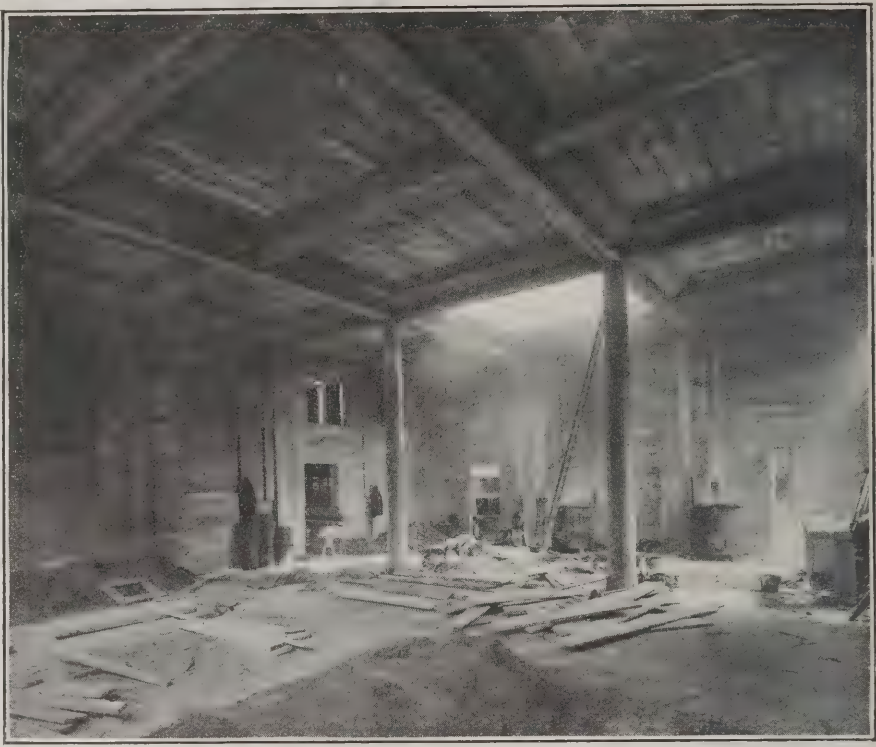


FIG. 2.—THE NEW WESTERN DISTRICT POST OFFICE, WIMPOLE STREET, LONDON, W.

This view shows the large Public Office; the dimensions being 38 ft. width, 50 ft. depth, and 18 ft. height. The slender columns (14 in. diameter) support a weight of many tons.

that the principal beams, supporting the first floor, second floor, and roof, are suspended by means of strong stirrups to beams formed in the thickness of the internal walls surrounding the inner court. By this means of construction it has been possible to obtain a maximum height for the windows.

Another feature worthy of notice is to be found in the great beams (which are over 12ft. in height) that suspend the beams supporting the principal floor. These beams have a series of windows in the portion which is underneath the first floor, and is situated below the neutral axis.

The photographic view shown in Fig. 1 represents the frontage of the building as it now stands, previous to the erection of the Portland stone front which will cover it.

All the walls, from basement to roof—a height varying from 60ft. to 70ft., are only 6ins. in thickness, and they are entirely erected in armoured concrete. On the roof has been built a large water tank that has a capacity of 7,500 gallons.

The public office is of considerable magnitude, the depth from the frontage being 50ft., the width 38ft., and the height 18ft. Fig. 2 shows this office, in which will be seen two circular columns supporting the floor and the walls, the weight of which amounts to many tons. Attention may be drawn to the slenderness of the columns. These are only 14ins. in diameter—a very striking and clear illustration of the fact that reinforced concrete columns can be constructed on a slight scantling to support heavy loads.

Fig. 3 gives a photographic view of one of the watching galleries that are erected on each floor. These are rather remarkable, as it will be seen that the gallery itself is entirely in cantilever, and has no bracketed support whatever.

Fig. 4 gives an exterior view of the south wall, showing the windows on the ground, first, and second floors. The second row of windows from the bottom are the windows referred to in a previous paragraph as being formed in the beam which supports the main beams of the principal floors. It will be noted that this elevation has been treated as a concrete structure, and has just been covered with two coats of plaster, together ⅝ins. thick, the backing coat being ½in. thick and the finishing coat ⅛in. The composition of the material was 3 to 1 of sand and cement. The entire structure has been carried out by Messrs. William King and Son, contractors, of 3, Vauxhall Bridge Road, London, licensees of Messrs. Edmond Coignet, Ltd., on whose system the building has been constructed. The "Ferrocrete" brand of Portland cement, manufactured by the Associated Portland Cement Manufacturers (1900), Ltd., has been used throughout, and mild steel round section bars, compose the reinforcement.

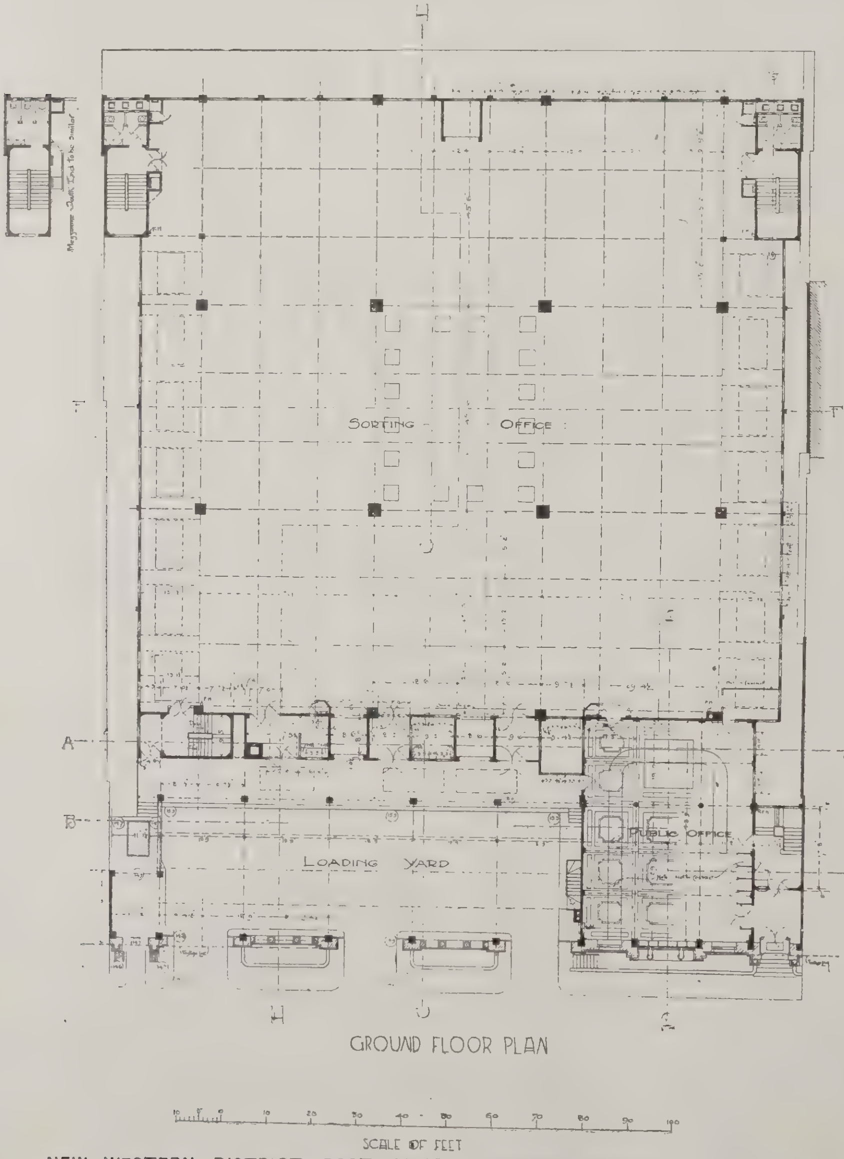
Messrs. C. John Mann and Son have removed from 29, Great George Street, to 50, Parliament Street, Westminster, S.W., the Government having acquired the former building for the extension of the New Public Buildings. The firm's telephone number remains the same—1670 Victoria.

* * *

A petition is being prepared for presentation to the Ecclesiastical Commissioners praying for the preservation of the last of the beautiful old streets of Georgian houses in the immediate precincts of Westminster Abbey and the Houses of Parliament. Cowley Street and Barton Street constitute the present threatened area.

* * *

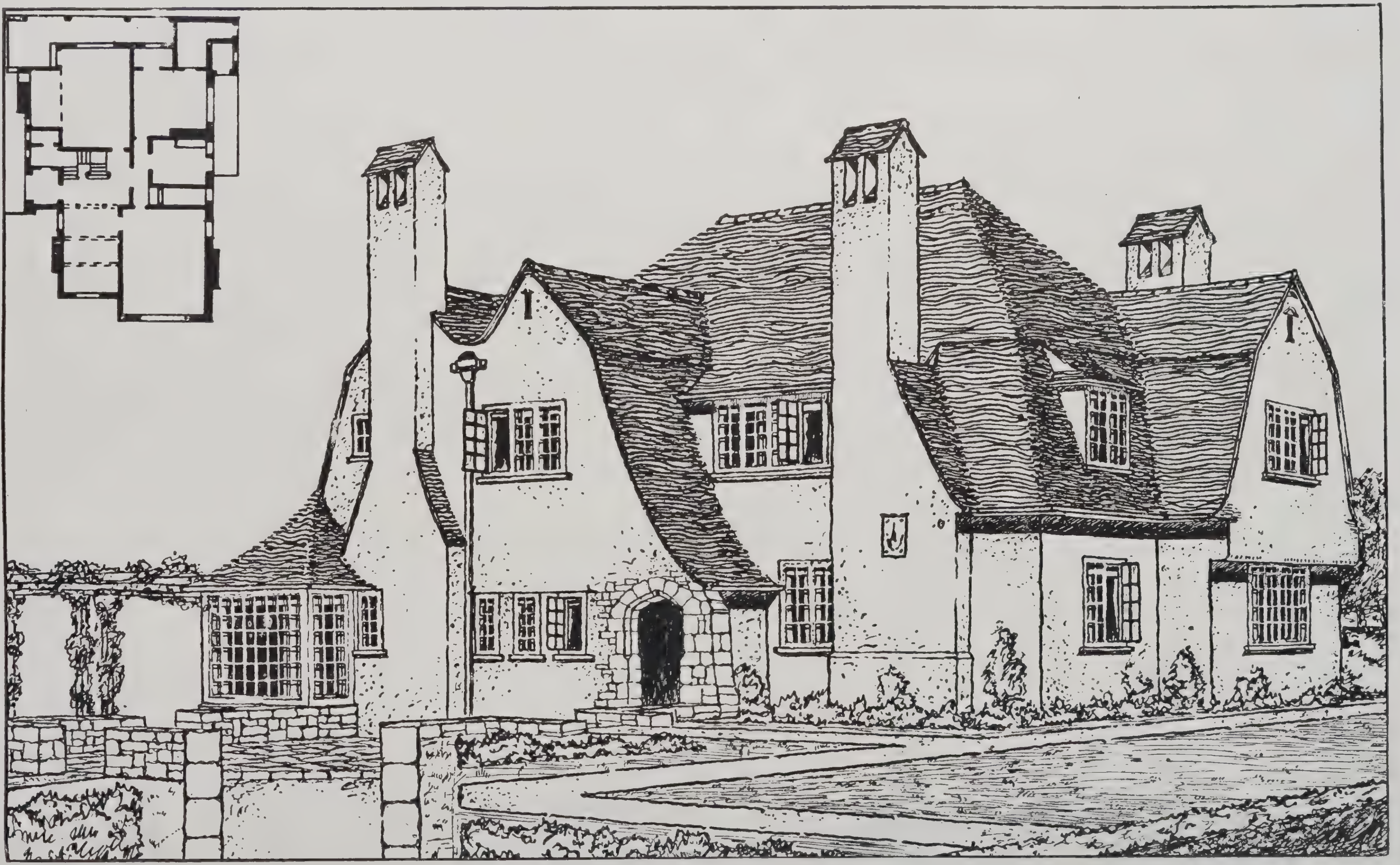
The "finest avenue in the world," that of the Champs Elysées, Paris, is to be improved by making the avenues of La Grande-Armée, Neuilly, and La Defense continuous and uniform, so as to form one great avenue, extending from the Place de la Concorde to the St. Germain Terrace—a straight stretch, as we measure it on the map, of about three miles and a-half. This splendid scheme of town planning has been definitely adopted.



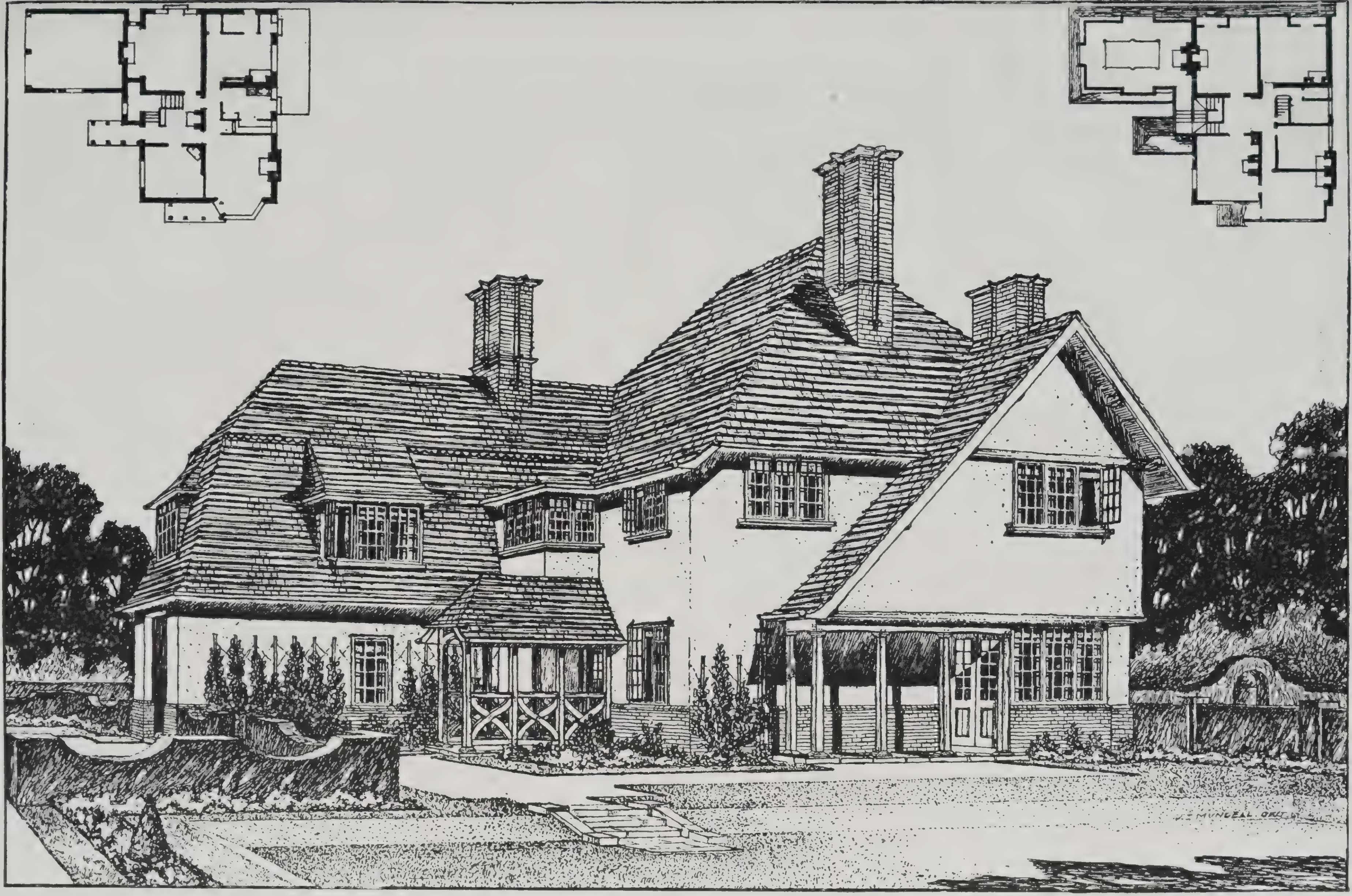
NEW WESTERN DISTRICT POST OFFICE, WIMPOLE STREET, LONDON, W.

The hatched walls in the front represent the Portland stone and brick facing. The striking difference between the thickness of these and of the reinforced concrete walls, will be duly noted.

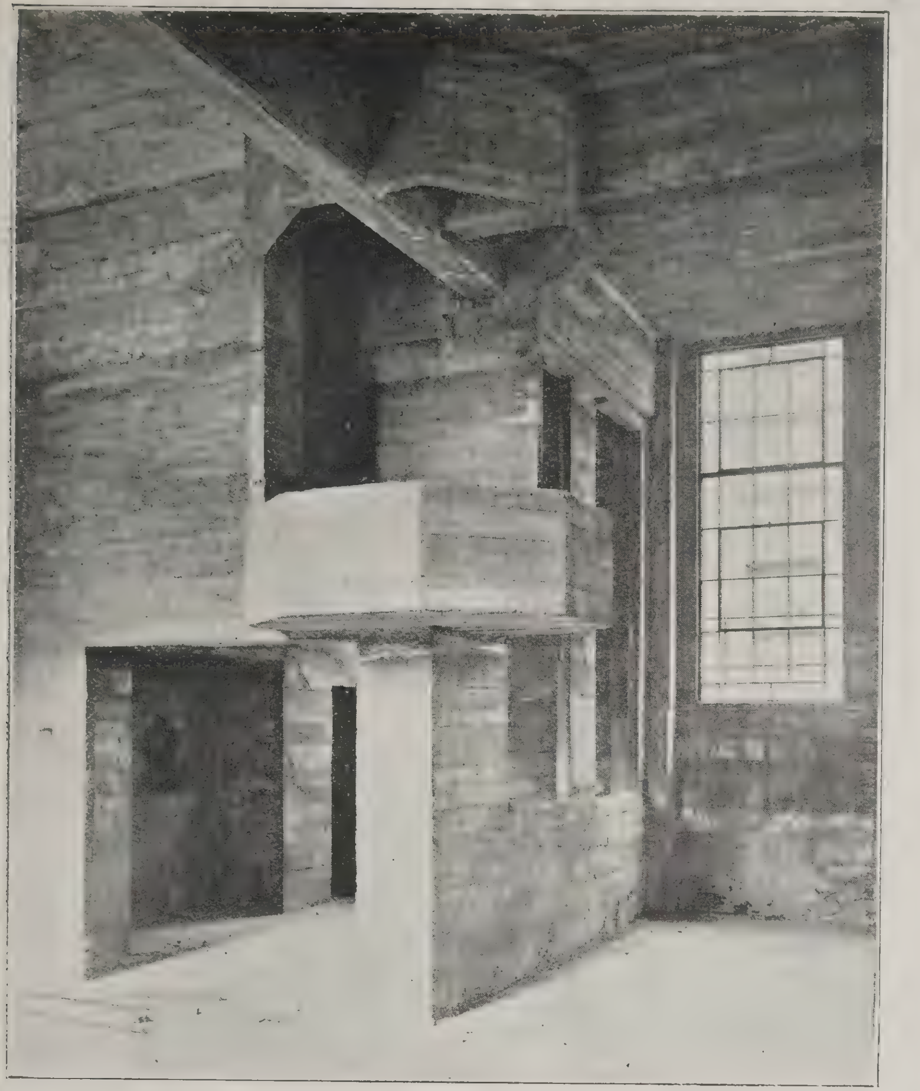
OF THE
UNIVERSITY OF ILLINOIS



HOUSE FOR C. J. HEFFER, ESQ., AT SUTTON, SURREY. H. D. SEARLES-WOOD, F.R.I.B.A., ARCHITECT.


MUNCEAL. DELT.

"HILLRIDGE," SUTTON, SURREY. H. D. SEARLES-WOOD, F.R.I.B.A., ARCHITECT.



IG. 3.—THE NEW WESTERN DISTRICT POST OFFICE, WIMPOLE STREET, LONDON, W. DETAIL OF WATCHING GALLERY.

This is a detail of one of the supervision galleries which are erected on each floor. These galleries are rather remarkable; the gallery is entirely in cantilever, and has no bracket support whatever.

Buildings in Progress and Completed.

CARDIFF.—A new mission hall, to seat
o people, in connection with the City Mis-
on at Milton Street, has been opened.
essrs. Spiers and Bevan are the architects,
d Messrs. Tucker Bros. the builders.

CHESTER.—A new Freemasons' Hall is
ing erected in Hunter Street at a cost of
out £3,000. The building will be built of
abon pressed bricks, with Cefn stone dress-
gs. The floor of the entrance hall will be
black and white marble squares, laid
mond pattern. The principal rooms in
building will be the lodge-room and ban-
eting-room, each 45ft. by 35ft., but the ban-
eting-room will be capable of being ex-
ded to 55ft. by 35ft. It will have a spring
or. In addition to these large halls there
l be four entertaining rooms, which can
used as committee rooms, or for whist
ves, small meetings, etc. The kitchen
ommodation is on most modern and con-
ient lines, while there are to be well-ap-
nted lavatories on each floor. The
mises are to be heated by hot water. The
ge-room ceiling will be coved, while the
queting-room ceiling will be panelled and
iched with cornices. The basement will
useful at some future time for conversion
either a large billiard-room or clubroom.
building, which is to cost £3,000, has
n designed by Bro. Arthur F. Davies
essrs. J. H. Davies and Sons), the present
Senior Warden of the "Travellers'" Lodge, and the builder is Bro. McLellan (Messrs. McLellan Bros.), the W.M. of the same lodge.

DERBY.—New Sunday schools for St. Augustine's Church are being erected. The first portion to contain 352 girls and 300 infants has been let to Mr. Henry Chattle, of Empress Road. The architects are Messrs. Naylor and Sale, FF.R.I.B.A., of Market Place, Derby.

GLASGOW.—The new Free Church in Crow Road is to be built of white freestone, and will accommodate 450 persons. At the rear will be a small hall to seat 100 persons, with vestry, ladies' room, a large class-room and lavatory accommodation. The architects are Messrs. Alex. Pirie and Son, 134, Wellington Street.

LONDON.—The rebuilding of the Duchy of Cornwall property in North Lambeth is to be proceeded with immediately. Contracts have been entered into amounting to £30,000.

Messrs. Patman and Fotheringham, Ltd., have obtained the contract for a large block of chambers at Brick Court, Temple, for the Honourable Society of the Middle Temple. Sir Aston Webb, R.A., and Mr. H. J. Wadling are the joint architects.

PRESTON.—Messrs. W. Croft and Sons, Ltd., of Preston, are the successful contractors for the erection of new offices for the Preston Shelley Assurance and Burial Society. The building is estimated to cost £5,000, and will be of polished granite up to the first floor level and brick and stone above. Mr. E. J. Andrew is the architect.

THE CONCRETE INSTITUTE.

Mr. Bamber on "The Setting of Portland Cement."

The fifth general meeting of the Concrete Institute was held on Thursday evening, May 27, at the Royal United Service Institution, Whitehall, S.W. Mr. Wentworth Shields presided, and among the numerous members present were:—Messrs. Wells (hon. treasurer), H. K. G. Bamber, F.C.S., Bertram Blount, F.I.C., D. B. Butler, Assoc.M.I.C.E., F.C.S., W. H. Stanger, W. Lawrence Gadd, C. S. Meik, J. N. Yourdi, Dr. Siegmund Rosenfeld, etc., etc.

The Chairman announced that, through indisposition, Mr. Hatch, who was to have taken the chair that evening, was unable to be present. The membership of the Institute had now reached the satisfactory number of 740, and he thought that showed that not only was the Institute doing good work, but also that the members of the various professions were beginning to recognise the fact.

Mr. H. K. G. Bamber then read a paper on "The Setting of Portland Cement," having first expressed his regret that, owing to the interdiction of the authorities, he was unable to bring a cinematograph into that building, with which he had intended to illustrate his remarks. The following is a short abstract of the paper:—

For the best cement, the total percentage of lime (CaO) present was confined to very narrow limits—i.e., 63.5 to 65 per cent. The amount of silica (SiO_2) varied from 21 to 22.5 per cent., and alumina (Al_2O_3) from 5 to 6 per cent., so that the ratio of lime to silica approximated 2.8 parts lime to 1 part silica, the formula for which might therefore be written as $3CaO\ SiO_2$, and any attempt to vary this ratio to any extent resulted in a material which had not the good properties of a true Portland cement.

The theories as to the setting were somewhat vague and uncertain; but it was generally assumed that the action was brought about first by the hydration upon the addition of water, and subsequent crystallisation of the calcium aluminates present, which occurred with great rapidity, constituting what was known technically as the "initial set," causing cohesion of the mass of cement and the intermingled aggregate. This was followed by the hydrolysis of the calcium silicates, the latter being slowly decomposed and broken down into the more simple form of mono-calcium silicate, with the consequent liberation of calcium hydrate ($Ca\ OH_2$), which being in excess of that required to form a saturated solution partially crystallised out—this cycle of operations continuing over long periods during the hardening of cements.

A thoroughly well-made Portland cement clinker, ground to normal fineness, was always very quick-setting, almost equal to that of plaster of Paris, but this property of rapid setting could be somewhat delayed by mixture of other foreign substances.

It was difficult satisfactorily to explain why the admixture of the fuel ash should have the effect of retarding the setting time somewhat, unless it was that it contained an amount of sulphates derived from the oxidised sulphur compounds originally present in the fuel used, and these sulphates having a similar effect on the cement as the addition of a similar amount of gypsum—or it might be that owing to the less perfect burning of cement in the past, cement always contained free lime in the amorphous, as distinct from the crystalline condition—this lime being quickly dissolved in the water used for gauging, which becoming saturated, prevented the solution of the calcium aluminates, and thus somewhat retarded the set.

During recent years, and upon the introduction of new methods, more particularly that of the rotary kiln, none but this pure character of clinker was produced, containing practically no free lime in the amorphous condition—the system being such that the ash from the fuel, the latter in quantity being in itself at least 33 per cent. less, to a very large extent passed away with the effluent gases from the kiln. This also applies largely to the sulphur compounds in the raw material and coal, which, being decomposed, passed out of the kiln as sulphurous acid with the other gases. The clinker thus produced was practically pure, and resembled those portions of picked uncontaminated clinker from the intermittent kiln and like that, had, when finely ground, an almost instantaneous set, and with a lime content on analysis in both cases ranging between 64 and 65 per cent.

Very elaborate and costly experiments, extending over a long period, had been carried out, in which the calcined clinker, after passing the clinkering temperature, was kept at a red heat for a considerable time before final cooling, imitating, it was thought, the slower action of the old intermittent kiln process; but the results were negative.

Experiments were also carried out to test the concentrated action of carbonic anhydride upon these various aluminates, this being the principal ingredient in the atmosphere which, together with water, brought about the natural process of aeration of cement. It was found that the aluminates containing the higher proportion of lime were less affected by this treatment with CO_2 than the lower aluminates, which it was thought might be the explanation why rotary cement was less affected by exposure to the atmosphere than cement made in intermittent kilns. The presence of even small proportions of calcium aluminate would cause a very rapid initial set of the whole mass.

Various methods of prolonging the setting time of cement without having recourse to the mechanical addition of retarders to the finished cement had been attempted, such as the injection of solutions of the alkalies and alkaline earths, and such like, upon the hot clinker during its passage through the cooler, but all these had met with only limited success, the results obtained being in many cases evanescent, and in others creating further mechanical difficulties in the grinding of the clinker, which rendered such processes physically and commercially undesirable.

The product of the present-day rotary kiln, calcined in small particles at a uniform temperature and in the absence of fuel ash, consisted, as one would expect, almost entirely of pure clinker. The only methods known to the ancients of retarding the setting time of this heterogeneous mixture of silicates and aluminates was by exposing such cement after grinding to long periods of aeration or by the addition of gypsum in one form or other. The first process was only successfully applicable in the absence of added gypsum, and the effect of prolonged aeration of such cement was the absorption by the uncombined lime and the loosely combined silicates and aluminates, etc., of water derived from the moisture in the atmosphere, and subsequently carbonic anhydride from the same source. In this manner a considerable quantity of the material became carbonated and inert, depriving the cement of a not inconsiderable portion of its former chemical activity and thus causing a prolongation of the setting time. Such a method must be most imperfect in its action, and required a considerable length of time to enable the moisture and the carbonic anhydride in the atmosphere to find its way into the interior portions of the heap, by which time the outer portions would be considerably over-aerated and become practically inert. The old method of simple aeration in bulk to retard the setting time could not be applied with any degree of the former success to the product from the rotary kiln, and this would also seem to be evidence that the cement manufactured by the more modern process was of a much more stable and reliable character that that formerly put upon the market.

In view of the fact that this simple method of aeration in bulk could not be successfully applied to cement manufactured on the new system, many attempts were made to accomplish the most important part of natural aeration, i.e., the absorption of water, by artificial means, such as passing the ground cement through a moist atmosphere, or by blowing moist air through the cement in bulk.

These methods, however, were not found to be wholly successful, first, from the physical and mechanical difficulties which presented themselves by reason of the partial setting of the finest portions of the cement, with the consequent blocking of any apparatus used for the purpose, such as revolving drums, distributing discs, conveyor screws, and scrapers, and the like; and secondly, in the author's opinion, for the much more important reason that, in order to accomplish the desired result in a short space of time, it was necessary to submit the cement manufactured by the rotary process (all of which consisted of finely reduced particles of the pure calcined clinker) to a moist atmosphere at a comparatively high temperature, as distinct from the normal temperatures under which all the previous attempts at artificial aeration had been carried out. A process was introduced in which advantage was taken of the peculiar construction of the mills chiefly used for completing the reduction of the cement to a fine powder in enclosed revolving cylinders, known in the trade as "tube mills," which contained as their grinding media a heavy charge of steel balls or flint pebbles. The friction due to the action of the attrition of the steel balls or flint pebbles against themselves, the sides of the mill, and the passing cement, caused the temperature in the tube mill to be still further increased, and it was at this point where moisture was introduced in the form of a regulated supply of steam, which still further increased the temperature and enabled it to be maintained at a point above 180 degrees Fahr., preferably about 200 degrees Fahr., at or above which temperature the operation is most successfully conducted, and the cement operated upon was made to take up uniformly throughout an amount of water, in practice about 1 per cent., or a little under, with which it combined chemically, and which could not be expelled except by ignition.

With cement containing sulphates equivalent to about 1.5 per cent. SO_3, derived from the sulphur compounds in the fuel, it was generally sufficient to add 1½ per cent. of gypsum to obtain a slow-setting cement; the effect, however, in most cases was only transient, as aeration, even when the cement was packed, almost invariably resulted in such cement returning first to its original quick-setting condition before subsequently becoming slow setting, and largely inert through excessive exposure to the atmosphere. This peculiarity of cements slowed by gypsum had been the cause of much difficulty to the manufacturer, and many conflicting theories were propounded as to the cause of such reflex action.

It was difficult to give any definite chemical or physical explanation of the fact that the presence of as little as 1 per cent. of combined water in cement, which had been taken up at a high temperature, should not only in itself have the effect of appreciably slowing the setting time, but that when present in conjunction with even small percentages of gypsum the slowing effect of the combination was maintained. The presence of 1 per cent. of combined water had also an enormous influence on the action of cement when tested for soundness under the boiling test, more particularly under the method invented by Le Chatelier and now usually adopted, by which method and with which apparatus it was thought the actual expansion of the cement could be measured.

By means of the steaming process the proportion of gypsum required to be added to produce a slow-setting cement was much reduced, and if advantage were taken of the greater solubility of plaster of Paris ($CaOSO_3 \frac{1}{2} H_2O$) over that of raw gypsum ($CaOSO_3\ {}^2H_2O$) the quantity of SO_3 introduced into a cement might be reduced to a minimum.

The period of immersion before boiling stipulated in the Le Chatelier test was a very important factor in effecting the results, and appeared to be entirely arbitrary. It might be that certain cements, perfectly sound in cold and in boiling water, and especially those of a very slow-setting character, would fail to pass if boiled twenty-four hours after gauging, whereas at thirty-six or forty-eight hours, or even longer, the results might be perfectly satisfactory.

The expansion of certain cements when boiled might be due to (1) an insufficient reduction and amalgamation of the raw materials (2) incomplete or irregular calcination, or (3) a predominance of small unground particles of clinker in the finished cement. The mere reduction of the clinker to a fine powder did not in any way change the chemical composition of the cement, and if any difference was noticeable under the Le Chatelier boiling test between a finely ground and the same coarsely ground clinker, the former being perfectly sound and the latter showing expansion, this expansion must be due to the action of water at a high temperature on these particles. In the author's opinion the conclusions drawn from the results of tests under the Le Chatelier method, brought about through this latter cause, might be misleading, because it was assumed that these particles causing expansion consequent upon hydration at a high temperature, would equally expand at normal temperatures, which had yet to be proved. While cement manufactured from clinker chemically well balanced and thoroughly calcined would expand when submitted to the Le Chatelier test, it would not expand under the same conditions if it had been previously treated by the hydrating process.

Attempts had been made to use other materials for regulating the setting time, such as calcium chloride, sodium carbonate, etc., etc., but as far as the author was aware these methods have not proved commercially successful. At the present time the processes employed were practically confined to watering the clinker, hydrating by means of steam during grinding, and the addition of gypsum. With these methods individually, or with a combination of same, cement could be produced having setting times suitable for all requirements.

At the conclusion of the paper, the Chairman remarked upon the interest and importance of Mr. Bamber's experiments and conclusions.

Mr. Bertram Blount said that the paper was a serious and a solid contribution to a pressing matter. The notion current a few years ago that there was some inherent difference between cement from a rotary kiln and cement from the old fixed kiln had been exploded many times, and the *coup de grace* had been given by Mr. Bamber. There was a most ingenious and useful suggestion in the paper, where the notion was put forward that the adjustment of a combination of aluminates and silicates in the cement might depend upon a number of conditions, influenced by the rate of cooling, or by the maximum temperature reached, influenced in such way as to decide which of the two acid bodies would ultimately get hold of the lime. With regard to the temperature at which hydration occurred the more easily, Mr. Bamber, by his own ingenious method of putting steam through a tube mill, had discovered that hydration proceeded more controllably and systematically, and was a far better ultimate result when the average temperature was about 180 degrees to 200 degrees Fahr. That would show that if they wished to control the setting time of cement which was inconviently quick, it was better done in a bath at about that temperature, even if the apparatus was stationary. He joined issue with the author on the subject of the Le Chatelier test as now practised. He acknowledged Mr. Bamber's large experience with his own cements, but he (Mr. Blount) could claim an even larger experience with cements of the world, and he said without hesitation that, although there might be some cases in the use of the Le Chatelier test which would puzzle the best of them, notwithstanding in its present form it was a satisfactory and a fair test, and a test that was accepted by users, engineers, and manufacturers alike, and until someone came forward and provided a better, he for one should stick to it.

Mr. D. B. Butler said that in research of this kind the two great difficulties were time and expense. It was no small matter of expense to find the apparatus for this work, and he thought that this was a matter which could be properly taken up by the National Physical Laboratory. We were behind our cousins over the Atlantic in this respect. With regard to the Le Chatelier test, it was a fact that cements which were unsound would show large expansion in the Le Chatelier test, but it was also a fact that hundreds and thousands of cements which had given perfectly satisfactory results in actual work had shown very large expansion. Why was that? If those cements were unsound, the work should have gone wrong.

Dr. Siegmund Rosenfeld said that Mr. Bamber had stated that by adding 2 per cent. of gypsum the cement showed very great expansion. He had found that even adding up to 4 or 5 per cent. of gypsum the cement remained perfectly sound, so long as the raw materials were properly prepared. The expansion of cement was caused by the formation of the tricalcic sulpho-aluminate, but that happened only if there was tricalcic aluminate present, and this tricalcic aluminate could only be formed if there was an excess of lime present, and that again occurred only when the cement was badly prepared. He contended that if the raw materials were properly prepared, and it was reduced to a very fine state, one could have up to 4 or 5 per cent. of gypsum without showing any great expansion.

Mr. G. N. Yourdi said that in spite of what they had heard that evening with regard to gypsum, he was still a firm believer in aeration. When he was in a fix in the summer he conceived the idea of filling his cement with hot steam, and in that manner he succeeded in aerating his cement in less than a fortnight, whereas before it had sometimes taken from three to six months. Notwithstanding what Mr. Bamber had said, he thought he should still stick to aeration.

Mr. W. H. Stanger and Mr. W. Lawrence Gadd also contributed to the discussion.

The Chairman said that as it was rather late, and as there were several gentlemen who still wished to say something with reference to the subject of the paper, he suggested that they should adjourn the discussion till a later date He asked those present to hold up their hands if they would rather hear Mr. Bamber's reply at once.

No single hand was shown, a fact which caused considerable amusement in view of the manner in which chairman had put the question; and it was decided to adjourn the discussion and Mr. Bamber's reply to a later date, which will be duly announced

Mr. Bamber said he would like to say that, in spite of his criticisms of the Le Chatelier test, he believed it to be the best they had at the present time, and that its insertion in specifications had done more to improve the quality of cement in Great Britain than any other test they had heard of.

In a treatise on earthquake-resisting construction ("La Casa Antisismica"), Signor Giuseppe Torres advances the theory that circular forms ought to be adopted, to the exclusion of all others. He points out that Nature affords numerous examples proving the resistance of round forms to sudden horizontal pressure. In the last disaster in Sicily and Calabria, the circular parts of buildings usually resisted the shock, whilst the rectangular parts were completely destroyed; and the author cites as examples the cathedral of Messina, the Church of the Rosary at Reggio, and the ancient towers of Bagnara and Reggio. Signor Torres therefore concludes that cylindrical and domical forms are best capable of resisting shocks and of transmitting vibrations uniformly throughout the structure. He shares the general belief that reinforced concrete is the best material to employ, as it is "homogeneous" (as we should say, monolithic), and offers "the minimum of thickness with the maximum of lightness." The book is published in Rome.

Fire Prevention Notes.

Legislation for Fire-prevention. Fire insurance companies offer a special inducement to the erection of substantial fire-resisting buildings, in the shape of the reduced premiums which they agree to take on this class of structure. The arrangement works very well between the various offices and the public; but it is questionable whether, from a national point of view, this is a sufficiently enlightened attitude to take. At present the good builder is rewarded and the indifferent one penalised. But as a nation we ought not to regard fire-resisting construction as entirely a matter of adjustment between the fire offices and their clients. To some slight extent the by-laws have made for better, and therefore more fire-resisting, methods of construction; but for the general safety, and for the better protection of public buildings and buildings of historic and artistic interest, there ought to be more stringent regulations in regard to fire-resisting construction generally. The question of premium rates is not a matter of public politics or social well-being; but as a possible limit can never be set to the extent of a fire, it is the more desirable that our important buildings should be protected from possible ravages. We have many laws on the statute book devised for the protection of human life from risks other than fire, for the compensation of employees injured by defective buildings and fixtures; but we endanger the lives of many thousands of people by the erection of inflammable buildings, and have no legislative enactments to meet the evil. Human life must always play the largest part in our consideration of fire prevention; but beyond that we ought to take measures to prevent possible damage to, or the irreparable loss of, many important buildings which are endangered through the neighbouring structures not being constructed in a fire-resisting manner. This conclusion has been the more forcibly impressed upon us by seeing a city warehouse, in which goods of a particularly inflammable nature are stored, and which was recently burnt out, reinstated with naked stanchions and open boarded floors as in the old structure.

Fire Loss in America. It has been computed that the average weekly destruction by fire in the United States of America includes the burning of three theatres, three public halls, twelve churches, two hospitals, two asylums, two colleges, twenty-six hotels, three department stores, six apartment houses, two gaols, and one thousand six hundred dwellings. It is not surprising therefore that in face of this enormous loss business men in America should be devoting their attention very seriously to the subjects of fire-resisting construction and fire-prevention. In some years the loss by fire in the United States has reached the tremendous sum of £120,500,000, or 25s. per head of the population, and these figures do not include loss consequent on the dislocation of business, or the loss of profits occasioned to a business while it is temporarily suspended. The annual fire loss per head of the population in the United States is estimated at about 10s., while that of all the European countries combined does not exceed 1s. 4d. While these figures are very flattering to the progress of building construction in Europe there is little doubt that the Americans are greatly hampered by the immense number of wooden and other combustible buildings which exist all over the United States. The great forests which fell an easy prey to a population on the look-out for an extensive supply of cheap and serviceable building material, are no doubt responsible for this condition of things, but the erection of so many wooden buildings—and in many of the surburban districts of the big cities all the houses are of wood—has necessarily greatly increased the fire-risks. Given a good big starting fire and a favourable wind, and the great conflagrations with which American fire history is associated are not merely easily explained, but appear almost a normal outcome and occurrence. Fortunately the evil of wooden buildings has brought its own cure eventually. The great depletion of the American forests, and the movement for the conservation of what remains, are making timber dearer and reducing its advantage in point of cost over other points of construction.

Fire Prevention and Progress. We are more or less accustomed to the view of the American Press that a great conflagration, such as the wiping out of a whole town, is an incentive to progress, inasmuch as the rebuilding of the town will probably be carried out on improved lines both as regards its layout and the construction of its buildings. The advantage on this side seems illusory and something akin to a child building structures with a box of bricks, which are knocked down to be replaced by other erections, and so on *ad infinitum*. The acuteness of the intelligent American business man has now been directed to the problem, and he is beginning to ask himself whether the game is worth the candle—whether, in fact, progress is really served by a supine attitude concerning preventable fire damage. It may be said that a very cursory examination has convinced him that nothing is served by taking big fire-risks, except perhaps a childish craze for the novelty in the rebuilding of towns and the preparation of new town plans; and on the other hand, as American insurance offices "are not in business for their health," he and all his fellow-countrymen, are paying heavily for the doctrine of *laissez-faire*, in the shape of enhanced premiums on their policies. It is fairly safe to say, however, that the increased price of timber has been the main factor in inducing the United States citizens to take a more enlightened and progressive view of fire-resisting construction.

Popularising Fire-prevention. The effort to popularise fire-prevention has yet to be made. Big and costly buildings are now, as a rule, constructed on fire-resisting principles as regard the main structure, though the fittings too often fall short of the high standard observed in walls, roofs, floors, casements, and doors. The big things seem, for the moment, to receive the utmost attention, while the little things, which are nevertheless little things that count, seem to be strangely neglected. In the great wholesale houses, as well as in the smaller retail shops, highly inflammable woodwork, loaded with still more highly inflammable goods, is found at every turn, the whole forming a well-laid train of combustibles that seem to invite the ignition that may occur at any moment in any one of a thousand different ways. Fire, like disease, is in nine cases out of ten preventable; and it is astonishing that the insurance companies do not insist more generally and more rigorously on the adoption of the elementary precautions for which, nowadays, the facilities are abundant. Fittings need not be combustible. Woodwork, and even fabrics, can by various means be rendered safe against the ordinarily swift effects of casual contact with flame; and why the insurers do not insist on the general employment of such means is one of the many little mysteries that baffle conjecture. They cannot, surely, be afraid that the popularisation of fire-prevention will ultimately result in a serious shrinkage of insurance business. It is true that, in the United States, complete confidence in the hollow-tile system of fire-resisting construction of dwellings is believed to have rendered householders careless of insurance; but, even when human ingenuity in fire-prevention has reached its limit, fires will continue to occur. But as they will be much less frequent, and individually far less costly, the companies will not be called upon to provide against the enormous risks upon which their premiums have been hitherto based. They will therefore be able to reduce materially their premiums, so as to make universal insurance well worth while, so that the popularisation of fire-prevention may possibly result in the popularisation of fire insurance. This is not so much of a paradox as at first sight it seems. The public conscience in this matter is awakening, and the public view is consequently broadening. The man who has become aware of the necessity for adopting the means of fire-prevention will have less hesitation in insuring himself against the contingencies that, as his better education in such matters will enable him to see with increasing clearness, can never be wholly eliminated; but having spent more on fire-prevention, he will justly expect to spend less on insurance; and the companies will surely see the wisdom of accepting much smaller premiums for greatly reduced risks.

A New Fire Extinguisher. In a new system of fire-extinction, which, while it is particularly adaptable for use on board ship, might probably with advantage be adopted in large premises on shore, the apparatus comprises a blower, a turbine engine, a cooler, and a distributor, all compactly arranged so as to occupy but little space. The extinguishing medium is flue gas, which is washed and cooled before being presented to the fire that is to be extinguished. At a recent demonstration, given in the yard of Messrs. R. and R. Green, of Blackwall, a large pile of faggots, burning fiercely, was extinguished in less than fifteen seconds by means of gas from an adjacent boiler chimney. Attached to the apparatus, which is the invention of Mr. George Harker, B.Sc., of Sydney, and Captain T. L. Grainger, marine surveyor, is a fumigator for killing infectious germs.

London Fire Brigade: New Chief Officer. The London County Council are inviting applications for the appointment of Chief Officer of the London Fire Brigade. This officer must be no mere man, but a superman. "He must be of robust health, strong and active, and his age, unless he is or has been an officer in the London Fire Brigade, must be not less than thirty and not more than fifty years on Thursday, 10th June, 1909. He must possess a sound knowledge of mechanics, and have had experience in dealing with men"—a sentence that reminds one of the absurdity of the now nearly obsolete habit of calling workmen "mechanics." Nowadays, however, no confusion is likely to arise in consequence of the nevertheless awkward wording of the sentence. The Chief Officer is to have £900 a year, with free quarters, coal, light, and medical attendance, with £12 a year for uniform clothing and boots. The latest time for receiving applications is Thursday, June 10th. at 11 a.m. There will be no dearth of applicants for the position, which is coveted by the right type of man because it is richer in honour than in emoluments, and because it offers rather more than an off-chance of a hero's death. It is certain that the man selected will be one of many "captains courageous;" but it is almost too much to hope that to pluck, endurance, and administrative capacity he will add the large and penetrative intelligence that enabled Captain Shaw, for instance, to add so much to the knowledge and the philosophy of fire prevention. The new chief, given a fairly long tenure of his onerous and honourable office, may possibly play an important part in a complete revolution of fire-prevention methods and organisation.

International Fire Service Council. Among the foreign delegates at the business meeting, recently held in London, of the International Fire Service Council were the following chief officers: Messrs. Meier (Amsterdam Fire Brigade), Reichel (Berlin Royal Police Fire Brigade), Westphalen (Hamburg Fire Brigade); the hon. secretary, M. de Marie (Luxemburg), and the hon. treasurer, M. Philips (Belgium). The International Fire Service Council comprises 100 delegates, representing thirteen countries. The executive, comprising fifteen members, have their offices at Amsterdam. Several of these gentlemen, as we reported in last week's issue, were present at the dinner of the British Fire Prevention Committee, where two of them made excellent speeches, Chief Officer Meier, of Amsterdam, making a characteristically gallant onslaught on the English language. While in London, the delegates naturally took the opportunity of visiting our chief fire stations, where, it is to be feared, they found more to admire in our men than in our methods. The interchange of visits between the fire officers of different countries should be fruitful of good results, since, where the common object is so broadly humanitarian, international or professional jealousy, or any kind of untoward secrecy or reservation as to appliances and practice, is quite out of the question; every zealous fire officer being, as a matter of course, normally constituted like Chaucer's Clerke: "All gladly would he learn, and gladly teach." The President (Chief Officer Meier, Amsterdam Fire Brigade), vice-presidents (Chief Officer Westphalen, Hamburg, and Mr. Edwin O. Sachs, London), and the members of the Executive of the International Fire Service Council concluded their annual business meetings in London last week. They have decided to prepare and issue a small technical pocket dictionary on fire service terms in English, French, and German, and also to publish in these three languages the results of a large number of the tests undertaken in London by the British Fire Prevention Committee, whose testing station they had an opportunity of visiting during their stay in London. They will also deal with the matter of obtaining reliable data on uniform lines as to the result of motor traction in fire brigades throughout Europe. A considerable amount of routine work was dealt with. Besides attending their meetings, the visitors have been twice entertained by the Lord Mayor at the Mansion House, and some of the party were also present at the Guildhall Banquet on Monday, May 24th. The British Fire Prevention Committee entertained the visitors on two occasions, and they have also been entertained by Captain de Courcy Hamilton, R.N.; by Mr. Edwin O. Sachs, F.R.S.Ed., Lieut.-Col. Fox, and Mr. Percy Collins, J.P. They had all facilities accorded them to see matters in which they were interested in London, and thus had both an instructive and agreeable stay in the metropolis.

Two Big London Fires. Of recent fires in London, two were rather extensive. One occurred in the basement of the premises of the Society for the Promotion of Christian Knowledge, in Northumberland Avenue, at the corner of Old Scotland Yard. Although it was energetically attacked by the firemen, was prevented from spreading to an adjacent hotel, and was extinguished within an hour, it caused damage that has been estimated at about £18,000. The goods that suffered were principally bound books. About a dozen of the society's staff were present when the outbreak occurred, but their efforts to cope with it were unsuccessful. The other fire broke out early last Thursday morning, at the premises of Messrs. W. N. Froy and Co., builders' merchants, King Street, Hammersmith. Adjoining premises, occupied by a firm of drapers and furnishers, soon took fire, and some men who were sleeping there could not be reached by the fire escapes, and were rescued with much difficulty by placing between two windows a plank along which they crawled to safety—a circumstance that seems to emphasize the need for renewed very careful consideration of the means of escape from fire. It is stated that in these premises special staircases were provided, and were used by many persons on this occasion, but that the men who used the plank were cut off from access to them. Such contingencies are among the most perplexing problems with which the architect of business premises has to deal. The damage caused by the Hammersmith fire is estimated at about £40,000.

THE DANGERS OF BREEZE CONCRETE.

By D. B. BUTLER, Assoc.M.Inst.C.E., F.C.S.

Summary of paper read before the Society of Architects.

(*Concluded from page* 417, *No.* 742.)

Breeze Sample No. VIII.—Described as "Sample of Coal Ash straight from Furnace of Paper Mills, burnt from Coal only." This sample was greyish-white in colour, and contained a considerable quantity of clinkers; the clinkers being more or less friable probably accounts for the larger proportion passing through the sieves. About 43 per cent. passed through a 1-10in. sieve, and 12 per cent. through a ¼in. sieve. Of the 45 per cent. remaining, about 20 per cent. was clinker, 23 per cent. coke, and 1½ per cent. coal. Reference to appendix X., shows that although the specimens left entirely in air developed little or no expansion, all the fractions except the coke and clinkers show rather marked expansion in water, the coal being very much the worst. Unfortunately, the quantity of coal found was so small that it was only possible to try it with one cement, but with the other fractions the results obtained with the two different cements practically corroborate one another, although Cement A develops rather more expansion in each case than Cement B.

Breeze Sample No. IX.—Described as "Sample of Ashes dropped from the Fire-bars of Furnace from Waterworks, from Coal and Coke." This sample was nearly all fine material, 4½ per cent. passing through a 1-10in. sieve, and 31 per cent. through a ¼in. seive. Of the 26½ per cent. of material remaining on a ¼in. sieve, 8.3 per cent. was clinkers, 7.3 per cent. coke, 7.48 per cent. coal, with a little ash and a few stones; as will be seen from appendix XI., the water test bars from all the fractions showed enormous expansion, the ¼in. 1-10in, and the average, expanding 4 or 5 per cent. within the first three or four days, and subsequently swelling so much as to break, and render further measurements impossible. The coal fraction expanded 3 per cent. within a week, increasing to 4 per cent. in 28 days, after which it appeared to remain practically constant. Several of the air specimens more especially of the fine material passing the 1-10in. sieve showed rapid expansion for the first day or two, and then remained practically constant, with, if anything slight subsequent contraction. It will be observed that the results obtained with the two different cements are practically identical, and corroborate one another fairly closely. The special value of the results obtained with this particular sample of breeze is that it shows very clearly that some kinds of ashes and furnace refuse are even more dangerous than coal.

Breeze Sample No. X.—Described as "Rough Ashes from Furnace of Electricity Works from Coal only." About 14½ per cent. of this material passed through a 1-10in. sieve, and 30 per cent. through a ¼in. Of the remaining 55½ per cent., 43½ per cent. was clinkers, 5½ per cent. coke, 4½ per cent. coal, and a few stones. The results given in appendix XII. show that only the finer material passing a 1-10in. sieve develops any appreciable expansion, i.e., about 1-3 per cent., which it attains in about a month, and thereafter appears to be constant. Several of the other fractions show measurable though negligible expansion ranging from .002 to .09 per cent.

A noticeable feature of the foregoing experiments is, that many of the specimens which show very marked expansion when placed under water as soon as set, expand very much less when left entirely in air. It therefore seemed a point worth determining as to whether exposure to damp or moisture would in any way affect these air set specimens at the end of the three months tests, i.e., after they had become thoroughly seasoned. One of the duplicate air bars from

APPENDIX X. Breeze Sample No. VIII. (Coal Ash from Paper Mills).

Fractions.	Percentage of original sample.	Fineness after crushing to pass $\frac{1}{20}''$ sieve. Residue per cent. on following sieves			Cement Sample used.	PERCENTAGE EXPANSION OR CONTRACTION							
						Air Bars.				Water Bars.			
		$\frac{1}{100}''$	$\frac{1}{78}''$	$\frac{1}{50}''$		1 day.	7 days.	28 days.	3 months.	1 day.	7 days.	28 days.	3 months.
Average ..	—	—	—	—	A	+ ·089	+ ·056	+ ·019	— ·010	+ ·484	+ ·568	+ ·508	+ ·496
					B	+ ·054	+ ·031	— ·010	— ·045	+ ·229	+ ·276	+ ·293	+ ·274
Thro' $\frac{1}{10}''$ sieve	42·86	63·0	57	52	A	+ ·134	+ ·156	+ ·094	+ ·060	+ ·509	+ ·537	+ ·533	+ ·521
					B	+ ·099	+ ·096	+ ·049	+ ·010	+ ·359	+ ·417	+ ·433	+ ·411
Thro' $\frac{1}{4}''$ sieve	11·74	73·0	68	63	A	+ ·229	+ ·271	+ ·219	+ ·190	+ 1·069	+ 1·211	+ 1·218	+ 1·221
					B	omitted	+ ·162	+ ·120	+ ·091	+ ·434*	+ ·517	+ ·554	+ ·562*
Coal ...	1·55	78	70	63	A	,,	— ·279	— ·332	— ·360	+ ·470	+ 2.026	+ 2·650	+ 2·721
					B		Insufficient.				Insufficient.		
Coke ..	23·68	61	55	52	A	omitted	— ·040	— ·066	— ·093	+ ·084*	+ ·103	+ ·104	+ ·083*
					B	,,	— ·008	— ·053	— ·078	+ ·029*	+ ·048	+ ·039	+ ·018*
Clinkers ..	20·17	64	58	54	A	,,	— ·053	— ·109	— ·144	+ ·009*	+ ·013	+ ·009	— ·007*
					B	,,	— ·033	— ·054	— ·089	— ·006*	— ·002	— ·011	— ·027*

APPENDIX XI. Breeze Sample No. IX. (Ashes from Waterworks).

Fractions.	Percentage of original sample.	Fineness after crushing to pass $\frac{1}{20}''$ sieve. Residue per cent. on following sieves.			Cement Sample used.	PERCENTAGE EXPANSION OR CONTRACTION.							
						Air Bars.				Water Bars.			
		$\frac{1}{100}''$	$\frac{1}{78}''$	$\frac{1}{50}''$		1 day.	7 days.	28 days.	3 months.	1 day.	7 days.	28 days.	3 months.
Average ..	—	—	—	—	A	+ ·645	+ ·468	+ ·457	+ ·494	+ 2·200	broken at 2nd day.		
					B	+ 1·008*	+ ·879	+ ·834	+ ·849	+ 3·450*	broken 5th day (4th = + 5·06 %).		
Thro' $\frac{1}{10}''$ sieve	42·58	75	70	59	A	+ 1·354*	+ 1·196	+ 1·144	+ 1·181	+ 3·220*	broken 5th day (4th = + 4·19 %).		
					B	+ ·934*	+ ·848	+ ·824	+ ·838	broken 2nd day (about 10 %).			
Thro' $\frac{1}{4}''$ sieve	30·84	79	74	67	A	+ ·267	+ ·145	+ ·117	+ ·122	+ 1·980	broken 2nd day (about 4½ %).		
					B	+ .417	+ ·300	+ ·267	+ ·277	+ 1·710	broken 2nd day (2nd = + 3·32%).		
Coal ..	7·48	74	66	70	A	+ ·357*	+ ·139	— ·022	— ·054	+ 1·722*	+ 2·915	+ 4·211	+ 4·354
					B	+ ·217*	— ·018	— ·177	— ·199	+ 1·902*	+ 2·955	+ 4·351	+ 4·529
Coke	7·30	64	58	50	A	+ ·087*	+ ·054	+ ·012	+ ·001	+ .632*	+ ·640	+ ·640	+ ·634
					B	+ ·097*	+ ·057	+ ·022	+ ·010	+ ·267*	+ ·340	+ ·345	+ ·339
Clinkers ..	8·31	83	77	67	A	— ·003	— ·033	— ·063	— ·086	+ ·014	+ ·013	+ ·004	— ·001
					B	— ·003	— ·030	— ·053	— ·066	+ ·009	+ ·011	+ ·004	— ·001
Ash ..	1·44	71	66	56	A	·000	— ·045	— ·067	— ·079	+ ·012	+ ·022	+ ·025	+ ·020
					B	+ ·005	— ·045	— ·067	— ·079	+ .017	+ ·027	+ ·030	+ ·035
Stones ..	2·05	79	74	68	A	— ·003	— ·090	— ·168	— ·190	+ ·004	+ ·002	— ·005	— ·021
					B	— ·003	— ·023	— ·048	— ·060	+ ·004	+ ·002	— ·001	— ·016

+ Indicates Expansion. — Indicates Contraction. * = 2-day Measurements

APPENDIX XII. Breeze Sample X. (Rough Ashes from Electricity Works).

Fractions.	Percentage of original sample.	Fineness after crushing to pass $\frac{1}{20}''$ sieve Residue per cent on following sieves.			Cement Sample used.	PERCENTAGE EXPANSION OR CONTRACTION.							
						Air Bars.				Water Bars.			
		$\frac{1}{100}''$	$\frac{1}{78}''$	$\frac{1}{50}''$		1 day	7 days:	28 days.	3 months.	1 day.	7 days.	28 days.	3 months.
Average ..	—	—	—	—	A	+ ·019	— ·032	— ·032	— ·154	+ ·042	+ ·086	+ ·070	+ ·058
					B	+ ·009	— ·027	— ·057	— ·079	+ ·052	+ ·101	+ ·095	+ ·093
Thro. $\frac{1}{10}''$ sieve	14·4	73	65	53	A	+ ·029	— ·037	— ·122	— ·153	+ ·117	+ ·281	+ ·380	+ ·388
					B	+ ·024	— ·032	— ·072	— ·098	+ ·122	+ ·266	+ ·350	+ ·353
Thro. $\frac{1}{4}''$ sieve	29·24	83	78	71	A	+ ·017	— ·045	— ·065	— ·087	+ ·061	+ ·117	+ ·122	+ ·109
					B	+ ·032	— 015	— ·040	— ·067	+ ·071	+ ·122	+ ·117	+ ·109
Coal ..	4·36	76	68	56	A	+ ·012	— ·050	— ·130	— ·112	+ ·016	+ ·017	+ ·007	+ 009
					B	— ·007	— ·050	— ·075	— ·082	+ ·041	+ ·052	+ ·047	+ ·039
Coke ...	5·72	55	51	45	A	— ·002	— ·035	— ·100	— ·122	+ ·016	+ ·012	+ ·007	— ·005
					B	— ·007	— ·055	— ·095	— ·117	+ ·036	+ ·047	+ ·033	+ ·019
Clinkers ..	43·47	83	80	73	A	+ ·007	— ·028	— ·063	— ·082	+ ·015	+ ·018	+ ·002	— ·002
					B	+ ·002	— ·023	— ·058	— ·067	+ ·020	+ ·013	+ ·007	+ ·001
Stones ..	2·81	79	72	60	A	+ ·012	— ·032	— ·073	— ·092	+ ·070	+ ·143	+ ·212	+ ·196
					B	+ ·002	— ·047	— ·088	— ·102	+ ·065	+ ·078	+ ·152	+ ·150

+ Indicates Expansion. — Indicates Contraction.

APPENDIX XIII. **Breeze Samples. Bars gauged with Cement A, left in air and subsequently immersed in water.**

Breeze Sample.	Fraction.	Immersed in days after Gauging.	Percentage Expansion after Immersion.			
			1 day	7 days.	28 days.	3 months.
No. I. (Fine pan breeze.)	Average ..	292 days	·015	·020	·025	·035
	Thro. $\frac{1}{10}$″ sieve	288 ,,	·015	·017	·022	·035
	Thro. $\frac{1}{4}$″ sieve	287 ,,	·012	·020	·025	·035
	Coke ..	279 ,,	·015	·017	·032	·040
	Clinkers ..	286 ,,	·012	·012	·017	·022
No. II. (Coarse pan breeze.)	Average ..	278 ,,	·015	·017	·022	·042
	Coke ..	274 ,,	·022	·020	·025	·045
	Clinkers ..	278 ,,	·012	·015	·015	·032
No. III. (Coke breeze.)	Average ..	273 ,,	·065	·077	·097	·102
	Thro. $\frac{1}{4}$″ sieve	272 ,,	·080	·087	·107	·112
	Coal ..	267 ,,	·077	·092	·127	·127
	Coke ..	272 ,,	·065	·075	·085	·090
	Clinkers ..	267 ,,	·065	·077	·092	·110
No. IV. (Furnace ashes.)	Average ..	267 ,,	·017	·022	·030	·037
	Thro. $\frac{1}{10}$″ sieve	266 ,,	·020	·025	·030	·037
	Thro. $\frac{1}{4}$″ sieve	265 ,,	·022	·025	·030	·040
	Coke ..	266 ,,	·035	·020	·035	·057
	Clinkers ..	266 ,,	·027	·012	·022	·037
No. V. (Gas works clinkers.)	Clinkers .. (only)	264 ,,	·017	·015	·020	·015
		*264 ,,	·040	·050	·020	·015
No. VI. (Ashes or furnace refuse.)	Average ..	194 ,,	·030	·020	·010	·047
	Thro. $\frac{1}{10}$″ sieve	189 ,,	·020	·015	·025	·032
	Thro. $\frac{1}{4}$″ sieve	189 ,,	·017	·015	·017	·020
	Coke ..	188 ,,	·017	·017	·017	·020
	Clinkers ..	187 ,,	·015	·010	·007	·020
No. VII. (Ashes or furnace refuse.)	Average ..	194 ,,	·035	·045	·042	·035
	Thro. $\frac{1}{10}$″ sieve	187 ,,	·037	·045	·045	·052
	Thro. $\frac{1}{4}$″ sieve	187 ,,	·037	·042	.042	·057
	Coal ..	131 ,,	·065	·077	·082	·092
	Coke ..	131 ,,	·025	·025	·017	·030
	Clinkers ..	131 ,,	·017	·010	·010	·020
No. VIII. (Coal ash from paper mills.)	Average ..	128 ,,	·025	·035	·037	·047
	Thro. $\frac{1}{10}$″ sieve	128 ,,	·027	·035	·035	·052
	Thro. $\frac{1}{4}$″ sieve	128 ,,	·040	·057	·077	·075
	Coal ..	103 ,,	·570	·995	1·982	2·910
	Coke ..	127 ,,	·035	·040	·042	·052
	Clinkers ..	127 ,,	·015	·010	·002	·005
No. IX. (Ashes from waterworks.)	Average ..	114 ,,	·222	·510	·765	·825
	Thro. $\frac{1}{10}$″ sieve	110 ,,	·235	·517	·740	·827
	Thro. $\frac{1}{4}$″ sieve	104 ,,	·215	·625	1·657	2·160
	Coal ..	103 ,,	·715	1·325	2·695	4·170†
	Coke ..	103 ,,	·045	·055	·055	·060
	Clinkers ..	99 ,,	·012	·017	·010	015
	Ash ..	98 ,,	·025	·027	·027	·032
	Stones ..	99 ,,	·012	·015	·012	·012
No. X. (Rough ashes from electricity works.)	Average ..	93 ,,	·020	·027	·025	·032
	Thro. $\frac{1}{10}$″ sieve	93 ,,	·040	·045	·050	·062
	Thro. $\frac{1}{4}$″ sieve	91 ,,	·027	·035	·030	·035
	Coal ..	91 ,,	·052	·062	·060	·067
	Coke ..	91 ,,	·042	·045	·037	·045
	Clinkers ..	126 ,,	·004	·014	·027	·030
	Stones ..	126 ,,	·012	·014	·017	·048

* Breeze gauged with Cement B. † 2 months expansion, bar broken.

each series was therefore placed under water, the time elapsing between the date of moulding and placing under water ranging from 91 to 292 days. The results are given in appendix XIII. It will be observed that immersion had practically no effect upon those specimens which had previously shown no expansion when kept under water, but that it caused almost immediate expansion of a very serious nature with those fractions of breeze which had previously developed expansion when placed under water in the first instance. This clearly shows that the expansive agent, whatever it may be, is more or less dormant in the dry air-set block, and only requires to become damped to constitute a serious element of danger.

Referring now to the chemical aspect of the question, it was intended, when the experiments were first commenced, not only to analyse each fraction of each sample, to ascertain if it contained any deleterious constituent, but also to analyse each mortar both immediately after gauging, and again at the end of the experiments, to try and ascertain, if and when any expansion had occurred, whether there was any marked chemical difference between them, which would enable the cause of the expansion to be detected, and thus serve as a guide in the investigation of actual cases of failure. After analysing some thirty-six samples with entirely negative results, this idea was abandoned as involving too prodigious an amount of labour without any likelihood of corresponding reward; seeing, however, that some of the coal fractions caused enormous expansion while others caused practically none, they were examined chemically with the view of ascertaining the cause of this marked difference. The results showed that the coals from breeze samples Nos. 8 and 9 were highly bituminous, containing 35 per cent. and 33½ per cent. respectively of volatile matter, while those from samples Nos. 7 and 10 were more of the nature of anthracite, containing only 4 per cent. and 3 per cent. respectively of volatile matter. This indicates very clearly that bituminous coal is highly dangerous, while anthracite appears to be harmless. Apart from coal, the only analysis of the other fractions calling for comment is the fine material passing the 1-10in. sieve of sample 9, which was found to contain 3¾ per cent. of SO , which is doubtless partially responsible for the high expansion shown by this fraction, aggravated no doubt by the presence of some fine coal.

Taken as a whole, the experiments as far as they go seem to point to the fact that as regards subsequent expansion, there is not much danger to be apprehended from good clean coke or clinkers, or even anthracite coal, but that some kinds of ashes and furnace refuse are highly dangerous, while any considerable quantity of bituminous coal is absolutely fatal. One noticeable feature of the experiments, however, was, that most of the coke breeze mortars, had a tendency to more or less seriously attack the iron moulds in which the Bauschinger Bars were made, causing them to rust during the short space of twenty-four hours between the moulding of the specimens, and their removal from the moulds; the author is unaware if such results have been found to any appreciable extent in actual practice, but samples of breeze concrete sent him for examination a short time ago, showed distinct marks of considerable rusting having taken place where the concrete had been in contact with the rolled joists. If such prove to be the case, it might in the end prove a very serious matter as affecting the life and strength of the steel work.

Altogether the experiments previously described represent some two years' work, and include the preparation of about 300 test pieces involving some 5,000 measurements, to say nothing of the sifting, sorting, and preparation of the breeze samples; the author is only too conscious of the fact that they are far from reaching finality, indeed, they only touch the fringe of a wide field of research in which there is a vast amount of work to be done; having ascertained, however, that certain materials constitute a serious source of danger, and probably account for many of the "Breeze" concrete failures which he has met with, he trusts that the danger signals most unmistakably displayed by the foregoing researches may prove of value to his hearers and tend to prevent the recurrence of such failures in the future.

Since the inception of these experiments, the following translated extract from the "Tonindustrie-Zeitung," dated April 25th, 1908, shows that the importance of the subject has at all events begun to be appreciated in Germany.

"Use of Coal Residues for Concrete."

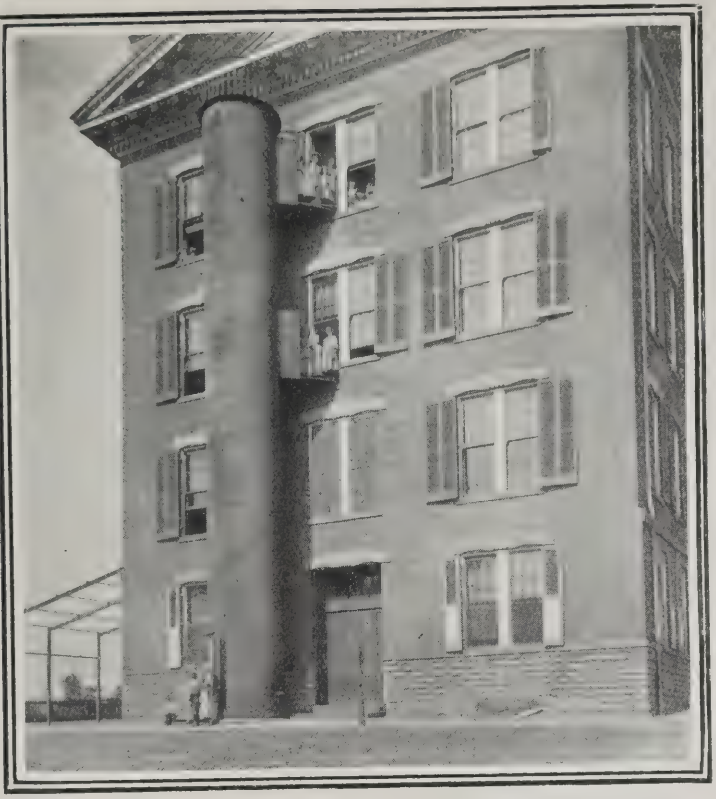
"The Minister for Public Works has on the 25th March, 1908, issued the following circular addressed to the Departmental Presidents of the Government:—

"After having received the report of the German Board of reinforced concrete, I recommend the prohibition of the use of breeze as an aggregate for concrete for the erection of reinforced concrete buildings in general, also in ceilings and beams wherever tensile stresses may occur. The use of breeze for other kinds of concrete. will only be admitted in such cases where there is no danger of its coming into contact with the supporting ironwork, nor of people being hurt by the falling concrete."

In conclusion, the author wishes to thank those firms who kindly supplied him with the various samples of breeze experimented upon; his thanks are also due to his two assistants, Messrs. G. J. Fenwick, A.R.C.S., and A. T. Faircloth, for the careful and painstaking manner in which they carried out the experiments under his direction.

Discussion.

Mr. Henry Adams, in proposing a vote of thanks to Mr. Butler, said there were points in his paper which might be open to discussion. He had spoken of the expansion of the mass of concrete, which in itself was a very serious matter. When a large warehouse floor was laid in concrete the expansion in many cases had been very serious, and was not altogether prevented by the use of expansion boards. The mischief, Mr. Butler had told them, was undoubtedly due in most cases to the coke breeze. They were apparently using a combustible material and expecting it to resist fire, but the result of the experiments formulated by their Chairman (Mr. Marsland) was of course sufficient



THE NEW AMERICAN FIRE ESCAPE.

The curious and ugly automatic fire escape shown above is being applied to all school buildings in America. Pupils enter the escape from each floor and slide down the interior by means of a spiral chute. Some of them are seen emerging at the bottom. It was after the recent terrible fire at Collinswoods school near Cleveland, Ohio, that these fire escapes were ordered to be placed upon all schools,

authority for their acceptance. Whether they were made under practical conditions he did not know. The lecturer had cited a case where coke breeze had been used in concrete for a boiler setting and had stated that it actually took fire. Until he saw the enlarged diagram, he was not clear as to what was meant by the lecturer's reference to his fractions of "breeze." It appeared that samples of breeze were divided up into certain portions, one consisting of coal only, and in order that they might be properly tested, a portion of the material was passed through a ¼in. sieve, and another a 1-10in. sieve. The lecturer had also said that the results of the tests of the concrete bars under water showed expansion to be negligible, while those kept entirely in air showed slight contraction, and with that in view one would expect fireproof floors to show contraction rather than expansion. He would be interested in knowing whether there was any reason why floors should show expansion rather than contraction when the small tests showed the opposite. He also heard that a fireproof floor at any time would be subject to expansion if it got moist, it remaining constant until moisture reached it. He would like to know whether it would contract again when the moisture had evaporated. Regarding the lecturer's remarks on Breeze Sample No. VIII., where he said that about 43 per cent. passed through a 1-10in. sieve and 12 per cent. through a ¼in. sieve, he took it to mean 12 per cent. of the original bulk was retained after the 43 per cent. had passed through the 1-10in. sieve. The author had told them that "the expansive agent, whatever it might be, was more or less dormant in the dry air-set block, and only required to become damped to constitute a serious element of danger." That was a very important point as regards failures, because it might be due to a leaky tank or something of that kind causing expansion. Another important point was the tendency of coke breeze mortar to cause rusting of the iron moulds, a point which should be taken into account when using metal as a reinforcement. The corrosion of the metal in the concrete was one of the questions under special consideration by the Concrete Institute.

Mr. Edwin J. Sadgrove, F.R.I.B.A., said he had given up using that particular aggregate after witnessing an incident in which the workmen engaged on some work having nothing wherewith to cook their food, obtained a piece of so-called "fireproof flooring," lit their fires and cooked their dinners with it. He had always thought that coke breeze was hungry enough to take anything, and a mixture of 1.3 was, he thought, hardly sufficient. With more cement than coke breeze they might get the stuff to hold together, and he associated himself with the German Minister for Public Works, who, after having "coke breeze" before him as a prisoner, and hearing all the expert evidence for and against, found it "guilty" with no recommendation to mercy. He supposed coke breeze was really only seriously thought of when lightness of construction was necessary, and he could not see why they could not use some other light material for concrete.

Mr. H. K. G. Bamber regretted that, although Mr. Butler had given them instances of failure under his series of tests, he had not given them any opinion as to the cause of those failures. He could quite understand the great difficulty in formulating any theory as to what chemical action might have taken place between the breeze and the cement, but he was inclined to believe that the cause of expansion was probably due to the presence of sulphur in the form of sulphides. In the analysis given the lecturer said that the breeze contained 3¾ per cent. of sulphuric anhydride; he thought that in all probability the sulphur was not present in the form of an anhydride, but probably in combination with other metals in the form of a sulphide, and being in that unstable condition was the direct cause of the expansion. Any compound in cement, or in the aggregate used in cement, which was of such unstable character and liable to oxidation, forming various compounds with the other ingredients present, was a very undesirable thing to be there. He also thought that the presence of sulphides was borne out by Mr. Butler's statement that the breeze concrete showed a "tendency to more or less seriously attack the iron moulds in which the Bauschinger bars were made;" this, he thought, was distinct evidence of the presence of an unstable compound which had started some action after the cement had set.

Mr. Max Clarke, F.R.I.B.A., said he was one of those unfortunate people who had had considerable failures with coke breeze concrete, and he had tried to find out the cause. He made investigations at a gas works as to the difference between "Pan" breeze and "Coke" breeze, a matter which many architects did not know. "Pan" breeze was the material which fell into the water pan from the furnace, while "coke" breeze was the refuse which was drawn from the retort after the gas was extracted. He had a sample of each analysed, with the result that it was evident that both contained an appreciable amount of sulphur, pan breeze being the worst, and that the samples were unsuitable as aggregates for concrete. Since then he had avoided "coke" breeze. He did not agree that breeze concrete was inflammable; he was almost certain that it was not. He possessed a sample of coke breeze concrete which had been experimented upon by the British Fire Prevention Committee. This particular piece was underneath an iron joist, and about 2in. thick. It was subjected to more than 1,500 degrees Fahrenheit, and on the side which was in contact with the joist was a piece of coal, which was not in the slightest degree burnt. They found that coke breeze floors became incandescent on the under side, but they did not show the slightest tendency to burn or to flame, and when broken down, the concrete in the centre was just as good as when put up. In his opinion it was sulphur which caused these expansions; in fact he thought he saw along the edge of the cracks in the concrete bars shown on the screen, certain marks denoting the presence of sulphur. Mr. Butler had said that the expansion shown on some of the diagrams was negligible; but supposing they had a warehouse 100ft. long and the coke breeze was to expand one per cent., it would hardly do to have an expansion of a foot. The danger would then be considerable, and even if the expansion was 1-10 per cent., it would cause serious damage. The speaker exhibited drawings showing a coke breeze roof over a small strong room. The dimensions of the building were—length 19ft., average width 6ft., and the coke breeze roof 14in. thick. All round between the coke breeze and the wall was a 1¼in. space. The walls were built of 14in. brickwork, with two courses of hoop-iron at every joint, so that they were practically stable. At the end of about nine months, at the weaker end of the building, the walls on both sides cracked to the extent of ¾in. from top to bottom. These cracks were cut out and repaired, but after another period again opened out about half-an-inch. Of course, one per cent. expansion would do such things as that. Another case was that of a large warehouse about 150ft. long, 60ft. wide, and one storey high, where the owners wished to insert a floor about 10ft. from the ground. There were rows of stanchions put up and longitudinal joists. The coke breeze floor was isolated on two sides and one end projected from the building. It was exactly 60ft. long when put up, and four months afterwards it was 60ft. 4in., and they could see on the under side where the cross joist had originally been at the free end. He had put in coke breeze floors 150ft. long more than once, and although they had been up from ten to fourteen years, the buildings did not show any cracks, but he would point out that none of the buildings had concrete roofs. Damp was a great factor in causing these cracks. Porches and such like cracked very badly indeed from that cause. He always had his cement tested, and endeavoured to get what he called "pure" coke breeze, although he felt it was practically an impossibility. If they could have the coke breeze broken up and washed, they would have more exactly the stuff that they wanted. The material which came from the retort cost about 4s. 3d. a cubic yard, that from the pan about 2s. 3d. a yard, and if they added to that the cost of breaking and washing, then coke breeze would be out of court. They only used it because it was light.

Mr. Chas. F. Marsh suggested that instead of coke breeze, "destructive clinker" should be tried. It would, he thought, be free from some of the disadvantages of coke breeze. He had always known that concrete when it sets in air contracts, and when it sets in water expands, and had frequently heard architects complain of the expansion of floors, but he supposed that they were generally, in fact probably always, made of breeze and not of the other aggregates.

Mr. H. E. Hawker had had a good deal of experience in putting down concrete floors and roofs, and his trouble had not been caused by expansion but by contraction, and he found that floors and roofs went on all right for four or five months, when they suddenly developed a crack. He had, however, overcome his difficulties by reinforcement either with wire or expanded metal. He was not scientific enough to explain why that should be so.

Mr. G. L. Anderson submitted the result of the Associated Portland Cement Manufacturers' tests, showing the relative tensile strength of mortars made with same cement, but using various sands and aggregates. The same proportions were used in each case, viz. :—1 part of Portland cement by weight to 3 parts of aggregate. The following suitable and unsuitable aggregates were used in the tests, and taking the three months old tests as corresponding with Mr. Butler's figures, the relative tensile strengths were as follows :—

With *suitable* aggregates :—

	Tensile Strength.
Standard Leighton Buzzard sand	555 lb. to the sq. in.
Crushed granite	650 ,, ,,
Fine silver sand	442 ,, ,,
Average building	405 ,, ,,

With *unsuitable* aggregates :—

Earthy sand (25% of soil) ..	230 ,, ,,
Loamy soil	260 ,, ,,
Breeze, containing sulphides	Test pieces disintegrated completely.

He mentioned these figures as bearing upon the question of the sulphur content of the breeze being possibly the explanation of the failures referred to, but, whatever the cause, it certainly was expedient for all those who were dealing with reinforced concrete work to avoid breeze or slag which had any suspicion of a high sulphur content

Mr. R. B. Ling said some reference had been made to the use of destructive clinkers in concrete, but from his personal experience he had found the material unsuitable. The clinkers contained bits of leather and animal matter which did not properly burn, and after a few months these foreign matters caused "blowing" and cracking.

Mr. Ellis Marsland said the whole question seemed to turn on the moral that when they specified coke breeze they should see that they got it. The diagrams showing the result of experiments dealt with what could hardly be called "breeze." His definition of breeze would be the refuse of small coke, and it was those other materials imported as breeze which caused all the trouble. Some remarks had been made with regard to coke breeze not being a good fire-resistant, and an instance given of a man who set his boiler upon coke breeze blocks. The latter was, of course, a very foolish thing to do, for if the boiler had been set on any other concrete the result would have been just the same. He thought it would be a very useful thing if they could have some experiments made with larger samples, not altogether laboratory tests, but practical tests, with say a block a yard long and six inches square, then he thought they would arrive at a more practical result. The idea that coke breeze was not a suitable material for fireproof floors was quite erroneous. The hut used by the Fire Prevention Committee in carrying out their tests had a roofing of coke breeze concrete which had been subjected to from 1,800 to 2,000 degrees of heat for from two to four hours, with the temperature alternating, and was as good now as when first put up. The under surface, he admitted, was often incandescent, but that was no indication that coke breeze was not fire-resisting. Any other concrete tried in their tests had always been incandescent at the conclusion of the test.

Mr. D. B. Butler in acknowledging the vote said that with regard to Professor Adams' remarks, the samples of breeze in a great many cases consisted of fine and coarse particles, ranging from 2in. in diameter down to 100th part of an inch, and since it was impossible to hand pick such very fine material, he took that stopping in the ¼in. sieve as the finest which could profitably be sorted out. The material going through this sieve he again differentiated somewhat by passing it through a 1-10in. sieve. That retained on the ¼in. sieve was all hand picked as stated. Floors which expanded with moisture would not, he thought, contract again when the moisture had evaporated, his experiments showing that the expansion took place within the first week or so and remained permanent. With regard to the rusting of the iron bars used as reinforcement with coke breeze, he had heard of cases where coke breeze concrete was used for enclosing iron water pipes and considerable rusting had occurred. With regard to Mr. Anderson's remarks as to the different strengths of mortars composed of desirable and undesirable sands, it was very unfortunate that Mr. Anderson could not give them some idea of the amount of sulphur in the breeze he used. He thought that when they specified coke breeze they should see that they got it, and the proper definition of breeze was "fine coke."

Federation News.

PRESTON ASSOCIATION.

Secretary: John Tomlison.

The half-yearly general meeting of the Preston Association was held at the Board-room, in the new premises, Mount Street, Preston, when the president (Mr. T. B. Garnett) was in the chair, and there was an attendance of about ninety members.

The minutes of the last meeting having been read and approved, the chairman called attention to the half-yearly report, which spoke of the continued progress and success of the society, and detailed at some length the work of the past six months.

The representatives of the Executive and Trade Committees of the County Federation were then appointed, and also the representatives on the Local Conciliation Board.

The proposal to appoint a solicitor to the association was next considered, and the committee's report on the subject was read. Three names were submitted to the meeting, and a ballot taken, with the result that further negotiations with the selected gentlemen were left in the hands of the committee.

It was decided that the association cease paying the expenses of Federation officials or delegates to National and other meetings after September 30th next, unless and when they are specifically elected to represent this association, or the committee by special resolution agree to pay such expenses.

A proposal that in future the representatives on the local committee shall be nominated by the branch trades was defeated, and an amendment carried leaving the election of the representatives in the hands of the branch trades.

It was also decided to print the Federation rule on the subject of arbitration between sole and sub-contractors in cases of business disputes as a local rule, and to register the new premises as a club.

This completed the formal business.

During the past month or two, the question of a uniform discount to members on goods supplied to private parties, etc., that members have to fix, has been dealt with by the plumbers' and painters' branch, and the subject is still under consideration.

The General Committee have had under consideration the desirability of amending the National form of contract, and have submitted their proposals, which were of a somewhat comprehensive character, to the Federation.

BARNSLEY ASSOCIATION.

Secretary: J. Denton.

At the monthly meeting (May) of the Barnsley Branch of the Federation of Building Trade Employers, which was held at the King's Head Hotel, the president (Councillor G. Haigh) was supported by fifteen members.

The branch was further strengthened by the unanimous election of two new members in the Plumbers' Section.

The report of the last Yorkshire meeting was submitted by the senior vice-president (Mr. E. Broley). The new sub-contract form of agreement, as amended at the Yorkshire monthly meeting held in Dewsbury, received unanimous approval.

It was resolved that the annual drive and cricket match, "Builders' Section" versus "Rest of Federation," be held in June. The "Whist Drive" balance sheet was submitted by the secretary, and unanimously approved.

The election of the employers' representatives on the Local Conciliation Board resulted in the following gentlemen being unanimously elected, viz.: Messrs. Councillor G. Haigh, C. D. Potter, H. Medley, C. W. Squire, P. Dalby, T. Lindley, J. Smith, and F. Goodyear.

WAREHOUSE, ORMEAU ROAD, BELFAST.

PATENT VULCANITE ROOFING

FIRE RESISTING.

The best covering for FLAT ROOFS of wood or concrete construction.

Complies with the London Building Act and Local Regulations.

No expense of maintenance. Guaranteed for long periods.

SPECIFIED BY LEADING ARCHITECTS AND ENGINEERS.

Tested by the British Fire Prevention Committee.

Also Manufacturers of Asphalte and Bitumen Dampcourses and various classes of Sheetings for light Roofs. Samples free.

For Full Particulars, Catalogues, Detailed Sketches, and Estimates, apply to

VULCANITE, LIMITED,

London Offices: 118, Cannon Street, London, E.C. And at Belfast and Manchester.

From North of England, Scotland, and Ireland, please address to Belfast.

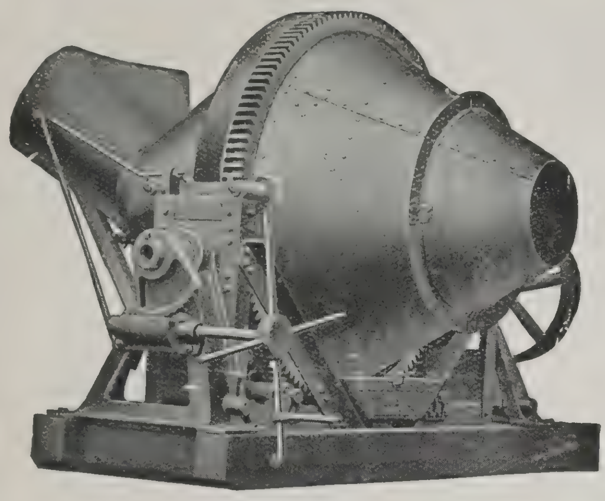


Fig. 982.

Smith Patent Mixer.

The best Mixer for **CONCRETE** or any Material.

The most efficient and quickest working batch Mixer on the Market. . . . . . .

Excellent reports from Users. . . .

NEARLY 3,000 NOW IN USE.

Sole Makers for the United Kingdom and Colonies:

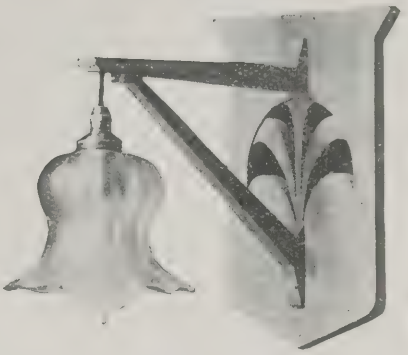
STOTHERT & PITT, Ltd., BATH.

ELECTRIC LIGHTING

Heating,
Bells,
Telephones.

FITTINGS.

Estimates Free.



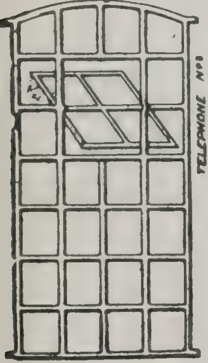
A "Tredegar" Bracket.

Specialists in Temporary Electric Lighting and Power during construction of Buildings. ∴ We installed and maintained Electric Lighting and Power during the construction of the Baker Street & Waterloo Railway, the Piccadilly Hotel, etc.

TREDEGAR & CO.

HEAD OFFICE—56, Victoria Street, London, S.W.
BRANCH—St. Albans.
WORKS—Tredegar Works, Bow, E.

Telephone: WESTMINSTER 5907.



PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART

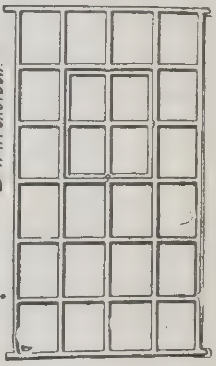
TELEPHONE No 8492 Central

MEASURES BROS LTD 53B SOUTHWARK ST LONDON. S.E. & PITLAKE, CROYDON.

TELEPHONE No 171 CROYDON.

10,500 TONS OF SIEMENS MARTIN **ENGLISH**
& BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.
SECTION SHEETS, BOOKS & PRICES ON APPLICATION.
CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.

STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock.



TANK ROOF TO FACTORY 190 ft. by 57 ft.

The Chain Concrete Syndicate.

Constructional Engineers in Reinforced . . Concrete. . .

The most complete system in existence.
Every Member, Tension or Shear, RIGIDLY FIXED.
No Loose Bars to be misplaced during Concreting.

Fireproof Floors, Flat Roofs, Reservoirs, Culverts, Bridges, etc.

Write for Pamphlet—

1, Basinghall Square, LEEDS, and Carlton Street, CASTLEFORD.

Publisher's Notices.

Offices: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address: "Buildable, London."

Telephones: ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted.

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - - -	6d.
Three insertions* - - - - -	3s. 0d.

* This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER, S.W

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aylesbury.—For enlargement of the Aylesbury Council Schools, for the Bucks County Education Committee:—

H. J. and A. Wright, Great Missenden	£5,260
S. Mayne and Son, Aylesbury	4,865
T. and G. Cannon, Aylesbury	4,675
J. Mead, Chesham	4,497
G. Tombs and Sons, Buckingham	4,415
G. Darlington, Amersham	4,348
Hacksley Bros., Wellingborough	4,328
G. H. Gibson and Sons, High Wycombe	4,283
J. T. Harris, High Wycombe	4,269
H. Flint, High Wycombe	4,187
Webster and Cannon,* Aylesbury	4,088

*Recommended for acceptance. Subject to the consents of the County Council and the Local Government Board to the raising of the necessary loan and to the execution of a satisfactory agreement and bond.

Davenham (Cheshire).—For additions and alterations to schools, for the managers of Davenham C.E. School. Mr. A. E. Powles, architect, 7, Winnington Street, Northwich. Quantities by Mr. E. J. Muspratt:—

	£	s.	d.
T. Leicester	£1,499	0	0
S. A. Whitehead	1,485	12	0
Dickenson and Noden	1,440	0	0
Birchall Bros.	1,376	10	0
S. Appleton	1,375	0	0
J. Molyneux	1,355	0	0
W. Forster	1,350	0	0
E. W. Bostock	1,342	0	0
W. Wood	1,290	0	0
E. Curzon	1,289	12	6
Exors. of H. Sergeant	1,269	0	0
T. Astles	1,250	0	0
P. Taylor and Sons,* Northwich	1,233	0	0

*Accepted.

Derby.—For erection of extensions to the Derby Borough Asylum. Mr. B. S. Jacobs, F.R.I.B.A., Lincoln's Inn Buildings, Bowlalley Lane, Hull, and Messrs. Thorpe and Fryer, architects, Derby:—

	£	s.	d.
Bowman and Son, Stamford	£12,819	0	0
J. Wilson and Son, Birmingham	12,289	15	3
Moss and Son, Loughborough	12,180	0	0
D. Gill and Son, Doncaster	11,795	18	5
G. H. Fenwick, Hull	11,791	18	0
Quibell, Son, and Greenwood, Hull	11,779	10	0
Radford and Greaves, Derby	11,704	0	5
R. Kershaw, Burton	11,700	8	8
W. Wood, Derby	11,669	10	9
T. Lowe and Son, Burton	11,646	0	0
W. Ford and Son, Derby	11,627	6	9
Pegg and Bailey, Derby	11,547	8	0
E. Morley and Son, Derby	11,395	0	0
J. Byron, Ltd., Bury	11,363	0	0
J. Dickenson, Derby	11,188	0	0
W. Pattinson and Sons, Ruskington	11,172	0	0
J. and J. Warner,* Mickleover, near Derby	10,855	11	3

Architects' estimate, £11,800.

*Accepted.

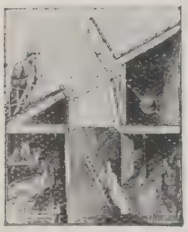
London.—For the erection of additional offices for the Royal London Mutual Insurance Society, in Finsbury Square. Mr. John Belcher, R.A., architect.

Chas. Wall	£27,307
Holland and Hannen	25,954
Foster and Dicksee	25,605
Cubitt	25,525
Trollope and Colls	24,994
E. Lawrance and Sons	24,601
Higgs and Hill	24,594
J. Carmichael	24,569
Waring White Building Co.	24,569
Prestige and Co.	24,554
Kerridge and Shaw	24,473
H. L. Holloway	24,368
W. Downs	24,150
H. and H. F. Higgs	23,933
Howell J. Williams, Ltd.	23,900
Simpson and Sons	23,881
W. Lawrance	23,862
Holloway Bros.	23,500
Godson and Sons	23,442
Spencer, Santo and Co.	23,359

(*Tenders continued on page viii.*)

ROOFING SLATES.
Velinhell, Penrhyn and Westmoreland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

THE BAFECO PATENT
AUTOMATIC
TRAP-DOOR FIRE ESCAPE.
BURGLAR PROOF.



FIRE DOWNSTAIRS
Escaping to the Roof

SIMPLE.
CHEAP.
EFFICIENT.
Easily Fixed
A child can operate it.
A 'Bafeco' Roof-Escape safeguards at a trifling cost the lives of a whole household against Fire.
Full particulars and prices from
THE BUILDING ACTS FIRE ESCAPE CO.,
4, Southampton Row, W.C.
Telephone 2366 CENTRAL.

"THE" LIFT & HOIST CO.,
Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs.
Premier Ironworks,
DEPTFORD, S.E.

WRITE TO THE MANUFACTURERS.
BAYLISS, JONES & BAYLISS, LTD.

WOLVERHAMPTON & LONDON.
LOW PRICES. CATALOGUES FREE. (NAME THIS JOURNAL.)

NOSTELL BRICK AND TILE WORKS,
MANUFACTURERS OF NR. WAKEFIELD.
TERRA COTTA in BUFF, RED, &c.
ROOFING AND FLOORING TILES.
Tel. Address: "WINN NOSTELL"
Tel. No. 66, WAKEFIELD.
Representative: FRANK TALBOT, West Leigh, Walton, near Wakefield.

CLARK & CO., 32a, Westminster Palace Gardens, S.W.
The Most Perfect Substitute for Keene's
at almost the price of Lime
ONE material only required for both render and finish
A Perfectly Sanitary Fireproof Cement
PLASTER Telegrams: "CLARCOLITE, LONDON."
Telephone: 5321 WESTMINSTER.
Works: Newark-on-Trent, G.N.R.

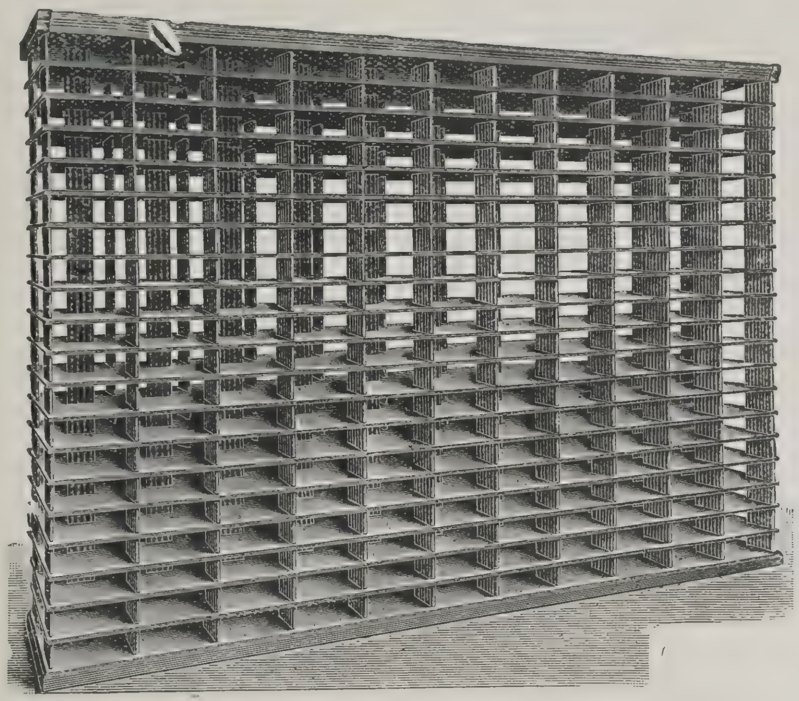
FOLDING PARTITIONS.
REVOLVING SHUTTERS.
Hartley Bros.
2/- ft. Super.
1/- ft. Super.
GORTON,
MANCHESTER.

Telegraphic Address:
"METCONSTRU, LONDON."

Telephone:
15290 CENTRAL.

THE ADJUSTABLE SHELVING AND METAL CONSTRUCTION

COMPANY, LIMITED.



PATENT COLLAPSIBLE DOUBLE-SIDED STORAGE STACK.

This stack contains 20 shelves of steel about 1/25th of an inch in thickness instead of 5/8th of an inch, which would be necessary if wood were used. The saving in space is therefore as follows:

$117/200 \times 20 \times 11 \times 2 = 21$ ft. 5 in.

which is about equal to another 60 divisions.

Manufacturers of

Patent Steel Constructional Work,

AND

Steel or Wood Fittings,

For Stores, Warehouses, Libraries, etc.,

WITH

Fixed or Adjustable Shelving

(Patented all over the world).

Leading Features of our Adjustable Shelving.

Easy and rapid adjusting of the shelves, even when fully loaded.

Greatest economy of space, the usual supports being dispensed with, the sideplates only require sufficient clearance to prevent chafing.

Free access of air and light, owing to the absence of the usual partitions. No corners where dust can collect. Pleasing appearance.

Contents visible at a glance. Erection and dismantling perfectly simple, only a spanner and screwdriver required.

Interchangeability of all parts. Great saving in time and cost, when removal is necessary.

Our stacks are suitable for Shops, Warehouses, etc., as well as Libraries, Archives, etc.

Complete Space-Saving installations for Libraries, both Public and Private, Government and Insurance Offices, Banks, etc.; Museums, Collections, etc.; Shops, Warehouses, Showrooms and Book Stores, Business Houses and Factories.

OFFICES AND SHOWROOMS:

40, Gwydir Chambers, High Holborn, London, W.C.

Works: The Willesden Metal Works, Willesden Junction, London, N.W.

A Splendidly Illustrated 64 pp. Catalogue sent Free on Application.

Designs, Plans and Estimates Free of Charge.

Tenders continued from page vi.)

Cambridge.—For house on Lathom Road, Cambridge. Mr. A. P. MacAlister, F.R.I.B.A., architect, 20, St. Andrew's Street, Cambridge. Quantities by the architect:—

Bell and Sons	£2,137	0	0
Rands and Sons, Wisbech	2,075	0	0
Willmott and Sons	2,050	0	0
Coulson and Lofts	2,020	0	0
Kerridge and Shaw	1,993	0	0
Negus and Son	1,987	0	0
Shanks, Chatteris	1,935	0	0
H. B. Ambrose*	1,993	7	0

***Accepted**
Rest of Cambridge.

Cheshunt (Herts.).—For alterations and additions to Bishop's College, for the Committee. Mr. A. Blomfield Jackson, F.R.I.B.A., architect, 3, New Square, Lincoln's Inn, W.C.:—

Sheppard Bros.	£4,559 16	0	0
R. Archer	3,960	0	0
J. Chessum and Sons	3,610	0	0
A. Fairhead and Son	3,599	0	0
J. A. Hunt	3,498	0	0
Holliday and Greenwood, Ltd.,* London	3,488	0	0

***Accepted.**

Crowcombe (Somerset).—For erection of a detached residence of the Crowcombe Heathfield Estate, for Mr. G. R. Cover. Mr. F. W. Roberts, F.R.I.B.A., 2, Hammel Street, Taunton. Quantities by the architect:—

W. J. Bloxham	£2,016	10	0
Pittard and Son	1,858	10	0
J. E. Furseland	1,850	0	0
A. J. Spiller	1,820	0	0
F. Small	1,788	0	0
H. J. Spiller and Son,* Taunton	1,780	0	0
F. J. Manning and Son	1,743	0	0
Moggridge and Son	1,719	0	0
Pollard and Co.	1,717	9	4
F. Parker and Son	1,645	0	0

***Accepted.**

Devonport.—For erection of Sunday-school at St. Mark's Church, Ford. Messrs. Hine, Odgers, and May, architects, 23, Lockyer Street, Plymouth:—

Roach and Lovell	£1,127	0	0
W. E. Blake	1,108	12	6
A. Andrews	1,065	0	0
H. J. Allen	1,046	13	0
J. Paynster	1,021	0	0
J. B. Turpin	984	0	0
Pearn Bros.	979	0	0
S. Roberts, Ltd.	978	19	0
F. Stanbury,* Devonport	970	16	8

Note —Exclusive of internal plastering to walls.
*Accepted.

Exeter. — For erection of new Sunday-school buildings, St. Thomas, for the trustees of Wesleyan Methodist extension. Mr. Harbottle Reed, F.R.I.B.A., architect:—

Dart and Francis	£2,097	0	0
G. Lamacraft and Sons	2,083	2	0
H. Pittard and Son	1,939	0	0
R. Wilkins and Sons	1,845	0	0
Ham and Passmore	1,738	0	0
T. Vaughan	1,735	16	0
W. Brealy	1,723	0	0
M. T. Sleeman	1,718	8	9
S. Roberts, Ltd.	1,701	14	7
T. Triggs	1,696	7	0
Westcoll, Austin and White	1,650	0	0
W. Harvey	1,635	0	0
Baker Bros.,* Exeter	1,572	9	10

*Accepted.

Enfield.—For erection of a public library, on land adjoining the Hertford Road, Enfield Highway, for the Enfield Urban District Council. Mr. Richard Collins, surveyor:—

S. E. Moss and Co.	£4,369
T. J. Hawkins and Co.	4,365
Lane and Harvey	4,283
E. W. Newman	4,253
L. and W. H. Patman	4,190
Sabey and Son, Ltd.	4,140
Webster and Son	4,129
Myall and Upson	4,100
Brand, Petit and Co.	4,100
A. Porter	4,099
Jennings and Grenfell	4,020
C. F. Kearley	4,000
Spencer, Santo and Co.	4,000
C. Castle and Son	3,978
Fitch and Cox	3,976
J. Guttridge and Sons	3,960
W. H. Hyde and Co.	3,953
B. E. Nightingale	3,930
F. and A. Willmott	3,910
F. and G. Foster	3,892
A. Fairhead and Son	3,794
W. Lawrence and Son	3,782
A. Monk	3,774
H. Knight and Son*	3,650
J. Oram and Son	3,500

*Accepted.

Glanamman (Wales).—For erection of a Congregational chapel and schoolroom at Glanamman, Carm. Mr. H. Herbert, Ammanford, architect:

Jones Bros., Ammanford, S. Wales	£6,650	0	0
W. Daniel, Glanamman, S. Wales	5,680	0	0
D. Rees, Ystalfera, S. Wales	5,336	0	0
W. Evans,* Ammanford, S. Wales	4,784	10	0

*Accepted.

Kirby Muxloe (Leics.).—For erection of a new elementary school at Kirby Muxloe, together with out-offices, drainage, and other works, for the Leicestershire County Council Education Committee. Mr. W. Brand, architect, 33, Bowling Green Street, Leicester. Quantities by Mr. E. G. Fowler, surveyor to the Committee:—

H. H. Garlick	£3,495	0	0
G. L. Martin	3,485	10	0
B. Shipman	3,322	5	0
King and Ridley	3,296	0	0
F. Haycock and Sons	3,290	0	0
P. Rourke	3,260	0	0
Bradshaw Bros.	3,250	0	0
Griffin Bros.	3,250	0	0
Bowles and Son	3,200	0	0
G. Toone and Sons	3,174	0	0
W. F. Harding	3,172	17	6
F. Elliott	3,157	0	0
G. Gurney	3,137	0	0
A. Davey	3,126	19	0
Warburton and Trotter	3,121	2	11
A. B. Moss	3,120	0	0
F. J. Bradford	3,057	0	0
W. Stanger	3,032	0	0
F. Mason	3,012	0	0
A. Faulks	2,992	0	0
E. Fox	2,988	15	10
F. Sleath	2,980	0	0
F. Oldershaw	2,976	0	0
W. Potter	2,974	17	0
A. E. Mould	2,960	0	0
E. W. Garlick,* Leicester	2,950	0	0

*Accepted.

Stratford-on-Avon.—For erection of a villa residence at Stratford-on-Avon, for W. S. Brassington, Esq., F.S.A. Mr. E. G. Holtom, architect, 58, Henley Street, Stratford-on-Avon:—

J. G. Finche and Co.	£1,375
R. Fenwick, Ltd., Birmingham	1,350
G. Hains and Son, Redditch	1,305
W. J. Bloxham, Banbury	1,295
J. Barnsley and Sons, Birmingham	1,288
R. Bowen, Leamington	1,275
E. L. Turner, Birmingham	1,265
J. S. Kimberley, Banbury	1,250
J. Harris and Sons	1,239
W. H. James, Sutton Coldfield	1,235
E. F. Kennard	1,200
G. Whateley and Sons	1,130
R. Harris and Co., Halesowen	1,127
G. Mobbs, Small Heath	1,119
J. Cox*	1,110

Rest of Stratford-on-Avon.
*Accepted.

The WALL-PAPER MANUFACTURERS, Ltd.
"Relief Decorations."

ANAGLYPTA and SALAMANDER
London Show Rooms: 71, Southampton Row, W.C.
London Tel. No.: 2731 Gerrard. Works: Tel. No. 155 Darwen.
Telegrams: "Anaglypta, London." "Anaglypta, Darwen."

LINCRUSTA-WALTON,
CAMÉOID and CORDELOVA
London Show Rooms: 1, Newman Street, W.
Tel. No.: 3769 Gerrard, London. Telegrams: "Lincrusta-Walton, London."

LIGNOMUR Works: Old Ford Road, Bow, E.
Tel. No.: 422 East, London. Telegrams: "Lignomur, London."

SAMPLES, ILLUSTRATIONS, and FULL PARTICULARS can be obtained on application to the respective Branches of the Wall-Paper Manufacturers, Ltd., as above.

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about **five days** after the date of this issue.

Unless expressly stated to the contrary, all deposits required for bills of quantities, etc., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the **contract, which requires them to pay the rates of wages current in the district.**

BUILDING.

June 9-18. **HOLT.**—Erection of a new school at Holt, for the Norfolk Education Committee. Names by June 9, to Olley and Haward, architects, 5, Queen Street, Great Yarmouth, at whose office plans can be inspected, and from whom quantities can be obtained on June 11. A deposit of £1 1s. will be required. Tenders must be delivered to Thos. A. Cox, secretary, Shirehall, Norwich.

June 14. **NEWBURY.**—Erection of new offices for the Newbury T.C. Particulars may be obtained at office of S. J. L. Vincent, A.M.Inst.C.E., borough surveyor, Mansion House Street, and quantities on deposit of £5 Bank of England note. Only builders residing within five miles of Newbury are invited to tender.

June 14. **HALIFAX.**—Various trades in alterations at sundry schools, painting, etc. (at the public libraries and museums), for the Education and Public Library Committee. Plans and specification etc., of James Lord, M.I.C.E., borough engineer, Town Hall, Halifax, on deposit of £1. Tenders to be sent to W. H. Ostler, secretary. Fair wages clause.

June 14. **PORTSMOUTH.**—Erection of a teachers' room and a cloakroom at the George Street council school (girls' department), for the education committee. Form of tender, specification, etc., of the surveyor, A. H. Bone, Cambridge Junction, Portsmouth. Tenders to be sent to the Committee's Offices, Town Hall, Portsmouth. Fair wages clause.

June 14. **NELSON (LANCS.).**—Masons', joiners', plumbers', plasterers' and slaters' work in the erection and completion of the new Palace and Hippodrome, Nelson. Plans and specifications and bills of quantities of Mathew Watson, Landless, and Pearse, architects and surveyors, 2 and 4, Nicholas Street, Burnley, and 21, Dale Street, Liverpool, to whom tenders must be sent.

June 14-29. **WALTHAMSTOW.**—Erection of a junior mixed school, to be erected on the playgrounds of the Coppermill Road school, for the Education Committee. Names to the architect, H. Prosser, M.S.A. Applications for bills of quantities must be sent to the architect, accompanied by deposit of £5. Tenders to be sent to T. W. Liddiard, Secretary to the Committee, High Street, Walthamstow.

June 15. **BARGOED.**—Erection of a bungalow at Bargoed for P. Williams. Plans and specifications of Idris Leyshon, architect and surveyor, Hanbury Road, Bargoed, to whom tenders are to be sent.

June 15. **BALLYMOE.**—Additions and alterations to Ballymoe Church for the Very Rev. James Martin, P.P. Plans, etc., can be seen at the Presbytery, Ballintubber, or at office of William H. Byrne and Son, architects, 20, Suffolk Street, Dublin.

June 15. **CAERAU (WALES).**—Alterations and additions to 90, Tonna Road, Caerau, for Alfred Webb, 1, Protheroe Street, Caerau, to whom tenders are to be sent. W. M. Llewellyn, architect and surveyor. Plans and specification may be seen at 40, Brynmawr Place, Maesteg.

June 15. **DOWLAIS.**—Alterations and additions to Bethania Chapel, Dowlais, and erection of new school, etc., in connection therewith. Plans and specifications and bills of quantities, of E. A. Johnson, F.R.I.B.A., architect, Merthyr Tydfil, on deposit of £2 2s. Tenders to be sent to the secretary, Geo. Hicks, 26, Victoria Street, Dowlais.

June 15. **MIDDLESBROUGH.**—Alterations and additions at Middlesbrough Station, for the North-Eastern Railway. Plans and specification upon application at the station master's office, Middlesbrough. Quantities and further information from William Bell, the Company's architect, at York. Tenders to be sent to R. F. Dunnell, secretary, York.

June 15. **LANGLEY PARK, BEAMISH AND COLD HESELDEN.**—Erection of new Council Schools for the Durham C.C. Plans, specifications, and general conditions, may be seen, and bills of quantities obtained for (1) Langley Park school (600 scholars) and Beamish school (450 scholars) of W. Rushworth, Shire Hall, Durham; and for (2) Cold Heselden school (264 scholars), of J. W. F. Phillipson, architect, Murton Chambers, 8, Grainger Street, Newcastle-on-Tyne. Tenders to be sent to A. J. Dawson, Clerk to the Education Committee, Shire Hall, Durham.

June 16. **GWAUN-CAE-GURWEN (WALES).**—Erection of a church hall at Cwm-Gorse, Gwaun-cae-Gurwen. Plans and specifications can be seen at Glasfryn House.

June 16. **MINERA, NEAR WREXHAM.**—Erection of a new bungalow at Minera, near Wrexham. Plans and specifications to be seen at Plas Gwyn, Minera. Tenders to be sent to G. F. Wynne, Plas Gwyn, Minera.

June 16. **MERSHAM (KENT).**—Execution of summer repairs required at the council school, for the Kent Education Committee. Specifications, etc., of H. Hamilton, 11, Bank Street, Ashford, Kent, to whom tenders are to be sent.

June 16. **ABERYSTWYTH.**—Re-building shops and premises in North Parade, Aberystwyth, for George Wilkinson and J. R. James. Plan and specification may be obtained on application to G. T. Bassett, A.R.I.B.A., architect and surveyor, Aberystwyth, to whom tenders are to be sent.

June 16. **PORTSMOUTH.**—Alterations and additions to the medical officer of health department in the town hall. Specification and plan may be seen, and a form of tender obtained, at the borough engineer's office, town hall. Tenders to be sent to C. Hammond Etherton, Town Clerk, Town Hall, Portsmouth.

June 16. **BELFAST.**—Additions and alterations to the general post office, Belfast, for the Board of Public Works. Plans, etc., of the quantity surveyor, Samuel C. Hunter, 2, Wellington Place, Belfast, also of H. Williams, secretary, Office of Public Works, Dublin, where particulars may be obtained on deposit of £3.

June 16. **AVONMOUTH.**—Construction and maintenance, for twelve months after completion, of a passenger station at the Royal Edward Dock, Avonmouth, for the docks committee. Specification, schedule, form of tender, and form of contract, etc., of W. W. Squire, engineer, Cumberland Road, Bristol, upon the production of a receipt for £5 from the secretary, 19, Queen Square, Bristol. Tenders must be sent to the Secretary of the Docks Committee, 19, Queen Square, Bristol.

June 16. **GLASGOW.**—Alterations and additions to the Port-Dundas electricity station, for the corporation: (1) Brick and mason work; (2) painter work; (3) carpenter, joiner, glazier and ironmongery work; (4) slater work; (5) plumber work; (6) reinforced concrete work; and (7) iron and steel work. Plans and specifications and forms of offer on application to W. W. Lackie, electrical engineer, 75, Waterloo Street, on deposit of £2. Tenders to be sent to A. W. Myles, Town Clerk, City Chambers, Glasgow.

June 17. **BRORA.**—Mason, carpenter, slater, plumber, plasterer, painter and glazies works of new U.F. Church and Manse at Brora. Plans with Robt. J. Macbeth, architect, Inverness, of whom specification, etc., may be obtained.

June 17. **CHURWELL.**—Various works in the erection of warehouse, etc., Lane Side Mills, Churwell, for Charles Scarth and Sons (Limited). Plans and specifications and quantities of T. A. Buttery, F.I.A.S., architect, Queen Street, Morley, and Basinghall Square, Leeds, to whom tenders are to be sent.

June 17. **CARDIFF.**—Erection of the new wing and isolation block to contain 78 beds, a new operating theatre, a pathological block, nurses and servants' bedrooms, and other buildings. Names to Leonard D. Rea, secretary and general superintendent, Cardiff, when bills of quantities can be obtained on deposit of £5 5s.

June 17. **HAMBLEDON (SURREY).**—Erection of a shed with loft over, in the grounds of the workhouse at Hambledon. Plans and specification on application to the board's architect, Edward L. Lunn, 36, High Street, Guildford. Tenders to be delivered to Fredinand Smallpeice, Clerk to the Guardians, 138, High Street, Guildford.

June 17. **LONDON.**—Pointing and other sundry external works at St. George's workhouse, Mint Street, Borough, S.E., for the Southwark Union. Specification, conditions of contract, and forms of tender of the architect, A. J. Wade, 104, Harvist Road, Kilburn, N.W., on deposit of £2 2s. Tenders to be sent to Sydney Wood, Clerk, Union Offices, John Street West, Blackfriars Road, S.E. Fair wages clause.

June 18. **SWANAGE.**—Enlarging the council school for the Dorset County Education Committee. Plans and specifications may be seen at the Town Hall, Swanage. Tenders are to be sent to the secretary, County Education Office, Dorchester.

June 18. **WESTON LULLINGFIELDS (SALOP).**—Erection of two cottages and homesteads for small holdings at Weston Lullingfields, about two miles from Baschurch station, for the Salop C.C. Plans and specification and copies of the bill of quantities and form of tender of the agent, W. T. Hall, College Hill, Shrewsbury, on deposit of £1 1s. Tenders to be delivered to E. Cresswell Peele, Clerk to the C.C., Shirehall, Shrewsbury.

June 18. **ENFIELD.**—Preparation of site, and construction of foundations, and other contingent works for a pumping station, Hadley Road, Enfield, Middlesex, for the Metropolitan Water Board. Drawings, conditions of contract, and specifications of the Chief Engineer, Savoy Court, Strand, W.C., on production of receipt for £10, which must be deposited with the accountant, Savoy Court, Strand, W.C. Tenders to the Clerk, Metropolitan Water Board, Savoy Court, Strand, W.C.

June 18. **LONDON.**—Construction of a store building and other contingent works at the Battersea works of the Board, London, S.W., for the Metropolitan Water Board. Drawings, conditions of contract, and specification, at the offices of the chief engineer, Savoy Court, Strand, W.C., on production of receipt for £10, which must be deposited with the accountant at Savoy Court, Strand, W.C. Tenders to the Clerk, Metropolitan Water Board, Savoy Court, Strand, W.C.

June 19. **BACUP.**—Extensive alterations and additions to the St. Saviour's council school, Bacup. Plans, etc., of Borough Engineer, Municipal Buildings, Bacup, on deposit of £2 2s. Tenders to be sent to Joseph Entwistle, Town Clerk, Bacup, municipal Buildings, Bacup.

June 21. **CARDIGAN.**—Erection of a platform, seating accommodation, etc., for the Eisteddfod Pavilion, for the committee of the Cardigan Semi-National Eisteddfod. Plans and specifications may be seen with D. Williams, Secretary, Yngs, Cardigan, to whom tenders must be sent.

June 21. **STOCKPORT.**—Erection of a bridge (of brick and stone, with steel girder flooring) over the Ashton Canal at Broadstone Road, for the Corporation. Plans and drawings and general conditions, specification, and bill of quantities, with form of tender, on deposit of £2 2s. with John Atkinson, A.M.Inst.C.E., Borough Surveyor, Town Hall, Stockport. Tenders, addressed to the Chairman of the Borough Extension Committee, to be delivered at the Borough Surveyor's office. Fair wages clause.

June 22. **ABBEYFEALE.**—Erection of a central creamery at Abbeyfeale, according to plans, etc., prepared by J. Fant, which may be inspected at the office of M. A. Greaney, secretary, Abbeyfeale Co-operative Creamery, Ltd., Station Road, Abbeyfeale.

June 22. **LOUISVILLE, MONOGHAN (IRELAND).**—Erection of a new laboratory and additions to the boarding-school convent of St. Louis, Louisville, Monaghan. Plans and specification of J. J. M'Donnell, architect, 27, Chichester Street, Belfast, to whom tenders are to be sent.

June 22. **TAUNTON.**—Erection of a new head post office at Taunton, for the Commissioners of H.M. Works and Public Buildings. Drawings, specification, and a copy of the conditions and form of contract, may be seen on application at the Taunton post office. Bills of quantities and forms of tender may be obtained, on deposit of £1 1s. with the secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., to whom tenders are to be sent.

June 22. **EAST HAM.**—Externally repairing, painting, etc., Shaftesbury Road school; also cleansing and whitewashing latrines and urinals at nineteen schools, for the East Ham Education Committee. The work must be done during the summer vacation. Specifications and forms of tender at the Education Office, Wakefield Street, East Ham. £5 Bank of England note, or crossed cheque of equal value with each tender. Tenders must be delivered to H. C. Padgett, Secretary, Education Office, East Ham. Fair wages clause.

June 23. **WINCHESTER.**—Erection of a new secondary school (for 160 girls) at Winchester, for the C.C. of Southampton. Plans, specification, and conditions of contract, and bills of quantities, etc., of W. J. Taylor, county surveyor, The Castle, Winchester. Deposit of £5 5s. by cheque, payable to the Hants C.C. and crossed Bank of England. Tenders to be delivered to H. Barber, Clerk of the C.C., The Castle, Winchester.

June 24. **LLANELLY.**—Erection of a new building for the Llanelly Y.M.C.A. Plans and specifications can be seen with W. Griffiths, F.S.I. architect, Llanelly, of whom bills of quantities may be obtained on deposit of £1 1s. Tenders to be delivered to J. Wesley Jones, Pencastell, Llanelly.

June 24. **KIRKBURTON.**—Builder, joiner, slater, plasterer, plumber and painter works, in the erection of a new (mixed) school, for the West Riding Education Committee. Plans, etc., may be seen on application to the West Riding architect, County Hall, Wakefield. £1 deposit to be sent to the West Riding treasurer. Tenders to be sent to Francis Alvey Darwin, Clerk to the C.C., County Hall, Wakefield.

June 25. **LONDON.**—Erection of a bandstand, composed of wood and tiles, at Boundary Street Garden, Bethnal Green, for the L.C.C. Drawing and specification, form of tender, and other particulars, at the architect's department, 19, Charing Cross Road, W.C., upon deposit of 10s. with the cashier of the Council, at the County Hall, Spring Gardens, S.W. Tenders to be delivered at the County Hall, addressed to the Clerk of the L.C.C., Spring Gardens, S.W. Fair wages clause.

June 25. **ORMSIDE (near APPLEBY).**—Erection of an additional block, 97ft. in length, consisting of two wards with kitchen and nurses' room, lavatories, bath, w.c., etc., in connection with the Joint Infectious Hospital at Ormside. The building will be constructed of match boarding on brick foundations, and will be covered with corrugated iron. Plans and specifications by appointment of the borough surveyor, Appleby. Tenders to be delivered to Wm. Hewitson, clerk to Joint Hospital Committee, Appleby.

June 28. **SHARLSTON.**—Erection of a central Sunday school, near S. Luke's Church, Sharlston; drawings and specifications may be seen at S. Luke's Lodge, Sharlston, near Wakefield, on deposit of £1.

June 28. **GLASGOW.**—Execution of works:—1, digger, mason, brick, and steel; 2, carpenter, joiner, glazier, and ironmonger; 3, plumber; 4, plaster; 5, tile and marble; in connection with Glasgow Royal Infirmary reconstruction. Drawings at the office of the architect, James Miller, A.R.S.A., 15, Blythswood Square. Copies of schedules on deposit of £1 1s. with Peter Rintoul, secretary, 212, West George Street, Glasgow.

June 29. **REDGRAVE.**—Enlargement of the school for the managers. Plans and specifications of the Rector, Redgrave

June 29. **LEYTON.**—Cleansing, painting, and repairs at four schools, improvement of gas lighting at two schools, to be executed during the summer vacation, and hot-water heating apparatus, at Sybourn Street School, now in course of erection, for the U.D.C. Specifications, conditions and forms of tender of William Jacques, A.R.I.B.A., 2, Fen Court, Fenchurch Street, E.C., on deposit of £1 (cheques will not be accepted). Tenders must be delivered at the meeting of the council to be held on June 29, at 7 p.m. Fair wages clause.

Sept. **ASTRACHAN (RUSSIA).**—Construction of water works, rebuilding an aqueduct, and also building new slaughter-houses, for the Municipal council of Astrachan. Tenders can be made for the whole or part of the work. A bond loan of five million roubles will be contracted. Further particulars of the Municipal Council of Astrachan.

No Date. **ROYDON.**—Erection of a new school at Roydon. Plans and specifications can be inspected at Castle Rising Rectory.

No date. **BLANDFORD.**—Erection of a cottage. Particulars may be obtained upon application to B. Baker, Milborne, St. Andrew, Blandford.

No Date. **TAYNUILT.**—Repairing and re-roofing three cottars houses on the Barguillean Estate. Apply for specification to J. Robertson, gamekeeper, Barguillean, Taynuilt.

No date. **ASPATRIA.**—Erection and completion of two brick dwelling-houses at Brayton Road, Aspatria. Plans and specifications may be seen with R. Kirkbride, 49, Park Road, Aspatria.

No Date. **PORTHCAWL.**—Erection of a detached house at Porthcawl. Plans and specifications of E. W. Howard, architect and surveyor, 2, Meadowside Terrace, Springfield, Chelmsford, Essex.

No date. **COVENTRY.**—Repairs, decorations, etc., at Exhall Church, near Coventry. Particulars may be obtained upon application to T. F. Tickner, F.R.I.B.A., architect, High Street Chambers.

No Date. **WHEATLEY HILL.**—Erecting and completing cottages at Wheatley Hill. Persons desirous of tendering should apply in the first case by letter to "Architect," Colliery Hotel, Wheatley Hill.

No date. **CRAGHEAD.**—Erection of a new church at Craghead (whole or any portion of the works). Names, together with a deposit of £1 1s., to Jas. W. Thompson, architect, 63, Grey Street, Newcastle-on-Tyne.

No Date. **PORTSMOUTH.**—Erection of a nurses' home at the Royal Portsmouth, Portsea, and Gosport Hospital. Plans and specification at the office of the architect, C. W. Bevis, F.R.I.B.A., Elm Grove Chambers, Southsea, who will supply bills of quantities upon deposit of £2 2s.

No date. **LLANWRTYD WELLS.**—Erection of hotel and alterations and additions to premises at Llanwrtyd Wells, for J. T. Evans, J.P. Names to Alfred Swash, F.R.I.B.A., Midland Bank Chambers, Newport, Mon, from whom particulars may be obtained.

No Date. **PONTARDAWE.**—Erection of a new Welsh Congregational Chapel at Alltwen, Pontardawe. Plans and specification, and all particulars of James Hinkin, Bryn-yr-allt, Pontardawe, or at the offices of C. S. Thomas, Meager and Jones, architects, Wind Street, Swansea.

No Date. **BALLYKILBEG, CO. DOWN.**—Improvements and additions to St. Malachy's Church, Ballykilbeg, for the Very Rev. Wm. Dempsey, P.P., V.F. Plans and specification of J. J. M'Donnell, architect, 27, Chichester Street, Belfast, to whom tenders are to be sent.

No Date. **SOUTHAMPTON.**—Erection of additions at St. Michael's House, for the Corporation. Plans, specifications, and conditions, and bills of quantities and form of tender, at the borough engineer's office upon production of the borough treasurer's receipt for deposit of £3 3s. Tenders must be delivered to R. R. Linthorne, Town Clerk, Municipal Offices, Southampton.

ENGINEERING.

June 14. **DROYLSDEN.**—Providing and fixing a weighbridge at the sewage disposal works, Droylsden, for the U.D.C. Specifications and forms of tender of the engineer and surveyor, Charles Hall, council offices, Droylsden. Tenders to be sent to Wm. Richards, clerk to the council, council offices, Droylsden.

June 14-29. **SOUTHAMPTON.**—Construction of a scheme of drainage, together with settling tanks and three 62ft. circular bacteria beds, also a 70,000 gallon rain-water tank, together with alterations to the system of rain-water drainage at the Hants County Asylum, near Fareham, for the C.C. Plans, specification, and conditions of contract, bills of quantities, and all other information, of W. J. Taylor, county surveyor, The Castle, Winchester, on and after June 14, on deposit of £10 10s. Tenders must be sent to J. Railton Wyatt, clerk to visiting committee, Hants County Asylum, Fareham.

June 16. **MANCHESTER.**—Electric light installation at offices in New Bridge Street, Manchester, for the board of guardians. Specifications, etc., on deposit of £1 1s., to be sent to James Macdonald, clerk to the Guardians, Poor Law Offices, New Bridge Street, Manchester.

June 18. **BRADFORD.**—Construction of about 1,760 yards of 3ft. 6in. by 2ft. 4in. egg-shaped sewer in brick and concrete, and about 1,260 yards of 24in. stoneware pipe sewer, together with manholes, storm water overflow chamber, and sewer connections, for the corporation. Plans, specification, conditions of contract, and form of tender from Joseph Garfield, Assoc.M.Inst.C.E., sewage works, engineer, Esholt Hall, Shipley, on deposit of £3 3s. Tenders to be sent to Frederick Stevens, Town Clerk, Town Hall, Bradford. Fair wages clause.

June 19. **GLASGOW.**—Supplying oxidiser plant, electric motors, air compressor, piping, etc., for the Shieldhall outfall works, for the Corporation. Specifications and forms of tender at the office of Public Works, City Chambers, 64, Cochrane Street, on deposit of £5. Plans and drawings and further particulars of the consulting engineer, Wm. D. Hamilton, M.Inst.C.E., 59, Bath Street, Glasgow. Offers to be sent to A. W. Wyles, Town Clerk, City Chambers, Glasgow.

June 21. **DUBLIN.**—Reconstruction of bridges with steel-plate girders, for the directors of the Great Northern Railway Company (Ireland). Drawings, etc., at the office of W. H. Mills, engineer-in-chief, Amiens Street, Dublin, or copies of them at the office of the District Engineer, Belfast.

June 21. **ILFORD.**—Execution of heating by hot water on the low-pressure system at the Goodmayes school, Ilford, for the Education Committee. Plans and specifications and forms of tender on application to the architect, C. J. Dawson, F.R.I.B.A., 11, Cranbrook Road, Ilford. Tenders to be sent to W. S. Torbitt, M.A., LL.B., secretary, Education Offices, Ilford.

June 21. **ECCLES.**—Supply and erection at the electricity works, Cawdor Street, Patricroft, of water softening and purifying plant, having capacity of 3,000 gallons per hour, for the Corporation. Specification and forms of tender from the Borough Engineer, Cawder Street, Patricroft, on deosit of £1 1s. Tenders to be delivered to Edwin Parkes, Town Clerk, Town Hall, Eccles.

June 21. **ILFORD.**—Supplying electric light wiring and fittings for about 200 lamps of 16-c.p. and emergency gaslight service at the Goodmayes school, Ilford, for the Education Committee. Plans and specifications and forms of tender on application to the architect, C. J. Dawson, F.R.I.B.A., 11, Cranbrook Road, Ilford. Tenders to be delivered to W. S. Torbit, M.A., LL.B., secretary, Education Offices, Ilford.

June 21. **BRIERLEY HILL.**—Providing, laying, and jointing about:—500 lineal yards of 15in. cast-iron pipes, 1,600 lineal yards of 12in. cast-iron pipes, 1,100 lineal yards of 9in. and 6in. cast-iron pipes, 150 lineal yards of 18in. stoneware pipes, 1,200 yards of 15in. stoneware pipes, 1,400 lineal yards of 12in. stoneware pipes, 18,000 lineal yards of 9in. and 6in. stoneware pipes, together with manholes, lampholes, flushing chambers, and other incidental works in connection with a complete scheme of sewerage for the district in accordance with drawings and specifications prepared by the engineers, for the U.D.C. Drawings, specifications, bills of quantities, and form of tender, of the engineers, Willcox and Raikes, of 63, Temple Row, Birmingham, on deposit of £5 5s. Tenders to be sent to William Waldron, Clerk eo the U.D.C., Council Offices, Brierley Hill.

June 23. **PETERBOROUGH.**—Providing and laying about 2,930 yards of 4in. and 3,200 yards of 3in. cast-iron pipes, with all necessary valves, within the parish of Eye, for the R.D.C. General conditions, specifications, plans, and quantities, of J. W. Buckle, clerk, Priestgate, Peterborough, to whom tenders are to be sent, and of whom quantities may be obtained on deposit of £1 1s.

July 6. **LONDON.**—Construction of a sewer, mainly of cast-iron, lined with concrete, and blue brick, of 6ft. to 8ft. internal diameter, and of a total length of about 42,450ft., to be formed mainly in tunnel, together with penstock and weir chambers, and other incidental works, from Northside, Wandsworth Common, Battersea, to the Deptford pumping station, Greenwich, for the L.C.C. Drawings, specifications, bills of quantities, form of tender, and other particulars, of the chief engineer, Maurice Fitzmaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon deposit with the cashier of the Council of £10. Tenders to be delivered at the County Hall, addressed to the Clerk of the L.C.C., Spring Gardens, S.W.

IRON AND STEEL.

June 15. **LONDON (for INDIA).**—Supply and delivery of:—Girder bridges (five 40ft., five 20ft., four 12ft., and 26 6ft. spans), as per specification to be seen at the Company's offices, for the Bengal and North-Western Railway Company, Limited. Tenders to be sent to Alexander Izat, managing director, 237, Gresham House, Old Broad Street, London, E.C.

June 15. **LINCOLN.**—Supply of valves, etc., for the corporation. Specification and form of tender and drawings of Neil McK. Barron, waterworks engineer, Lincoln, upon production of a receipt from the city accountant for £5 5s. Tenders, addressed to the chairman of the waterworks committee, to be delivered to W. T. Page, Deputy Town Clerk, Bank Street, Lincoln.

June 15. **LINCOLN.**—Supply of about 12,600 tons of cast-iron pipes, and special castings 21in. diameter, for the corporation. Specification and form of tender and drawings of Neil McK. Barron, waterworks engineer, Lincoln, upon production of a receipt from the city accountant for £5 5s. Tenders, addressed to the chairman of the waterworks committee, to be delivered to W. T. Page, deputy Town Clerk, Bank Street, Lincoln.

June 17. **TOOTING.**—Supply and erection of wrought-iron unclimbable fencing at the Lambeth cemetery, Blackshaw Road, Tooting, for the Corporation. Specification and form of tender may be had on application to Henry Edwards, C.E., borough engineer, town hall, Brixton Hill, S.W. Tenders must be delivered to Henry J. Smith, Town Clerk, Lambeth Town Hall, Brixton Hill, S.W.

June 19. **NOTTINGHAM.**—Supplying for the ensuing year:—1, cast-iron double-faced sluice valves and hydrants; 2, cast-iron main pipes, cast-iron special pipes; 3, lead piping, lead ingots; 4, gun-metal taps and ferrule fittings; for the Corporation. Specifications and drawings, with samples, weights, etc., and other information, of the water engineer, F. W. Davies, St. Peter's Church-side. Forms of tender may be obtained at that office on deposit of £1 1s. Tenders to be delivered to J. A. H. Green, Town Clerk, Guildhall, Nottingham.

Sept. 1. **LONDON, for BRISBANE (QUEENSLAND).**—Supplying 42in. and 48in. steel pipes, or 42in. and 48in. wrought iron pipes, or 42in. and 48in. cast-iron pipes, for the Brisbane Board of Water Works. Specifications and drawings may be obtained at the office of the engineer to the agent-general for Queensland, 409 and 410, Strand, London, W.C., on payment of £3 3s. Tenders must be sent addressed to the secretary, Brisbane Board of Water Works, Brisbane, Queensland.

PAINTING.

June 2—14. **WEST HAM.**—Cleansing, repairs, and painting of schools during the summer vacation, for the corporation. Written application to William Jacques, A.R.I.B.A., Architect to the Education Committee, 2, Fen Court, Fenchurch Street, E.C., for specification and form of tender, by June 2, accompanied by a deposit of £1 (cheques not accepted). Tenders must be delivered by registered post at the Educational Department, 25, The Grove, Stratford. Fair wages clause.

June 7-17. **CLEETHORPES (Lincs.).**—Painting the exterior of Elliston Street council school at Cleethorpes; also tarring and sanding playgrounds, for the Lindsey C.C. Education Committee. Bills of quantities and form of tender of Scorer and Gamble, architects, Bank Street Chambers, Lincoln, on or before June 7, and on deposit of £1 1s. Tenders to S. Maudson Grant, secretary, 286, High Street, Lincoln.

June 14. **BRISTOL.**—Painting, colouring, etc., certain schools, for the Bristol Education Committee. Specifications and conditions of contract from Peter Addie, Exchange, Corn Street, Bristol, on deposit of £1 1s. Tenders must be sent to Wm. Avery Adams, secretary, Guildhall, Bristol.

June 15. **LEMINGTON-ON-TYNE.**—Papering, etc., rooms of the Lemington and District Club and Institute, Ltd. Particulars on application at the Club. Tenders to be sent to the secretary, John Carr, Lemington and District Club and Institute, Ltd., Lemington-on-Tyne.

June 15. **LONDON.**—General exterior cleaning, painting, etc., at the receiving workhouse and casual wards, Sheffield Street, Lincoln's Inn Fields, London, W.C., for the Strand Union. Specifications at the offices of the Architect to the Guardians, A. A. Kekwick, 47 and 48, Amberley House, Norfolk Street, Strand, W.C. Bills of quantities may be obtained on deposit of a £5 Bank of England note. Tenders must be delivered to the Clerk to the Guardians, 15, Henrietta Street, Covent Garden, W.C.

June 17. **HULL.**—Painting, colouring, whitewashing, etc., certain schools, for the Corporations. Particulars and forms of tender can be obtained of J. T. Riley, Secretary of Education, Education Offices, Albion Street, to whom tenders are to be sent.

June 18. **BOOTLE (LANCS.).**—Painting at council schools, for the Corporation. Particulars may be obtained at the borough engineer's office, town hall. Tenders to be delivered at the office of J. Henry Farmer, town clerk, Bootle.

June 19. **LUTON.**—Cleaning, painting and repairing Aley Green Lodge and Chapel, for the Aley Green Cemetery Joint Committee. Specification can be seen at 7, George Street West, Luton. Tenders must be sent to William Austin, clerk, 7, George Street West, Luton.

June 19. **MACCLESFIELD.**—Outside painting of the infirmary annexe and nurses' home at the Parkside Asylum, for the C.C., of Chester. Specification, etc., of H. Beswick, County Architect, Chester. Tenders to be sent to A. C. Procter, Clerk to the Committee of Visitors, 23, King Edward Street. Macclesfield.

June 21. **HEPTONSTALL.**—Cleaning, painting, and decorating Heptonstall parish church. Specifications may be obtained and designs seen at the offices of Sutcliffe and Sutcliffe, F.S.I., architects, New Road, Hebdenbridge, to whom tenders are to be sent.

June 22. **ISLEWORTH.**—Painting, distempering, and other works at the Mogden Isolation Hospital, near Kneller Hall, Isleworth, for the Corporation of Richmond (Surrey). Forms of specification, etc., can be obtained upon written application to the Clerk to the Committee, 213, High Street, Hounslow.

No Date. **BLACKBURN.**—Painting and decorating the beerhouse, "Standard of Unity," Mincing Lane, Blackburn. Full particulars may be obtained on application at the Weavers' Office, 1, Clayton Street, Blackburn.

PLUMBING AND SANITARY.

June 14. **ROCHFORD.**—Constructing about 142 yards of sewer at Castle Lane, Rayleigh, in accordance with plan and specification, which may be seen on application to H. T. Sidwell, surveyor, Rayleigh, for the R.D.C. Tenders to be sent to Frederic Gregson, clerk, Southend-on-Sea.

June 16. **BRAINTREE.**—Providing and laying about 180 yards of 6in. stoneware pipe sewer, together with the necessary manholes, for the U.D.C. Specification of H. H. Nankivell, Surveyor to the Council, Vestry Hall, Braintree. Tenders to be sent to Herbert J. Cunnington, clerk, Braintree.

June 16. **WHALTON.**—Construction of about 900 lineal yards of 6in. sanitary pipe sewer, together with the necessary manholes, etc. Specifications and plans at the office of J. Jameson, surveyor, Ponteland. Tenders to be sent to Rev. Canon Walker, Chairman of the Parish Council, Whalton Rectory, Morpeth.

June 17. **ROSS.**—Erection of new closets and alterations at the Lea C.F. schools, near Ross. Plans, etc., may be seen at the Rectory.

June 19. **HARROGATE.**—Extension of the north outfall sewage disposal works at Bilton, for the Corporation. Plans and specification and form of tender at the office of the engineers, E. W. Dixon and Ritchie, 3, East Parade, Leeds, or 1a, Cambridge Crescent, Harrogate, upon deposit of £2 2s. Tenders must be sent to J. Turner Taylor, town clerk, Municipal Offices, Harrogate.

June 25. **SUTTON COLDFIELD.**—Sewering and draining Hill and Streetly Districts, and laying a length of sewer in Riland Road, including manholes, sewage lift, flushing chambers, etc., for the corporation. Specification, form of tender, and bills of quantities on deposit of £5. Tenders to be addressed to the town clerk, Council House, Sutton Coldfield.

June 26. **WINDSOR.**—Forming connections between house drains and sewers in the parish of Clewer Without from and after June 30, for the R.D.C. Conditions from the surveyor to the council, W. Menzies, Englefield Green, Surrey. Tenders must be delivered to J. E. Gale, clerk, 3, Sheet Street, Windsor.

June 28. **ANSTON.**—Laying about 3,900 yards of 9in. and 6in. stoneware pipe sewers, construction of manholes, tanks, filters, and other appurtenant works at Anston, for the Kiveton Park R.D.C. Drawings and copies of the specification, bill of quantities, and form of tender at the offices of the engineers, Berrington, Son and Watney, Bank Buildings, Lichfield Street, Wolverhampton, and 28, Victoria Street, Westminster, S.W., on deposit of £5s. 5s. Tenders must be delivered to James Snow Whall, solicitor, Clerk to the Council, 66, Bridge Street, Worksop.

ROADS AND CARTAGE.

June 14. **LEEDS.**—Flagging a portion of Street Lane, and paving Bower Road (part) and Rockingham Street, for the Corporation. Forms of tenders and bills of quantities, etc., on application at the highways office, 155, Kirkstall Road. Tenders must be delivered at the town clerk's office, Town Hall, Leeds.

June 14. **BRISTOL.**—Re-laying and re-facing playgrounds of the council schools, for the Bristol Education Committee. About 4,777 superficial yards to be re-laid and about 4,756 superficial yards to be re-faced. Copies of the specifications may be obtained from Peter Addie, Exchange, Corn Street, Bristol. Tenders must be delivered at the office of the education committee, Guildhall.

June 14. **SEVENOAKS.**—Supplying 465 yards cube, more or less, of granite or quartzite broken to a gauge of 2ins., for the U.D.C. Forms of tenders, with specification and conditions, of Samuel Towlson, A.M.I.C.E., surveyor to the council, Argyle Road, Sevenoaks, to whom samples must be delivered. Tenders to be delivered to Herbert J. Thompson, Clerk to the Council, U.D.C. offices, Sevenoaks.

June 15. **LONDON.**—Wood-paving the carriageways, on either side of the tramway tracks, in Malpas Road and Shardeloes Road, with creosoted deal blocks, and other works in connection therewith, for the Corporation of Deptford. Form of tender, specification, and all other information, of the borough surveyor, J. Sutcliffe, A.M.Inst.C.E., Town Hall, New Cross Road, S.E. Tenders must be delivered to Vivian Orchard, town clerk, Town hall, New Cross Road, S.E. Fair wages clause.

June 16. **RYE (SUSSEX).**—Carrying out a sewerage scheme for the drainage of Rye Harbour Sussex, for the R.D.C. Drawings, etc., on deposit of a £5 Bank of England note, with the engineer, T. J. Mossflower, C.E., Carlton Chambers, Bristol, on and after May 27, and at 28, Victoria Street, Westminster, on June 11. Tenders to be delivered to Theodore J. Smith, clerk to the R.D.C. Flushing House, Rye.

June 19. **CANNOCK.**—Levelling, metalling, channelling, and making good the following private streets:—Newhall Street, Cannock; Bradford Street, Hightown; McGhie Street, Hednesford; for the U.D.C. Plans, sections, specifications, and conditions of contract, and forms of tender, on application to J. S. Hendry, surveyor to the council. Tenders must be delivered to C. A. Loxton, Clerk to the Council, Council Offices, Crannock.

June 21. **KINGSTON (SURREY).**—Supplying 100 tons of best blue Guernsey granite spalls, to be delivered at the workhouse, Coombe Road, Kingston-on-Thames, for the union. Tenders to be sent to Chas. W. Dash, Clerk to the Guardians, Union Offices, Coombe Road, Kingston-on-Thames.

June 21. **STEVENAGE.**—Supply of 1,000 tons (more or less) $1\frac{3}{4}$in. to 2in., $1\frac{1}{2}$in. to $1\frac{3}{4}$in., and 1in. to $1\frac{1}{2}$in. broken Guernsey, Leicester, or other granite, for repair of roads, to be delivered at Stevenage railway station and sidings (G.N.R.), for the U.D.C. Tenders, accompanied by samples, to be delivered to Wm. Onslow Times, Clerk to the Council, Council Offices, Orchard Road, Stevenage.

June 22. **GOSFORTH.**—Supplying broken whinstone, etc., for a period of twelve months, for the U.D.C. Particulars may be obtained on application to the engineer and surveyor, George Nelson, A.M.I.C.E., Council Chambers, High Street. Tenders, endorsed "Supply of Road Material," to be sent to R. Sheriton Holmes, solicitor, Clerk to the Council, Council Offices, Gosforth.

June 26. **LEWES.**—Scarifying and steam road-rolling, for the Corporation. Forms of tender and further information can be obtained at the Borough Surveyor's Office, Town Hall, Lewes. Tenders to be left at the office of Montague S. Blaker, town clerk, Town Hall, Lewes.

June 26. **LEWES.**—Supplying 600 tons of 2in. broken granite, 150 tons of coarse granite screenings, and 500 tons of broken surface-picked flints, for the Corporation. Forms of tender and specification may be had, and any further information obtained, at the Borough Surveyor's Office, Town Hall, Lewes. Tenders must be left with Montague S. Blaker, Town Clerk, Town Hall, Lewes.

MISCELLANEOUS.

June 11-14. **MANCHESTER.**—Supply and delivery of the following stores during twelve months ending June 30, 1910, for the Corporation:—Bolts and nuts, brooms and brushes, brass castings, brass taps, cement (Portland), clothing (official), chemicals and apparatus for laboratories, iron castings, iron and steel, lamp fittings, lead piping, lime for purification, wet and dry gas meters, oils, paints, spades and shovels, steel castings, timber, tinware, tubes and fittings (gas, steam, and service), waste and cleaners, yarns, and ropes, etc. Particulars and forms of tender on application (in writing only) from Charles Nickson, superintendent, gas department, town hall, Manchester. Tenders to be sent to Wm. Henry Talbot, Town Clerk, Town Hall, Manchester.

June 14. **HINDLEY.**—Supplying about 8,000 tons of best screened Arley gas nuts, engine slack, and lime, for the twelve months ending June 30, 1910. Particulars and forms of tender from H. O. Timmins, gas engineer. Tenders must be delivered to Thos. Robey, Clerk to the Council.

June 14. **PORTSMOUTH.**—Fixing a boarding to playground railings at Kent Street council school, for the education committee. Form of tender, specification, and all information may be obtained from the surveyor, A. H. Bone, Cambridge Junction, Portsmouth. Tenders must be delivered to the Committee's Offices, Town Hall, Portsmouth.

June 15. **LONDON.**—Supply and delivery of cupboards, tables, carpenters' benches, laundry furniture, etc., for the L.C.C. Full particulars on application to G. L. Gomme, Clerk of the L.C.C., County Hall, Spring Gardens, S.W., to whom tenders are to be sent.

June 18. **CLECKHEATON.**—Supplying the following for the year ending June 30, 1910, for the U.D.C.:—1, lias lime and Portland cement; 2, granite; 5, tar, pitch, and creosote oil, 6, stoneware pipes; 8, dross, circular kerbs, and setts; 9, fodder and straw, etc.; 12, cartage of coal to and from railway station to gasworks. Forms of tender, conditions, and full particulars, of John H. Linfield, Clerk to the Council, Town Hall, Cleckheaton, to whom tenders are to be sent.

June 26. **WALLSEND.**—Widening the main road adjoining the cemetery (Church Bank), including the removal and re-erection of palisading and entrance gates, macadamising, etc., for the Corporation. Specifications may be seen on application to the Borough Surveyor, Town Hall, Wallsend. Tenders, endorsed "Tender for Street Widening," to be sent to W. V. Mulcaster, Town Clerk, 28, Sandhill, Newcastle-upon-Tyne.

THE
Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,
General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE Draughtsman (24), 9 years' experience; structural and ornamental ironwork, desires post in London or Southampton, office or outdoor.—Z., 36, Bartholomew Villas, London, N.W. 5082

ACADEMY (Royal) exhibitor prepares perspectives on moderate terms; specimens sent; also designs, plans from rough sketches, drawings, tracings, competition work, etc.—Box 4983, BUILDERS' JOURNAL Office.

ADVERTISER, with six years' practical experience and a knowledge of bookkeeping and office routine, desires situation in builder's or estate agent's office.—C. J. Mounter, 24, Hillfield Road, West Hampstead, N.W. 5028

ADVERTISER seeks position as junior assistant, 3½ years' experience; excellent draughtsman, surveying, levelling, book-keeping, general office routine; highest testimonials; low salary.—Box 5045, BUILDERS' JOURNAL Office.

AN experienced young architect, with small connection, desires position or work at own office; prolific designer and rapid draughtsman; specifications, etc.—"C.," 24, Hainthorpe Road, West Norwood, S.E. 5026

AN Architect's Assistant desires re-engagement; town or country; neat and quick draughtsman; thoroughly capable; moderate salary.—M. P., 358, New Cross Road, S.E.

ADVERTISER (19) seeks Situation as Draughtsman, 4½ years' experience; working drawings from rough sketches, good tracer and colourist, knowledge of reinforced concrete construction.—Apply, Box 5106, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant desires re-engagement in a good London office; eight years' experience; good references; experience in competition work.—B. E. Atkinson, jun., 14, Rosslyn Hill, Hampstead, N.W. 5018

ARCHITECT'S Assistant seeks re-engagement; just completed two years with city firm (nine years' experience London and Provinces); good all-round man; highest references; moderate salary.—Box 5099, BUILDERS' JOURNAL Office.

ARCHITECT and Surveyor's Assistant desires engagement, 15 years' experience; working drawings, details, surveys, specifications, levelling, and general routine; excellent references; moderate salary.—O. R., South View, Church Road, Egham. 5095

ARCHITECT'S Junior Assistant, 5 years' experience, neat draughtsman, competitive and domestic work, contract drawings, details, perspectives, assist quantities; honours construction; low salary.—W. Ernest Clarke, Cheam Road, Ewell. 5091

ARCHITECT'S Assistant (23), student R.I.B.A. 6½ years, varied experience, working drawings, details, levelling, surveying, drainage, specifications, quantities; excellent references; town or country; salary moderate.—Bernard A. Dyer, 3, St. Peter Street, Hereford. 5085.

ARCHITECT'S Assistant (23), excellent draughtsman, desires re-engagement; six years' first-class experience; contract, detail and competition drawings, specifications, perspectives (exhibitor at Royal Academy); prizeman for architectural design; highest references; moderate terms.—F.E.T., 10, Cobham Road, Kingston-on-Thames. 5015

ARCHITECT, 32, qualified, seeks any position where his services would be available; energetic; disengaged; mod. salary.—Box 5006, BUILDERS' JOURNAL Office.

ARCHITECT, civil engineer (26), building, municipal, and engineering experience, desires immediate appointment; good draughtsman; quantities, surveys, levels, sewage, railway, domestic and industrial buildings; testimonials; moderate salary.—Box 5080, BUILDERS' JOURNAL Office.

ARCHITECT'S Junior Assistant (19) desires engagement, over 20 years' experience; working plans from rough sketches, good tracer, colourist, and typist; small salary.—B., 15, Marine Parade, Brighton. 5088

ARCHITECT and Quantity Surveyor renders professional assistance, at own office, or elsewhere; any period or distance; contract, competition, perspective drawings.—Box 5104, BUILDERS' JOURNAL Office.

ARCHITECT'S Junior Assistant desires engagement as improver, 3½ years' good London experience; moderate salary.—Box 5087, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant, engagement wanted; member Society of Architects, 11½ years first-class provincial public and domestic work; drawings, specifications, assist quantities, supervision; permanency; age 27; salary £3 3s. — Box 5081, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant seeks engagement; 14 years' experience; plans, details, specifications, quantities, surveying, dilapidations, and levelling; excellent references.—C. G., "Brooklyn," Leas Road, Guildford.

ARCHITECT'S Assistant disengaged, good all-round; design, construction, specification, supervision, dilapidations, surveying, etc.; excellent testimonials.—H., "Bowood," Heronsgate, Ricksmansworth, Herts.

ARCHITECT'S Assistant seeks engagement; good draughtsman; working drawings, details, surveying, levelling, and quantities; eight years' experience.—Owen, "Meadowside," New Queen Street, Chesterfield.

ARCHITECT'S Competent Assistant desires engagement; many years' practical experience; designs, details, specifications, superintendence, surveying; two guineas.—Arch, 23, Lavenham Road, Wandsworth, S.W.

ARCHITECT and Surveyor's junior assistant (22), 4½ years' experience, desires re-engagement; neat and expeditious draughtsman; working drawings, surveying and levelling.—Williams, "Brynderwen," Pontyclun, Glam.

A.R.I.B.A., disengaged shortly, London training; chief and senior assistant in leading provincial offices; expert designer, and experienced in all branches.—A. G., "Beverley," Yardley Wood Road, Moseley, Birmingham.

ARCHITECT'S Assistant (23), capable draughtsman; good constructionalist; would go on trial for permanency; town or country; temporary work 35s.—H. J. W. E., 1, St. Dunstan's Road, Hanwell, W.

ARCHITECT'S Assistant (22), desires re-engagement in London office; contract drawings, details, surveys, double scholarship holder; Stage III. Building Construction.—Smeed, 24, West Ham Lane, Stratford, E. 5050

ARCHITECT, prepares designs, working drawings, specifications, on moderate terms; assistance rendered, town or country.—Box 5,036, BUILDERS' JOURNAL Office.

ARCHITECT'S Junior Assistant (20), 4½ years' experience, West End and country offices; working drawings, details, perspectives, competitions, general office routine; excellent draughtsman and tracer. Highest references; salary 25s.—G. W. S., 26, Cowley Road, Ilford, Essex. 5056

AS traveller, constructional steel, or founders; good connection architects, builders; good estimating and draughtsmanship; over 22 years' experience.—W. 61, Royal Hill, Greenwich. 5077

BUILDER'S Clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N. 5037

BUILDER'S Book-keeper, 9 years' excellent reference from present employer. All books, double entry, prime costs, accounts, trading and profit and loss accounts, etc.—Box 5049, BUILDERS' JOURNAL Office.

BUILDER'S, Manager, Estimator and Surveyor, seeks re-engagement; competent, reliable, energetic; quantities, estimates, supervision, measure, adjust accounts and variations; entire charge; thorough, practical experience all branches; excellent references.—H., 1, Elmslea Villas, South View, Farnham. 5105

BUILDER'S Assistant (22) desires Situation in town or country, good knowledge of plans, specifications, quantities, measuring, accounts, outside supervision, and setting out.—F. B., 30, Carminia Road, Upper Tooting, S.W. 5101

BUILDER'S Son (22) with 6 years' practical experience, desires situation with a firm of contractors to gain experience; abstainer, excellent references; certificated.—Box 5094, BUILDERS' JOURNAL Office.

CARPENTER, and French polisher wants situation, young, capable workman, good refs.; moderate wage.—C.P., 21, Redstone Road, Redhill, Surrey. 4989

CLERK of Works, disengaged, well up in all trades; levelling and surveying; best references; abstainer.—R. E., 3, Oakfield Road, Stroud Green, London, N. 5084

DRAUGHTSMAN (26), home or abroad, neat, quick tracer and colourist, working drawings from rough sketches, bookkeeping and general office routine; foreign experience.—H.W., 64, Crofton Road, Camberwell, S.E. 5003

ESTATE Clerk of Works, or otherwise, desires engagement, over 20 years' practical experience, estates and public works, up-to-date knowledge of farm buildings, cottage, saw mill work, and machinery, water supply and drainage, preparing plans and estimates; exceptional testimonials.—Alfred T. Peck, "Lulworth," Hatherley Road, Winchester. 5090

FOREMAN, general or carpenter, conversant all branches, abstainer; time, cost, and stock books; moderate salary.—Box 5093, BUILDERS' JOURNAL Office.

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W. 4951

GENTLEMAN, with good connection amongst architects and builders with offices in Westminster, is open to undertake agency for London and district for good provincial firm.—Box 5072, BUILDERS' JOURNAL Office.

GENERAL Foreman in the Midlands seeks an engagement; thoroughly competent manager, all trades, wide and varied experience, well up in all details.—Box 5086, BUILDERS' JOURNAL Office.

QUANTITY Surveyor's Assistant desires permanent or temporary engagement; taking off, specifications, valuations, etc.; varied London experience; excellent references; passed F.S.I. — Box 5100, BUILDERS' JOURNAL Office.

YOUTH wants situation, surveyor's or builder's office; four years' experience; working up quantities, measuring up, good draughtsman; scholarship holder; excellent testimonial.—J. R. O., 233, Essex Road, N. 5017

Appointments Vacant.

CLERK wanted, junior, temporary, as Bookkeeper, one used to time sheets and prime cost; salary £1 per week.—Apply, with copies of references, to Martin and Co., Builders, Tonbridge. 5102

STOREKEEPER required for Public Works Department in Northern Nigeria for one tour of twelve months' residential service, with possible extension; salary £300 a year, rising annually by £10 to £350; free single quarters and first-class passages out and home again on satisfactory completion of engagement; half salary on voyage out, full salary from date of arrival in Protectorate; two months' leave on full pay granted after 12 months' residential service, increased to four months if returning to Protectorate, full pay during voyage or voyages with free passages; strict medical examination and vaccination if necessary. Candidates must not exceed the age of 40 years; they must have had experience in a similar capacity in charge of general stores used in building construction, be competent bookkeepers; thoroughly conversant with the cost of materials, the principle of allocation, preparation of indents, stocktaking, receipts and issues, and be competent to take out quantities from a drawing. Applications (no special form required), stating age, whether married or single, giving particulars of experience, accompanied by copies (not originals) of testimonials, will be received by the Crown Agents for the Colonies, Whitehall Gardens, S.W., up to 21st June. Quote M3547 on top left-hand corner of letter of application. 5103

WANTED expert Designer of structural steel work, with knowledge of reinforced concrete preferred.—Apply, stating age, experience, salary required, to Box 5092, BUILDERS' JOURNAL Office.

Miscellaneous.

BUILDER'S Books at tremendous reductions!! Books on every subject and for all examinations, supplied; sent on approval. Catalogues free; state wants. Books purchased.—W. and G. Foyle, 135, Charing Cross Road, W.C.

For **SLIDE RULES** and
Reducing Scales,
Try B. J. HALL AND CO., LTD.,
39, Victoria Street, Westminster.

SECOND-HAND Optical Mart.
For the Purchase and Sale of
LEVELS, THEODOLITES, DRAWING INSTRS.
— Clarkson's, 338, High Holborn, London, W.C. (Opposite Gray's Inn Road).

WANTED at once, large quantity second-hand scaffold boards, poles, 28 to 35 ft.; cords and putlogs, in good condition. Price and full particulars.—Box 5053, BUILDERS' JOURNAL Office.

WANTED, 6 copies of THE BUILDERS' JOURNAL for December 21st, 1904. 6d. offered for each copy.—The Publisher. THE BUILDERS' JOURNAL, Caxton House, Westminster, S.W. 5078

WANTED Clay's "School Buildings" and Rivington's "Building Construction III."—Box 5096, BUILDERS' JOURNAL Office.

June 16, 1909.

Volume 29. No. 749.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders:—Duties on Land Values, A Root Principle, 555; Aesthetic Paris 556
Notes on Competitions 556
Correspondence:—Middlesbrough Library Competition, 556; Dampness and Efflorescence in Walls; Architects, Builders, and Land Taxes 557
The New Presidents and Vice-Presidents of the Architectural Association 559
Suburban Stations and Town Planning ... 561
R.I.B.A. 561
The English Church Pageant 561
Enquiries Answered:—Repairing Portland Stone Work; Board of Education Examinations in Architecture; Validity of Conditions of Land Purchase, 562; Books on Land and Estate Agency; Surveying Plots of Land; Fireplace Openings; Rejection of Materials, 563; Construction of Header Arches 564
Our Plate: Sennowe Park, Norfolk 564
A Simple Planimeter. By A. E. Fletcher, M.S.E. 566
Trade and Craft:—Kerno Specialities; Instruments, etc., for Surveyors and Draughtsmen 567
Electricity in Buildings. By Harold Hastings, M.I.E.E., A.M.Inst.C.E. 568
The Fire at Messrs. W. N. Froy's 570
Federation News 570
Tenders ... ... vi., viii.
Complete List of Contracts Open, 572, xviii., xix.

ILLUSTRATIONS.

The Old Gateway of St. Bartholomew's-the-Great, Smithfield. From a Pencil Drawing by W. E. Barker 557
Middlesbrough Library Competition. Design submitted by F. Sills and T. Lawrence Dale, AA.R.I.B.A. 558
Portraits of Mr. Henry Tanner, F.R.I.B.A., Mr. F. Dare Clapham, F.R.I.B.A., and Mr. C. Wontner Smith, A.R.I.B.A. ... ... [illegible]
St. George's Parochial Hall and Building, Gateshead. Richard Wylie, A.R.I.B.A., architect ... ... [illegible]
New Pathological Block, St. Bartholomew's Hospital, London. E. B. I'Anson, F.R.I.B.A., architect ... ... [illegible]
Construction of Header Arches [illegible]
Alteration and Additions to Sennowe Hall, Norfolk (see also centre plate) ... ... [illegible]
Society of Architects' Travelling Studentship Design Placed First. C. H. Hudson, architect 565
House at Pauler's Pury, Northants. Herbert Norman, architect ... ... [illegible]
Small House and Studio, near North End Road, Hampstead. John W. Rhodes, architect ... ... [illegible]
Views of the Fire at Messrs. W. N. Froy and Sons' ... ... [illegible]

Duties on Land Values.

The immediate effect of the proposed duties on land values will naturally be that holders of land likely to be considered liable to the new taxation will have to consider their position, and such persons will call a halt of preparations in connection with land and building schemes until they have done so. This halt will probably act as a temporary check on the anxiously awaited revival of building. The important question is as to the permanent effects of the new taxation. Take the case of present holders of undeveloped land possessed of a site value. Up to the present time such holders have had to consider whether present prices obtainable will show a margin over the capital invested and the accrued interest less any revenue derived from the land in its undeveloped state. They have also had to consider whether the prospects of increased site value were such as would pay them to continue to hold the land, or whether it was preferable to sell as soon as possible to save a probable loss of either interest or part of the principal. In the former, there is no pressure to sell; in the latter, there is: but in this case, precisely because the prospects make it desirable to sell, they also make it undesirable to buy, so that the demand is slack. Upon these two classes of landholders the new taxation will probably have a different effect; the former will continue to hold if the indications are favourable to his recouping ultimately the capital invested, accrued interest, and accrued taxation on the site value; and provided these anticipations are realised, the effect of a new taxation will be to increase the cost of the land, and consequently the cost and revenue-producing power of the buildings ultimately put on it. The effect will, however, be of a remote character; the latter class of holder will see his present possible margin of profit on his investment diminished, possibly in danger of being extinguished, by the new taxation, and will be under pressure to that extent to sell. But his land will not be desirable by other holders unless sold at a sacrifice, because, for the reason given above, demand for development work is slack. The effect of the new taxation on this class of holder will be detrimental to him, and will tend to reduce the site value of the land to a point at which a demand for it will arise. But demand only arises because houses or other buildings are required owing to growth in the locality, and some localities remain stationary for long periods. In such cases, although the land may be deemed to have a site value greater than its agricultural value, and so be taxed, the taxation may be in effect only piling up the sunk capital value without increasing the site value. Such holders can only get out at a loss. In the neighbourhood of large cities, the former conditions are likely to prevail, but about small towns the latter conditions are more likely. The net result, so far as the building trade is concerned, seems to be that in the former case building will be checked; while in the latter case it will not be stimulated, for although the land may be thrown on the market at a cheap rate, there is not the necessary demand for houses, etc., to cause it to be built upon. Probably the best policy for holders of land having a small site value and for the moment unsaleable for building on, is to let it out or sell it for allotment and small-holding land. As such, it would probably escape taxation for its site value, if this value was but slightly in excess of the value of agricultural land, because the whole value due to agricultural use is deductable from the site value, and the tax is only payable on the difference, and the agricultural value of allotments is in excess of that of ordinary farm land. In the case of land let on long leases, the tax falls on the leaseholder, who stands in place of the owner. Such land would be probably in course of development as a building estate; and similar considerations to those already shown to apply to holders of site value land would apply to the builder or speculator having the estate in hand; but as his having the estate in hand presupposes a good demand for houses, it would appear to be his best policy to develop the estate as rapidly as possible. Once developed, the land comes under the increment value tax; so that, one way or the other, all land will have to bear increased taxation, and it seems to be merely a question of circumstance whether the burden falls on present or future owners, and whether the conditions of supply and demand enable it to be covered by higher rent or cause it to be paid out of capital. In any case, the new taxation is likely to prove detrimental to the building trade, and indirectly to tend to prolong the already long period of trade depression through which this industry is passing.

A Root Principle.

Tityrus, reclining in spite of the ungenial weather) under the wide-spreading beech, has reconstructed for the benefit of the select few who have leisure to read the leaders in the "Times" the well-worn comparison between architecture and trees. Some have held that the dim cathedral aisles were conceived in imitation of avenues of trees; others, reversing the spell, see in the flecked and traceried avenue of trees the cathedral of Nature. The resemblance may be accidental, but it is of ancient notoriety. "Only at the climax of a long process of development, when the builders had learnt to make interiors that seemed to triumph over the earth's attraction, did any likeness to an avenue of trees appear; and if the builders of Amiens or Bourges ever noticed such a likeness, we may be sure that it pleased them only as a happy accident." Yet, having brushed aside the argument from design, the writer proceeds to develop the analogy: "The great tree trunks soar out of the earth and bear all their spreading branches as lightly as a flower is borne by its stalk; and in the same way the great columns soar, branching out into arches, and at last into the fans of the vault which they seem to bear no less lightly. There is also this further resemblance between them—that in each case the appearance of lightness is produced by an elaborate concealed structure. There are all the spreading roots of the tree underground; and outside the church there are all the buttresses and flying buttresses. The interior tells nothing of these except to the instructed eye; and we take the roots of the tree for granted only because we know that all trees have roots. A great part of our delight in the tree's soaring lightness comes from our æsthetic ignoring of the fact that it is all produced by a system of underground engineering." These and sundry other poetico-philosophical reflections appear to have occurred to our Tityrus in contemplation of "a great beech tree in mid-May sunlight." "If you lie under it and look up, you are moved by the same contrast between soaring strength of structure and glittering multiplicity of ornament as in a great Gothic church." There is, he discerns, in each case the same intimate relationship between structure and ornament; but what seems to be ornament "is only the beautiful performance of a necessary process." These tongues in trees and sermons in stones convey to our Tityrus the gospel so insistently preached by William Morris, that men should put joy into their work. The art that deliberately aims at beauty and nothing else is never the greatest art: "it is commonest when art is most completely divorced from life, when men have lost the power of doing or making things with delight, and therefore beautifully." Art is then most apt to become a stale convention; and herein it seems to us are suggested the chief danger and the greatest difficulty in the training of the architect. But our Tityrus, recumbent under his beech, has adumbrated for us a root principle. How to apply it is a problem for educationists.

Æsthetic Paris. Ugly buildings in Paris! Is it possible? One had become accustomed to think that the Parisian's taste was so instinctive and ingrained that it would be impossible for him to achieve an absolutely ugly building, even if he tried very hard. Yet we are informed that ugly buildings are positively being erected in Paris. It is probably some alien or outer barbarian who is guilty of this sacrilege. The wording of the announcement of the misdeed certainly leaves us this loophole, for it is distinctly stated that "The Parisian has been recently scandalised by the erection in his beloved city of enormous buildings—often on the finest sites—which are not only ugly in themselves, but entirely out of harmony with their surroundings;" and the Parisian, having no Puritanical history behind him, is hardly the man to be scandalised by his own actions. One is further relieved to find that the Parisian is not going to take it lying down. He has invoked the aid of his rather autocratic Municipal Council, who have graciously hearkened to his exceeding bitter cry. The regulations with regard to height and architecture are to be rigidly enforced. Although one of the offending buildings has been nicknamed the *gratte-ciel*, nothing approaching either to the dimensions or to the uncomeliness of a skyscraper will be suffered to sully the beauty of what is still the fairest city of Europe. A building in the Place de l'Etoile that exceeds by 80 centimetres the regulation height is to be brought within the rules. Moreover, the decree of 1902 that permits the erection of buildings 100ft. high is to be abrogated, and public opinion is warmly supporting this decision of the Council. The Parisian is bestirring himself not a moment too soon, for it would seem that the authorities had allowed themselves to become somewhat lax in the exercise of their plenary powers—a contingency that is very apt to arise where restrictions are so numerous and minute that it must be rather difficult to recollect them all. In the Place Vendome, for instance, fine examples of eighteenth-century architecture are much disfigured by aggressive and unauthorised shop signs. Now that they have got upon the sensitive nerves of the æsthetic Parisian, they are likely to receive short shrift; for the French official, when once he has received the word of command, is sudden and swift in its drastic execution. Paris is contemplating the expenditure of 792 millions of francs on what hitherto would have been called street improvements, but what may now be more appropriately termed an heroic essay in town planning; and apparently she is approaching the task with æsthetic sensibility.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION
July 9	STOKE-UPON TRENT. Additions to Town Hall including large hall to seat 3,000 people, police court, etc. Premiums of £100 and £50 for second and third designs respectively. Assessor nominated by Pres. R.I.B.A. Conditions and particulars from Jno. B. Ashwell, Town Clerk, Town Hall, Stoke-on-Trent,
July 17	NEW PUBLIC BUILDINGS, BURSLEM. The Architect whose design is placed first by the Assessor will be appointed to carry out the work. Premiums of £100 and £75 to authors of second and third designs, respectively, Conditions and plan of site from F. Bettany, Borough Surveyor. Deposit, £2 2s., returnable on receipt of *bona fide* design.
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby. (See Note below.)
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
No date.	WALLASEY U.D. COUNCIL. CARNEGIE LIBRARY in Earlston Road, Liscard, Chester. Limited to Architects practising in Lancashire and Cheshire. Particulars from W. H. Travers, A.M.I.C.E., Public Offices, Egremont, Cheshire. Deposit £2, refunded on receipt of designs, or on return of all papers and intimation of non-participation within seven days of obtaining same.

Middlesbrough Library.

It is credibly stated that "sheaves of letters" from architects who took part in this competition were read at a meeting of the Free Library Committee, held on June 9th. Some of these correspondents stated, in effect, that they had actually prepared sketch plans on similar lines to the arrangement adopted, but had reluctantly abandoned them in order to comply with the conditions. It was decided that the Town Clerk should be instructed to inform the correspondents that their letters had been submitted to the assessor. It was also stated that a memorial protesting against violation of the conditions (the terms of the protest were given in our issue last week), and signed by 108 of the competitors, had been received by the Town Clerk, who reported that a copy of it had been forwarded to the assessor, who replied by telegram as follows:—"I consider the objections of the architects frivolous and vexatious, and regret that any body of architects could so act in a public matter." Messrs. Russell and Cooper, the successful competitors, forwarded a letter in which they denied that they had violated the conditions of the competition. The chairman (Mr. J. S. Calvert) emphasised the point that a clause in the conditions stipulated that the assessor's award should be final. Everything had been done in perfect order, as far as he could see. They had appointed an assessor in whom they had every confidence. He had given his assessment, and they had proceeded on the assumption that he had acted strictly in accordance with instructions. Councillor Roberts remarked that, so far as they as a Council were concerned, they had received the recommendation of the assessor, and therefore it was final; and any of the aggrieved architects who wished to should, in his opinion, communicate with the assessor, and not with the Middlesbrough Council or the Free Library Committee. This view was shared by the majority, who decided on the course stated above. Several councillors, however, shared the view that the competitors had good ground for complaint, but it was not disputed that the most suitable design had been selected. In the letter from Messrs. Russell and Cooper which is printed on the opposite page, those gentlemen point out that the chief ground of objection among the aggrieved competitors seems to be the fact that the authors of the premiated design adopted an independent interpretation of the word "adjoining." If, as they claim, this word is capable of the construction they have put upon it, *cadit quæstio*; but should the conditions have been so loosely worded as to admit of diverse interpretations? At any rate, the case, as another correspondent contends, "should help to convince the R.I.B.A. of the necessity and the possibility of reform."

Model Village near Stafford.

The result of a limited competition instituted by Messrs. Chance and Hunt, Ltd., for a model village near Stafford, has been announced as follows:—1st, Messrs. Buckland and Haywood-Farmer, Birmingham; 2nd (£20 premium), Mr. Geo. H. Wenyon, Dudley.

Grimsby Town Hall Extension.

At a meeting of Grimsby Town Council, held on Friday, June 4th, when the minutes of the various committees came up for confirmation, Councillor Easton moved an amendment "that that part of the Finance Committee's minutes relating to the appointment of Sir Alfred Gelder as assessor of the plans submitted in the competition in connection with the Town Hall extension be not confirmed." This amendment was carried by 18 votes to 13. It was pointed out, however, that the committee's resolution had been already acted upon, the minutes of the Finance Committee having been confirmed at a full Council meeting. It was further complained that the vote refusing to confirm the minutes was really a snap-vote, the attendance being very small. A councillor who desired to postpone for twelve months the whole question of the Town Hall extension (possibly with the object of giving the Council time in which to achieve the apparently difficult feat of making up their minds, or to indulge in the diversion of further see-saw "decisions") was told that such a motion would be out of order.

Correspondence.

[*The Editor declines responsibility for the statements made by correspondents.*]

Middlesbrough Library Competition.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—The Middlesbrough competition again brings us face to face with one of the natural and inevitable results of our absurd conduct of competitions. Such a result may possibly annoy, but it can hardly surprise us, as it is exactly the result we have carefully arranged ourselves.

You rightly point out the difficulty of the position in which the assessor is placed, but we must not forget that although he may have accepted the position, the competitors created it. The heroic course for the assessor may be to resign, but the obvious course for the competitors—entailing no heroism—is not to compete. Then the position would not arise. But the position having arisen, I think we must admit that the public interests, and the interests of architecture, are bound to override all other considerations.

Your communicated article seems to hit the nail on the head in eight words, "They should not make hard and fast conditions." This is the root of the whole trouble. No competition should have—in the very nature of things it cannot have—any other absolute conditions affecting the design than those inherent in the nature of the case. To invent any others is to stultify the whole idea of the competition, and gratuitously to look for trouble. The site, the money, the accommodation, are the facts of the case—the materials with which we work—but there is no reason why even these should be made absolutely binding conditions in every case. Indeed, no more than two of them can be absolutely binding in any case—the site and the money, or the site and the accommodation, as the case may be. All else affecting the design should be by way of suggestion and information only, and the more information the better.

Perhaps this extremely hard case may help to convince the R.I.B.A. of the necessity and the possibility of reform.

Westminster. A. R. Jemmett.

To the Editor of The Builders' Journal.

Sir,—Our attention has been attracted to the statement that we violated the conditions of the above competition in the preparation of our design, and that a protest signed by a large number of the competitors has been lodged against the award.

While we have no concern with this protest, which is a matter between the Corporation, assessor, and the competitors, we desire to make our own position clear regarding the manner in which we interpreted the conditions, and we shall be obliged if you will insert this letter.

Our chief cause of offence appears to be the way we understand the word "Adjoining." We read this with its context as follows:—"The general lending and reference libraries are to be placed in the northern part of the block (of buildings already existing) adjoining the dwelling houses in Dunning Street," and these rooms were so placed by us.

If it was the intention that these rooms should abut against the dwelling houses, we should have expected the conditions to read that they should be "at the north end of the site adjoining the houses."

FROM THE DRAWING BY W. E. BARKER

With the exception of the Tower of London and its immediate neighbourhood, there is no part of the City of more historical interest than the district around the old Priory Church of St. Bartholomew the Great in West Smithfield. The illustration shows the ancient gateway which has for nearly 600 years formed the principal entrance to the church. The gateway is of the Early English period, with dog-tooth ornaments and four gracefully moulded orders. At present it is partly covered on one side by a stationery store, and a large board advertising edibles overshadows the apex of the arch. The engraving is reproduced from an original pencil drawing.

Regarding the door communicating between the news room and the staircase hall, this was labelled pass door on the drawings, and dealt with as such in our report. The door can be blocked up, if desired, but the passage must still remain for access to the janitor and unpacking room.

Russell and Cooper.

Dampness and Efflorescence in Walls.

To the Editor of The Builders' Journal.

Sir,—I was surprised that in the article on the above subject, in your issue for June 2 (p. 524) no mention was made of the fact that sand—or its substitute—used in the making of mortar or plaster, is frequently the culprit in producing that disagreeable damp appearance on papered walls, and the efflorescence on distempered walls.

Where this occurs at the seaside, one generally puts it down to sea sand having been used; the salt in the sand being so sensitive to a damp atmosphere as to show that floury whiteness whenever the humidity reaches a certain point. Here in the north-west London district, I have come across another material that is used in the mixing up of plaster that will produce the same effect as sea sand, and this is boiler-flue dust, or sweepings from chemical works. The dust is very fine, reddish in colour, and has a certain amount of sharpness. In one case I came across, the builder had to strip the walls and re-plaster five rooms in a new house to get rid of this objectionable material. During moist weather the paper on the walls had a very damp appearance, which in drying had the look of fine flour. The paint on the bath-room walls would not dry—or rather, after drying, became moist and sticky, while the distemper on the frieze resembled a spring frost.

In recently investigating a complaint of dampness in a new house, I found the concrete over the site, and the walls under the ground floor, perfectly dry, the damp course perfectly in order, yet the plaster on the party wall in the front room on the ground floor, and also that in the front bed-room, were undoubtedly damp. I examined the wall in the roof, and found the bricks and mortar to be dust-dry. This state of dampness I found only occurred in two out of six houses, and, after making further enquiries, I came to the conclusion that the cause of the dampness was that flue-dust had been used in the plaster of these particular houses.

I remember a case in the north where the efflorescence came out on the dado of the hospital wall. Keene's cement had been used to face up the Portland cement dado, but here I failed to ascertain the cause, though I had a shrewd suspicion that some chemical action had taken place between the two cements.

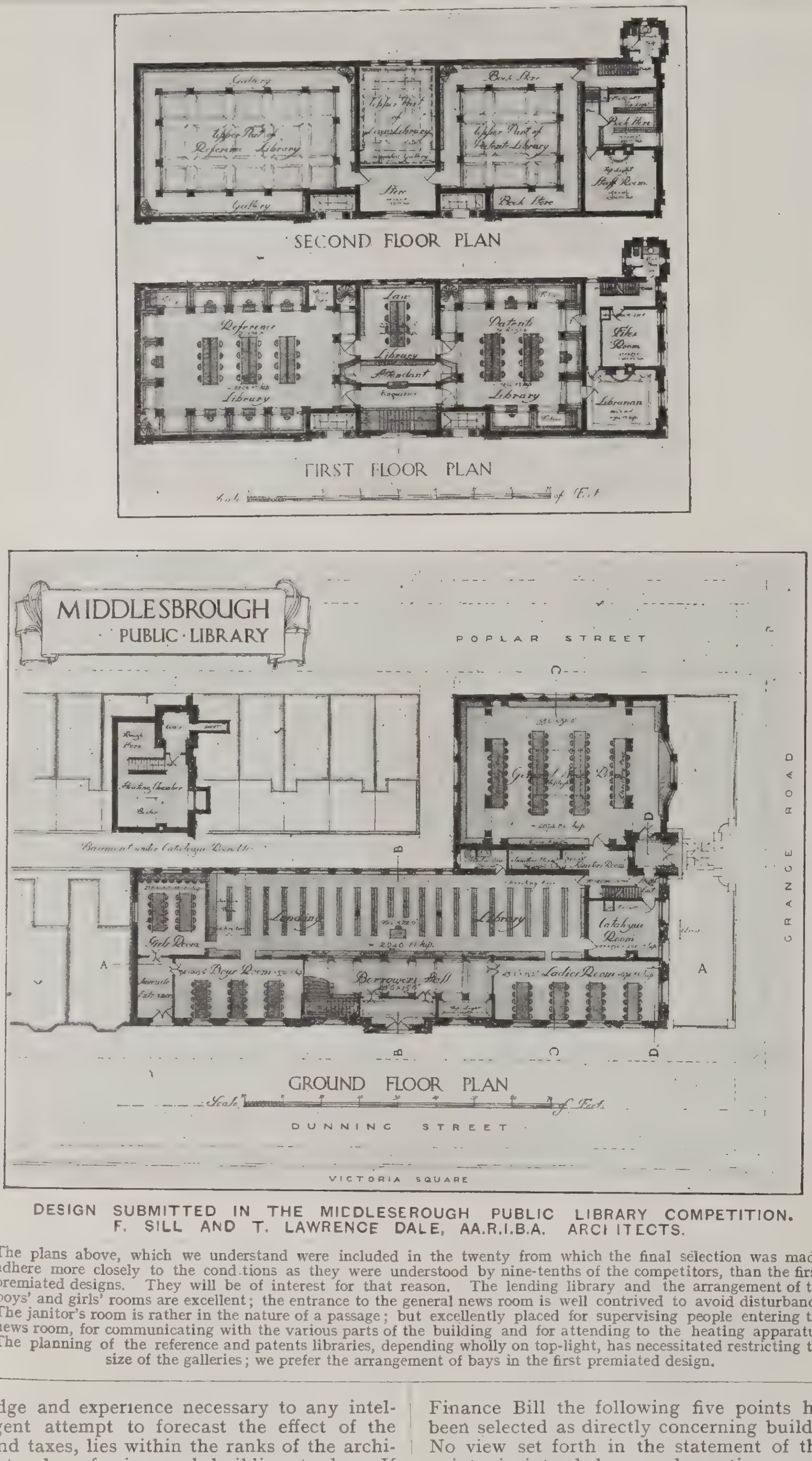
It is quite evident to my mind that we are still short of information on the important subject of mortars, plasters, and cements. We know what the ideal constituents of these are, but unfortunately idealism and commercialism do not always run together, and one cannot condemn a thing just because it is not the ideal material; yet, on the other hand, one wants to be in a position to condemn when a material is proved defective or objectionable. G.H.G.

Architects, Builders, and the Land Taxes.

To the Editor of The Builders' Journal.

Sir,—One reason why builders and others have not responded more fully to your invitation to discuss the land taxes is, no doubt, the intricate nature of the provisions of the Finance Bill. Another probable reason is the remoteness of the actual application of a great part of the new taxation. We may wait till a new long lease has expired before being asked for reversion duty. A transfer must be effected after an appreciable rise in value has taken place, before we can feel the weight of the increment duty in cold cash. Nevertheless, as the novel and drastic proposals contained in the Budget alter the relation of the people to the land, they must have a powerful and an immediate effect on values, and for good or ill on the building industry.

A great portion of the practical know-



DESIGN SUBMITTED IN THE MIDDLESBROUGH PUBLIC LIBRARY COMPETITION.
F. SILL AND T. LAWRENCE DALE, AA.R.I.B.A. ARCHITECTS.

The plans above, which we understand were included in the twenty from which the final selection was made, adhere more closely to the conditions as they were understood by nine-tenths of the competitors, than the first-premiated designs. They will be of interest for that reason. The lending library and the arrangement of the boys' and girls' rooms are excellent; the entrance to the general news room is well contrived to avoid disturbance. The janitor's room is rather in the nature of a passage; but excellently placed for supervising people entering the news room, for communicating with the various parts of the building and for attending to the heating apparatus. The planning of the reference and patents libraries, depending wholly on top-light, has necessitated restricting the size of the galleries; we prefer the arrangement of bays in the first premiated design.

---

ledge and experience necessary to any intelligent attempt to forecast the effect of the land taxes, lies within the ranks of the architectural profession and building trades. If the Finance Bill is not adequately canvassed and discussed by these bodies, it will, in a sense, not be considered at all. In this case we shall be luckier than we deserve if we escape the natural reward of easy indifference.

The undeveloped duty must have an immediate effect on the market where the builder seeks the land he needs. The increment, reversion, and stamp duties must have an immediate effect on the value of the houses he is trying to sell; as well as affecting the subjects of much of his contract work. Along with landowners, lenders, and architects, builders are directly affected. They will only be doing their duty to themselves and to the community in considering and communicating their views. For this is a matter which cannot be properly discussed without their help.

From the wide field covered by the Finance Bill the following five points have been selected as directly concerning builders. No view set forth in the statement of these points is intended as a dogmatic assertion of opinion, the terms of its expression notwithstanding. They are merely suggestions for your prospective correspondents' consideration:—

(1) Will the ½d. duty on undeveloped land cheapen building sites by forcing them on the market? Let us consider a suburban plot of one acre which the owner reasonably expects to let for building within the next few years at a ground rent of £100. A present capital value might be adjusted with the assessors of about £1,800, with a deduction of £300 on account of expenditure on roads and drains and other preparatory work. The owner would then have to pay annually until the development took place ½d. per £ on the net value of £1,500, or £3 2s. 6d. This would absorb the greater part, perhaps the whole, of the free revenue which would probably be drawn from an agricultural rent of about £5. The owners of plots wholly in this position will be pressed to develop their land at the earliest possible moment, but the owners of larger plots not wholly ripe for immediate building will not be pressed to the same extent. For the lower capital value of their less ripe land must lessen the average burden of the duty in proportion to the agricultural revenue. The financial strength or weakness of the landowners will become a greater element in the market than it is now. With wealthy men holding and poorer men pressing their land for development, wide fluctuations in the price of equally desirable ground may be expected.

Builders should consider also whether the 10 per cent. reversion duty on the benefit accruing to the lessor will not diminish the ground offered on lease, and increase that offered on sale. It seems also reasonable to suppose that reversions will fall in both rank and value as investments.

(2) Who will ultimately bear the 20 per cent. increment duty? This is a question of vital import to builders, which should materially influence their attitude in the controversy. It is one of the most difficult problems that could be propounded, but its solution must be attempted lest we stumble blindly into difficulties. If the owner already referred to has held his acre for a few years and sold it to a builder for £2,400, or let it at an equivalent, he will then, the original value being £1,800, pay 20 per cent. increment duty on £600 or £120. The writer will merely advance with due reserve this general theory for the consideration of your readers: that when business is brisk or landowners strong, the builder, and ultimately the occupant, will pay; and where business is slack or landowners weak, the landowner will be forced to forego his profit to that extent. Applying the same principle to old properties, the buyer will pay when the demand is great, and the seller when the demand is small.

(3) How will lenders regard the taxation of land? Is it not reasonable to suppose that some lenders will take the broad view that a substantial increment duty on their improving securities, without any corresponding compensation on their deteriorating securities, along with the reversion duty and increased stamp tax, renders house property a less desirable security than formerly? If lenders regard the proposals in this way, builders will find that the amount of money available for their operations is less, and that the rates of interest are higher.

(4) With the changed needs of new occupants, a great volume of contract building follows the transfer of old properties. The prospective seller will not be so "willing" as in time past, for he must now surrender one-fifth of any increase accruing since April 30th of this year. The prospective buyer will hesitate, knowing that he too if he sells or lets, and his heir, inevitably must undergo the same taxation. And both will pause and contemplate the doubled stamp duty. Before the Budget, a property bought for £1,000 and sold afterwards for £1,200, was subject to a stamp duty of £6. After the Budget, the same transaction will cost for stamp duty £12, in increment duty £40, £52 in all, or over eight times the former Imperial taxation. It may be urged—possibly with some reason—that those who make such profits can well afford to pay. But returning to the "heads-I-win" "tails-you-lose" nature of the increment duty, and the increased stamp duty, will the effect not be to discourage transfers, constrain people to remain content as they are, and so to diminish the volume of business of this class?

(5) Most of the taxation in question is new in principle. If it passes into law and the principle is established, it will be a simple matter for any future Government to increase the rate of any or all of the taxes. Consideration should be given to the question as to whether fear of such future increase will diminish values beyond the point that the taxes, as now proposed, may be reasonably computed to do.

Victor D. Horsburgh.

THE NEW PRESIDENT AND VICE-PRESIDENTS OF THE ARCHITECTURAL ASSOCIATION.

The new President, who is the son of Sir Henry Tanner, I.S.O., the Chief Architect to H.M. Office of Works, was born in 1876, educated at the Merchant Taylors' School, and matriculated at London University. Mr. Tanner was articled to his father, and afterwards entered the office of Sir Aston Webb, R.A. He also studied at the Royal Academy Schools, where he won the travelling studentship in 1900. He was elected an Associate of the R.I.B.A. in 1899, and a Fellow in 1907. The President has been connected with the A.A. since 1896, and in 1903 was appointed hon. secretary, a post he occupied for four years; for the last two sessions he has been a vice-president.

As a result of much study and careful measuring and sketching throughout the country, he brought out in 1902 a volume of measured drawings, entitled "English Interior Woodwork." He was joint author with Mr. H. Inigo Triggs of "Some Architectural Works of Inigo Jones," and also (with Mr. W. Galsworthy Davie) of "Old English Doorways." He has not however ceased his literary efforts, for he is at present one of the editors of the "Purple Patch."

He has designed several important works in London, chief among which are Oceanic House, the new offices for the White Star Line in Cockspur Street; Craven House in Kingsway; flats, business premises, and a large garage in Wardour Street, and some factories at Homerton. In the country he has carried out several large alterations and additions to the following:—Club House, Royal St. George's Golf Club, Sandwich; Crawley Grange, Bucks, for Irvine J. Boswell, Esq.; Aston Hall, Staffordshire, for J. Guy Knight, Esq.; also various new buildings in town and country for business and domestic purposes. He has had considerable experience in what may be termed the legal side of the profession with regard to questions under the Building Act and dealing with light and air.

Photo: Stereoscopic Company.

MR. HENRY TANNER, F.R.I.B.A.
THE NEW PRESIDENT OF THE A.A.

Like the retiring President, Mr. Cave, he is a good sportsman. At school he was several years in the cricket XI. and the football XV., and afterwards played football for the Old Merchant Taylors. He has been a keen golfer for some time, and is a member of the Royal St. George's. His election as President for the coming session is a fitting reward for six years' hard work in connection with the A.A., and although probably the youngest President for many years, few who have occupied the chair can show a longer record of continuous work in its service.

Mr. F. Dare Clapham, who proceeded from the Associateship to the Fellowship of the Royal Institute last week, is a partner in the firm of Mountford and Clapham, architects of the New London Sessions House, the Lancaster Town Hall, and other public buildings. Like his fellow vice-president, Mr. C. Wontner Smith, Mr. Clapham has taken a prominent part in the A.A. Plays, and, indeed, has been one of the mainstays of them since their inception. Their election as vice-presidents is a well-deserved honour.

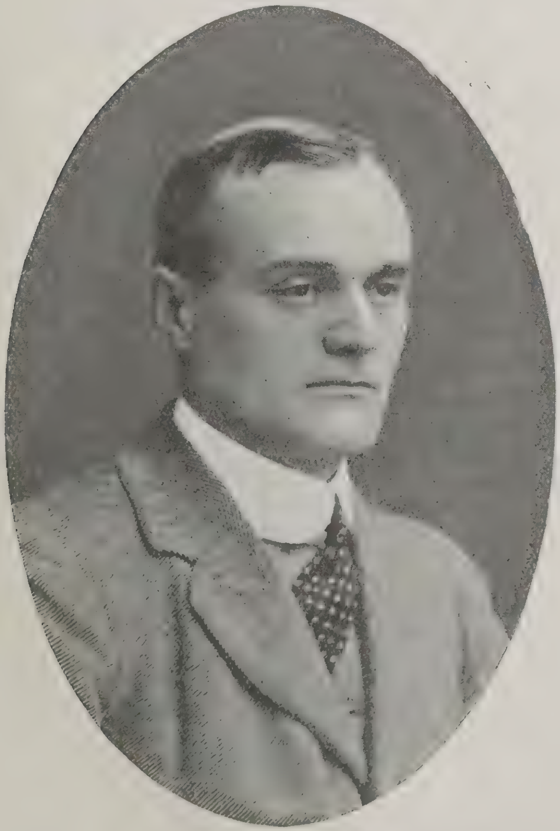
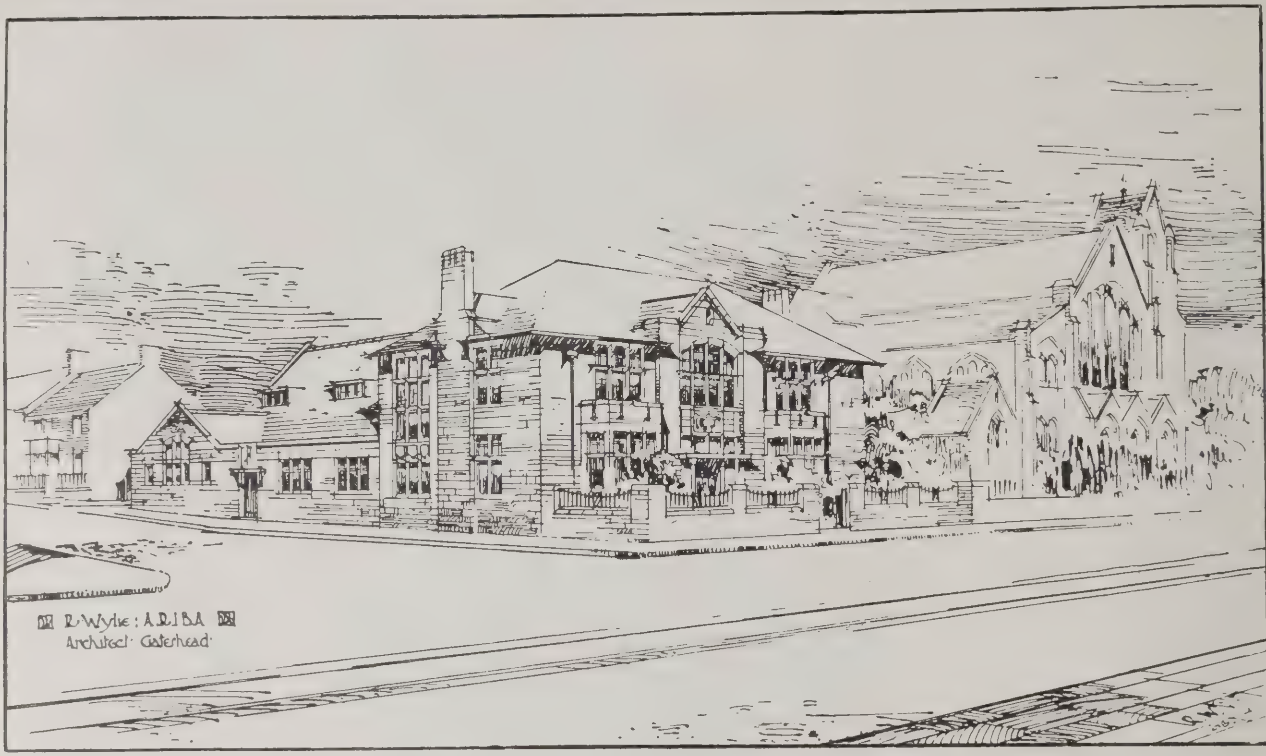


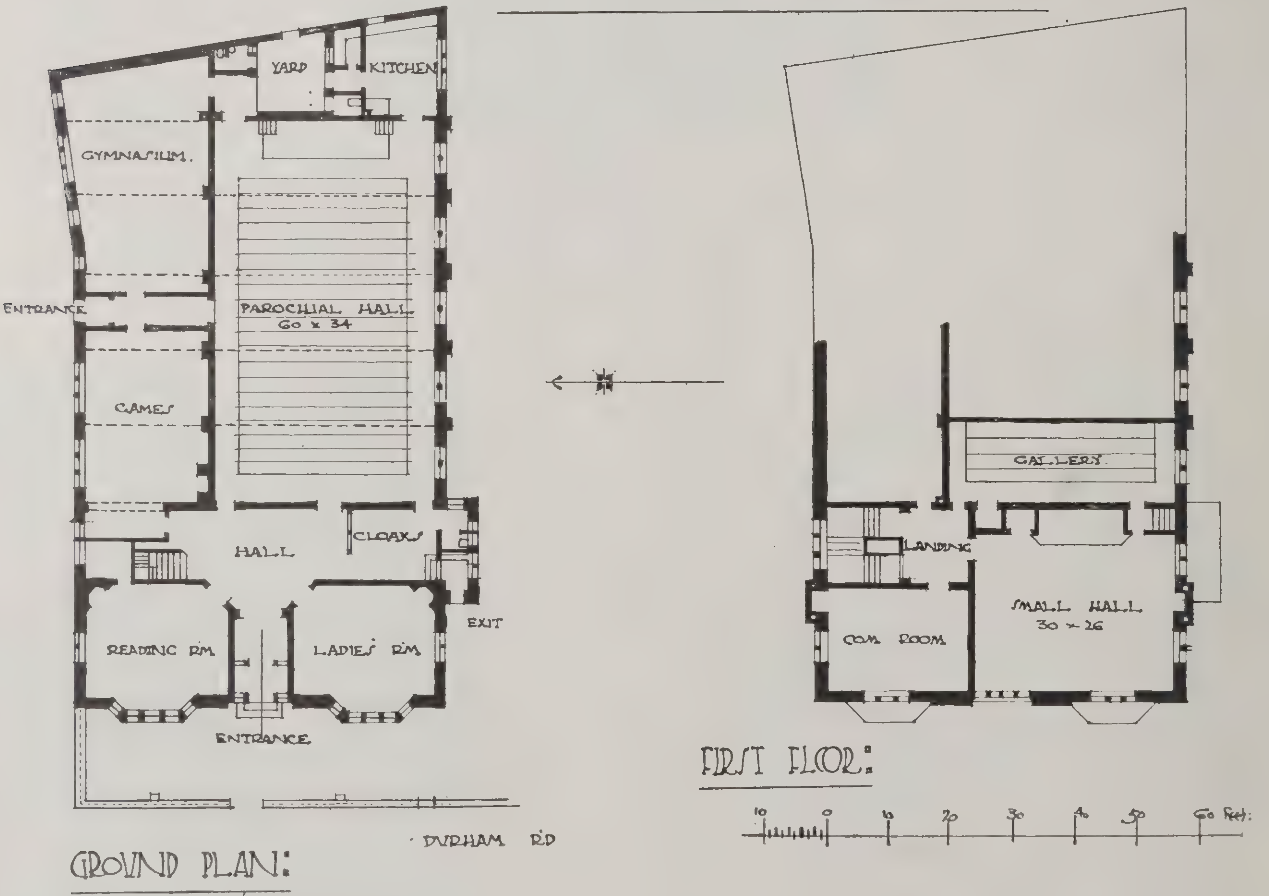
Photo: Langfier, Ltd.

MR. F. DARE CLAPHAM, F.R.I.B.A.
New Vice-President of the A.A.

Photo: Histed & Co.

MR. C. WONTNER SMITH, A.R.I.B.A.
New Vice-President o the A.A.





ST. GEORGE'S PAROCHIAL HALL AND BUILDINGS, GATESHEAD. RICHARD WYLIE, A.R.I.B.A., ARCHITECT.

The design for these buildings was selected in competition.

The front block of the new buildings is two storeys in height, with a small basement in addition for heating purposes, while the rear portion is of one storey, and includes the Parish Hall. The principal floor has a spacious front entrance, 9 feet wide, and large crush hall, from which the principal rooms are entered. On the left is a ladies' room, 20ft. by 17ft., and cloak-room and lavatory, and, on the other side, a reading room, 20ft. by 17ft., and games room about 26ft. by 17ft., from which side also the main staircase ascends. The Parish Hall, 60ft. by 34ft., has three exits at this end into crush space, and has seating accommodation, exclusive of platform, for 340 people, with provision for possible future gallery, and 80 others. A gymnasium,, 36ft. by 18ft. with open roof, is placed at the north-east corner of the buildings, with separate entrance and exit, as may be needed. On the first floor there is a large upper hall, 20ft. by 10ft., with room 30ft. by 26ft., for small meetings, having a small platform (screened off when not required), and with a direct emergency exit, which would also serve as a possible gallery to parish hall. A committee room, 20ft. by 17ft., is also entered from upper hall, and a storage room for seats, etc., is placed over games room. The buildings are of coursed rock-faced stone walling to main fronts, with chiselled bays and dressings, covered with grey slates. The floors to entrance hall and vestibule are of patent composition on cement, and to Parish Hall wood blocks on a similar foundation. Fire-resisting materials are used as far as possible in all staircases and other constructional parts. The dadoes to games room and gymnasium are of cement, and to large hall of redwood cleading, the latter to have also open hammer-beam roof. Heating is on the hot-water low-pressure system, with radiators to entrances and principal rooms, and fire-places are in all rooms. Natural ventilation is relied upon, with separate vent. The style of architecture of the new buildings is of a simple Gothic character in harmony with the adjoining St. George's Church; the cost, exclusive of furnishing, being estimated at £2,800.

SUBURBAN STATIONS AND TOWN PLANNING.

The extensive reconstruction of stations on the Underground Railway reminds one rather forcibly of the fact that the suburban railway station will have to be reckoned with in any well-considered scheme of town planning. It is remarkable how almost immediately upon the first arrival of railways the great terminus stations were raised upon an ample scale, and each provided with the indispensable adjunct of an hotel, reached directly from the platform, and, as a rule, a handsome building. In the suburbs the type of building was that of Loudoun Road, a chalet-like structure with the light Tudor detail then so much in favour, containing the booking office, the station itself being on a low level beneath. In the middle of the late reign, brick buildings on a larger scale, like that of Highbury, with its forecourt, began to arise; some years later, the general re-introduction of red brick helped towards the creation of a species of suburban station which may be seen at Finchley Road (Metropolitan); it is of low elevation—showing how tenacious is the English mind of the tradition of low and spreading architecture wherever space admits of such treatment: a little terra-cotta begins to appear, too, and a clock illuminated at night is placed, as it should be in every station, over the entrance. The station, the surrounding villas, the open flagged space, and the neighbouring church, all make up an effective picture; but here commendation must end, for the inferior is dark, and so are the waiting rooms, a defect which is rendered worse by the dismal tones of colour of that period; tones whose inventors chose to call them "æsthetic."

Passing on to West Hampstead, we find another Metropolitan station, of a newer type, with abundance of light given by large arched windows, and a roof broken by the inevitable and uncompromising dormer. It is a station built on a bridge, and within a few yards are stations of the Midland and the London and North Western, all of whose lines run under it; from several points a singular and not uninteresting view is obtained. In the background rises the long outline of Hampstead Hill, crowned by the little green spire and red-brick tower of Hampstead Church, built by Flitcroft in 1745, but all the foreground is occupied by railways; no fewer than four great lines traversing the great open space, and all disappearing into tunnels which penetrate the hill at points not very far apart.

On the whole the suburban station answers its purpose fairly well, but more might be made of it, and its comforts could be easily increased if a little foresight were used in planning suburbs whose growth indeed can easily be foreseen. The great terminal stations are so well appointed as to be almost luxurious—save for the mistake made in the newest of them of abolishing the cheerful open fireplace in the waiting rooms—but suburban travelling is now so important that the station has become the recognised centre of each neighbourhood; a covered approach, a restaurant, or at least a "tea shop,"—now much wanted as suburban "shopping" grows in popularity; a letter box and where possible a post and telegraph office, should be among the recognised adjuncts of a suburban railway station. The "tea-shop" is being added to most of the more central stations on the Metropolitan line.

The fortuitous, patchwork sort of arrangement of even important suburbs tends not only to inconvenience but to ugliness as well. One of the most prominent features of the suburb we are speaking of is a ragged growth of telegraph poles, confused, untidy collection of gaunt, dismal looking things, so high as to dominate all the foreground near the station, and sustaining a maze of wires. Here, as in other centres of population, the first severe winter which happens to include a heavy snowfall will compel the adoption of some less exposed and more sightly arrangement.

Of another disfigurement, for which far less justification may be pleaded—advertisements—it may truly be said that the suburbs are emulating the town, and in each case it is not the advertisement proper so much as the immense size and needless repetition of names which produces such an offensive and bewildering confusion, running across vertical lines and destructive of all sense of design. West Hampstead is not the only suburb which deserves better treatment in this matter, and it is a pity that no means exist apparently for abating this plague of letters.

R.I.B.A.

The following further results of the annual elections have come to hand:—

Representatives of Allied Societies.—Frederick Batchelor, A.R.H.A. (Royal Institute of the Architects of Ireland); George Bell (Glasgow Institute of Architects); George Thomas Brown (Northern Architectural Association); Arthur Stansfeld Dixon, M.A.Oxon. (Birmingham Architectural Association); Thomas Edgar Eccles (Liverpool Architectural Society); Mowbray A. Green (Bristol Society of Architects).

The Standing Committees.

Art.—Fellows: Walter Henry Brierley, F.S.A.; Edward Guy Dawber; William Flockhart; James Sivewright Gibson; Henry Thomas Hare; Professor William Richard Lethaby; Edwin Landseer Lutyens; Edwin Alfred Rickards; John William Simpson; Paul Waterhouse, M.A.Oxen.—Associates: William Henry Bidlake, M.A.Cantab.; Arthur Thomas Bolton; Sidney Kyffin Greenslade; Thomas Geoffry Lucas; Walter John Tapper; Septimus Warwick.

Literature.—Fellows: Alfred William Stephens Cross, M.A.Cantab.; John Alfred Gotch, F.S.A.; George Hubbard, F.S.A.; Halsey Ralph Ricardo; Professor Frederick Moore Simpson; Professor Ravenscroft Elsey Smith; Richard Phené Spiers, F.S.A.; Henry Heathcote Statham; Charles Harrison Townsend; Paul Waterhouse, M.A.Oxen.—Associates: William Curtis Green; Herbert Passmore; Arthur James Stratton; Harry Inigo Triggs; William Henry Ward, M.A.Cantab.; Percy Leslie Waterhouse, M.A.Cantab.

Practice.—Fellows: William Henry Atkin Berry; Max Clarke; Alfred William Stephens Cross, M.A.Cantab.; George Hubbard, F.S.A.; Sydney Perks, F.S.A.; Alfred Saxon Snell; Henry Tanner, jun.; Thomas Henry Watson; William Henry White; William Woodward.—Associates: Edward Greenop; Edwin Gunn; Edwin Richard Hewitt; Harry John Pearson; Horatio Porter, M.A.Cantab.; Augustus William Tanner.

Science.—Fellows: Harry Percy Adams; Max Clarke; Bernard Dicksee; William Dun; Matthew Garbutt; Francis Hooper; Charles Stanley Peach; Sydney Perks, F.S.A.; Herbert Duncan Searles-Wood; Lewis Solomon.—Associates: Henry William Burrows, F.G.S.; Edwin Richard Hewitt; Alan Edward Munby, M.A.Cantab.; Digby Lewis Solmon, B.Sc.London; Ernest William Malpas Wonnacott; Ernest Alexander Young.

Auditors.—John Hudson; Charles Edward Hutchinson.

At the meeting on June 7th, the following gentlemen were elected:—

As Fellows.

A. T. Bolton (Soane Medallist 1893, Institute Medallist (Essays) 1895), London.

F. D. Clapham, London.

H. A. Crouch (Tite Prizeman 1896), London.

J. S. Heath, London.

E. Skinner, Colombo, Ceylon.

P. L. Waterhouse, M.A.Cantab., London.

As Associates.

D. Macpherson Gordon, Montreal, Canada.

J. C. Morrell, Melbourne, Victoria.

H. B. Richards, Detroit, Michigan, U.S.A.

W. A. Rigg, London.

THE ENGLISH CHURCH PAGEANT.

It would be difficult to say what impressed us most in this striking pageant, which lasted, with an hour's intermission, on the opening day, from just after three o'clock to close upon midnight. With such a feast of colour, with the movement of the crowds, the solemnities of regal pomps, the austerity of the old church music, the delicacy of the child dances, it would be hard if the spectacle failed to move the many thousands of people who have found their way to the beautiful grounds of Fulham Palace. Of the nineteen episodes which set forth the most stirring and epoch-making events in the Church's history, we are inclined to place the sixth scene, Part I. (St. Dunstan and the Monks) as the most dramatic; the tenth scene, Part I. (the miracle play and Pilgrimage) as the most dainty; the second scene, Part II. (funeral procession of Henry V.) as the most impressive, and the fifth scene, Part II. (Coronation procession of Edward VI.) as the most resplendent. The finale, in which the whole of the 4,000 performers troop in from various parts of the beautifully wooded 9-acre stage, holding lighted torches, advance towards the spectators in one great phalanx, slowly retire and at a given signal simultaneously extinguish the lights, terminating the pageant in intense darkness, is one of the most vivid and beautiful effects we remember to have seen. It is an old saying that one volunteer is worth two pressed men, and the voluntary actors and actresses have made the success of the pageant in spite of much physical discomfort occasioned by the heavy rains and cold winds which marred the early days of the pageant, should be accorded every praise for their zeal and hard work. If what we hear is true, many of them have been ill-requited by bad colds and attacks of pneumonia. The spectators' stand, which holds some 7,000 people, was we may mention, designed by Mr. A. O. Collard, F.R.I.B.A. It would be impossible to enumerate all the numerous gentlemen through whose efforts this great spectacle has been produced. The organisation, commenced by Mr. Frank Lascelles and completed by Mr. Hugh Moss, was excellent, as witness the first performances which went through without a hitch, albeit they were too long. Since the first day the blue pencil has been used with some effect, and the whole pageant now plays "closer" and with better grip. There are still three days in which to see it, and we would advise those who can to make a point of going to see it.

The Climbers. "Resolved—That the Borough Surveyor obtain tenders for dashing up the walls of this property, and submit same to the next meeting."—"Local Paper." We beg to submit a tender of five pounds to see him do it.—"Punch."

* * *

The state of Winchester Cathedral is still a subject of anxiety. Mr. T. G. Jackson, R.A., and Mr. Francis Fox, advise that it is necessary to erect buttresses in order to ensure the safety of the cathedral. Mr. Jackson reports that all the tests on the cracks of the wall of the south nave aisle have broken successively between December, 1906, and April, 1909, the older tell-tales now showing fissures of one-eighth of an inch or more, while the south doorway, which is modern, and was built upright into a leaning wall, now inclines outwards 1in. in 14ft. It is therefore evident that movement in this wall is still continuing, and Mr. Jackson thinks that instead of underpinning the wall and inserting iron ties across the aisle, as at first proposed, it would be far better to buttress the wall. Mr. Fox agrees that the external buttresses designed by Mr. Jackson should be adopted and will give the required strength. This provision will necessitate an additional expenditure of £800.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

Repairing Portland Stone Work.

LONDON, S.E.—RETSBEW writes: "Can you give me a recipe for a mortar to be used in refacing Portland-stone strings, cornices, and mouldings, where spalled or deteriorated? It is understood that Portland-stone dust and Portland-cement, with the addition of a chemical compound, have been found very successful. The proportions of the mixture and the name of the chemicals used would oblige."

I do not know the mixture referred to, but possibly the manufacturers of Portland cement who advertise in this journal may be able to give you the information, as they have a connection among people likely to know. Chipped stone is sometimes repaired by fixing the piece broken off with mastic; at other times a rectangular portion is cut out, and a new piece let in, and in special work the whole stone is cut out and another put in its place. HENRY ADAMS.

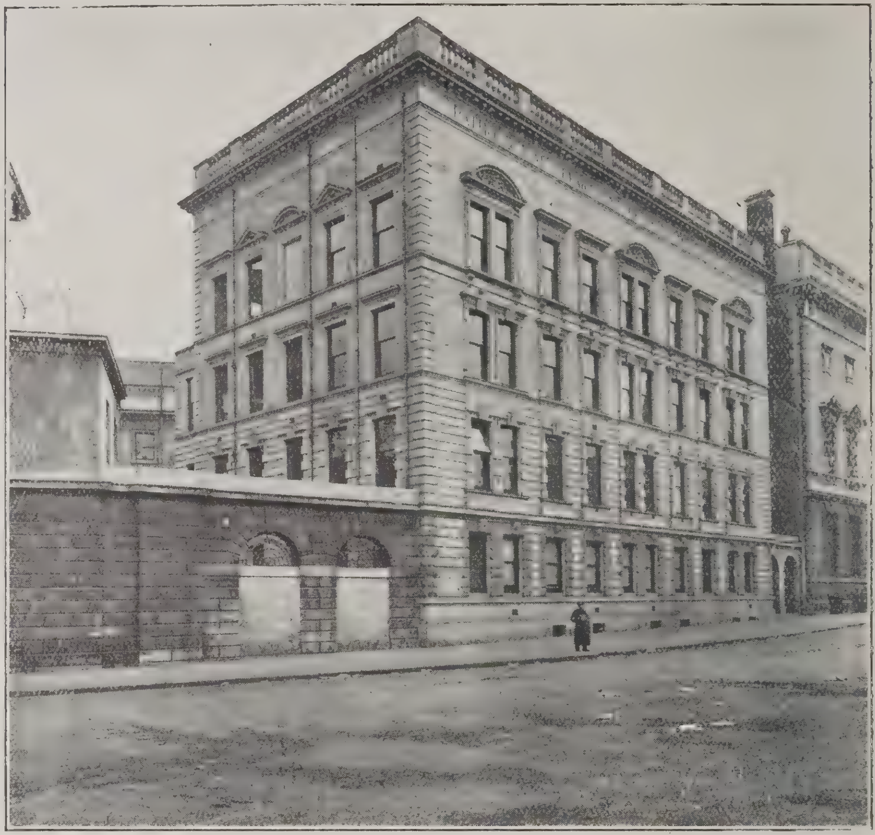


Photo: *Topical.*

NEW PATHOLOGICAL BLOCK, ST. BARTHOLOMEW'S HOSPITAL, LONDON. FRONT ELEVATION.
E. B. I'ANSON, F.R.I.B.A., ARCHITECT.

This building has a frontage of 90 feet to Smithfield, and occupies an area of 4,450 superficial feet. The floors and roof are of fire-resisting construction, and the fronts are faced with Portland stone, with grey granite plinth.

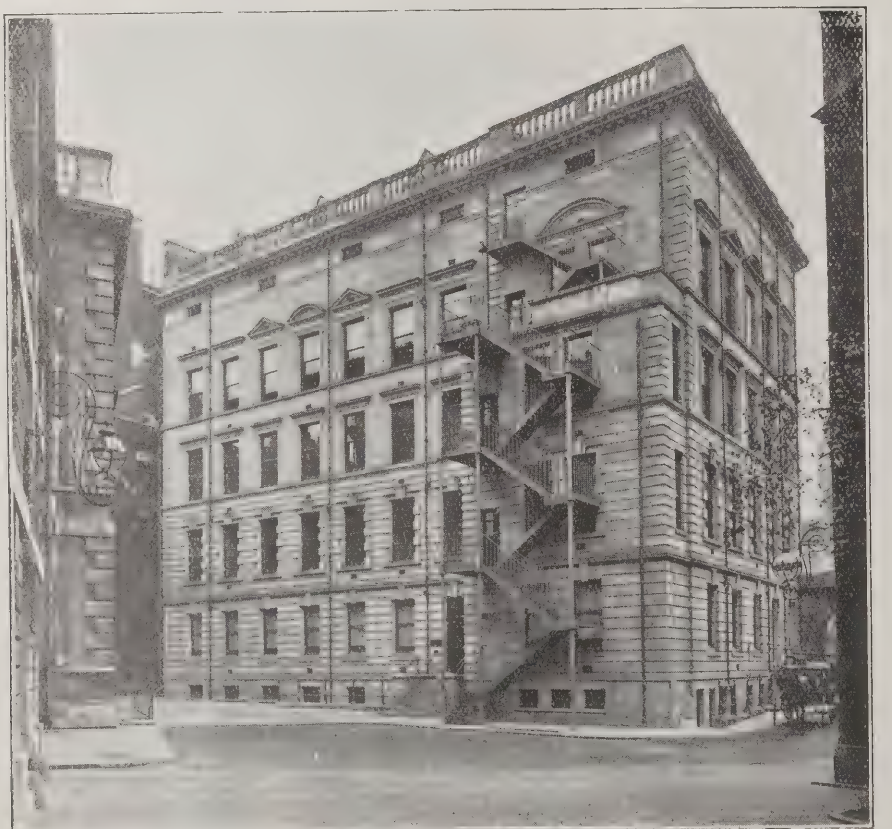


Photo: *Topical.*

NEW PATHOLOGICAL BLOCK, ST. BARTHOLOMEW'S HOSPITAL, LONDON. BACK ELEVATION.
E. B. I'ANSON, F.R.I.B.A., ARCHITECT.

The building is warmed by low pressure ventilating radiators, and air extraction is effected by fans electrically driven. Electric lighting has been installed throughout, and the building is in telephonic communication with other departments of the hospital.

Board of Education Examination.

BASINGSTOKE.—STUDENT writes: "Having sat for Stage 3 in Building Construction, I understand it is necessary to pass an examination in Architecture before sitting for honours."

"Student" is correct in understanding that it is necessary to pass the Board of Education's examination in Architecture before being allowed to sit for their examination in the Honours Stage of Building Construction. The syllabus of the Architecture examination includes the influence of construction, materials, and social conditions on the styles, and students are advised to study from actual buildings by sketching and measuring, mouldings and details being specially emphasised. The examination includes questions on Greek, Roman, and English architectural styles, and the meaning of architectural terms. Full particulars are published as follows:—Syllabuses of all Science and Art subjects, price fourpence; and Examination Papers in all Art subjects, price sixpence, exclusive of postage. These can be obtained from Messrs. Eyre and Spottiswoode, East Harding Street, E.C. The examinations are held each May in connection with almost all the technical and art schools in the country, and inquiry should be made of the master of the nearest school of the kind in "Student's" own district. Probably he would sit at the same centre as for his previous examination in Stage 3 of Building Construction. B. and B.

Validity of Conditions of Land Purchase.

BIRTLEY.—BRICK writes: "I bought 4½ acres of building land some 9 years ago. One of the conditions was that no houses in flats should be built on the land. Can the vendors enforce this condition?"

Certainly the vendors can enforce such a condition as this if they so wish. Moreover, if they have sold their estate in lots, all the lots carrying the same restriction, the vendors have no powers to allow any one purchaser to depart from the conditions. If they did so, the other purchasers might suffer an injury. Building regulations are intended for the mutual protection of all the parties, and are not for the vendor's benefit only.

F.S.I.

Books on Land and Estate Agency.

STOCKPORT.—W. T. G. writes: "I should be extremely obliged if you could give me a list of suitable books on land and estate agency, collection of rents, etc., etc."

The Surveyors' Institute issued a very good list of books suitable for the use of students, and a letter to the Secretary, at 12, Great George Street, Westminster, with a remittance of 1s. 6d., would secure you the syllabus of examinations (including this list). It is a little difficult in a short space to name just the books you require, but I select (as having used them myself) for land agency, "Curtis' Estate Management," published at the "Field" office at 10s. 6d. For rents and payments, Mitchell's "Rates, Taxes, etc.," published by E. Wilson, 54, Threadneedle Street, E.C., at 3s. 6d. For law of landlord and (tenant, Houldsworth' "Landlord and Tenant," published by Routledge and Co., at 1s. There are, of course, many other textbooks which may be consulted with advantage, though some of them are rather expensive.

F.S.I.

Surveying Plots of Land.

CO. CORK.—PLOT writes:—"In surveying half-acre or acre plots, how would you find the required area or position of new fences or boundary required?"

To set out a certain area upon the ground, one would first survey the existing fences, or other physical features, plot them to a fairly large scale upon paper, and then set out, by trial, on the plan, the exact area required. After this, it becomes merely a matter of calculation (or scaling) of the lengths and positions of the sides which are to be staked out upon the ground. The instances you submit are quite simply worked out this:—(a) A half-acre (=50,000 square links) plot with all its angles rectangular, and having a frontage of 1.25 chains, will have a depth which will be equal to:— 50,000÷125=400 links,

∴ stake out the frontage first, erect perpendiculars by means of a builder's "square" or by the chain method, and stake out the side lines each four chains in length. (b) A rectangular plot containing an acre (100,000 square links) with one corner cut off and having the length of one frontage given. Calculate the length of the required side in the same way as in case (a), and as though the plot were simply rectangular; then (from the plan) calculate the area of the triangular piece (base × half the perpendicular), which is not included in the actual plot, and add a narrow strip on the straight side of the plot to make up the missing area. (c) This problem may be solved in almost exactly the same way as described for (b), working similarly from the plan to the ground.

F.S.I.

Fireplace Openings.

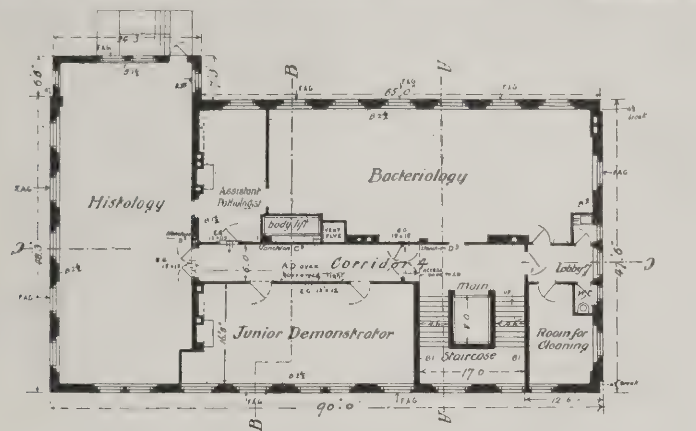
CO. CORK.—PLOT writes:—"What is the proper size for a fireplace opening and flue for an open-hearth fireplace, with a blower and hanging crane, for a farmer's house? Should the flue be straight?"

I know of no "proper size" for an open fireplace, and as a matter of fact, in the South of England we have them of widely varying sizes. From 2ft. 6in. to 4ft. deep, and from 5ft. to 10ft. wide are quite usual dimensions in this district (Sussex). The flues are usually nearly straight, being merely a little curved, in order to prevent the rain falling directly on to the fire, and I am bound to confess that these fireplaces almost invariably smoke badly, and are being rapidly superseded by modern grates. I can suggest no improvement in the design of the open hearth you submit, except that 1ft. 11in. for the depth appears to be small (perhaps you have a projecting hood increasing this). The defect is of course that of insufficiency of draught (you no doubt find that if the door and window be opened, the smoke will go up the chimney as it should), and this defect is, I fear, a fatal one—it can only be remedied by contracting the opening at the base of the chimney (which practically means putting in a close fire-grate)—no good whatever can be done by pots or cowls—in fact, in ninety-nine cases out of a hundred the fault causing a smoky chimney is at the foot and not at the top of the flue.

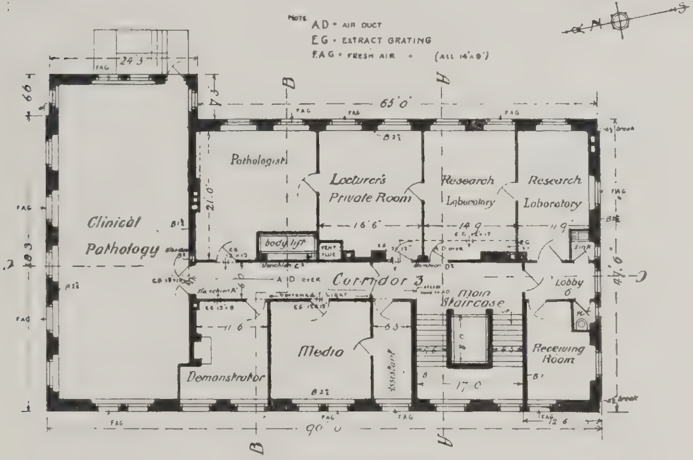
F.S.I.

Rejection of Materials.

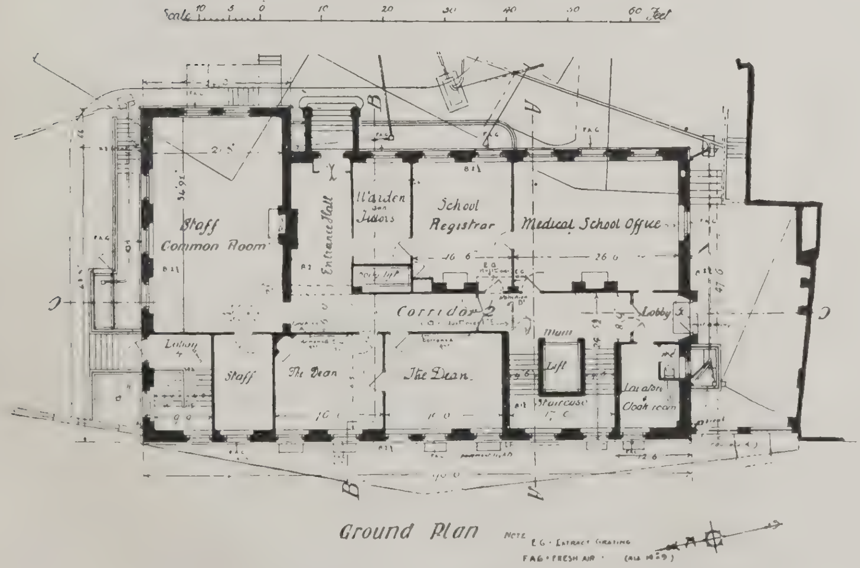
PROVINCES.—H. E. B.—In answer to this correspondent, a contributor writes: "It depends on the wording of the contract. If querist's clients are employing an engineer, and the conditions give the engineer power to reject any material which he considers not up to the standard, I fear you have no remedy; but in view of your offer to submit the pipes to a much higher test than that imposed by the conditions, I think that the committee are acting unreasonably. It very much depends on the nature of the contract you have with them."



Second Floor Plan



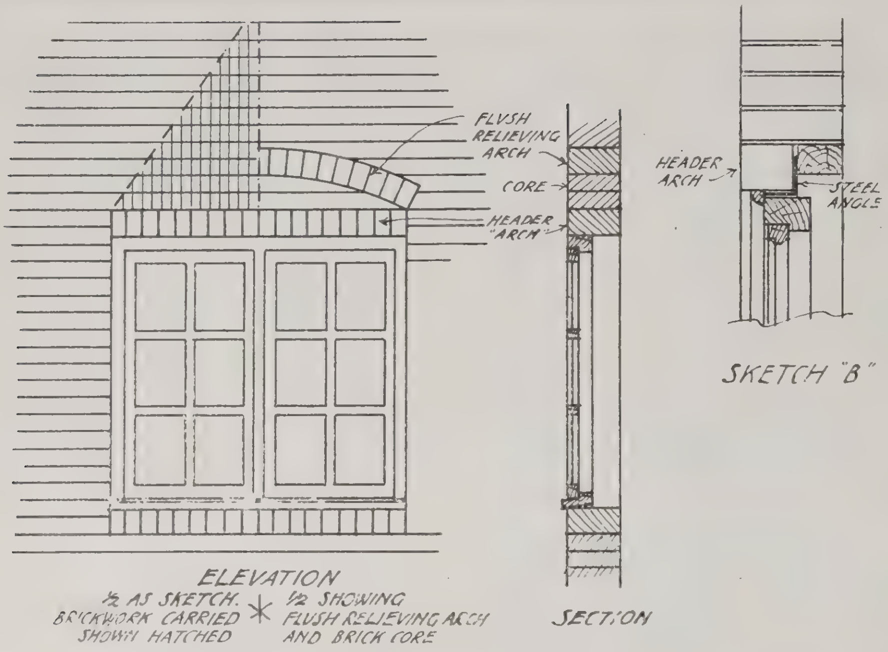
First Floor Plan



Ground Plan

NEW PATHOLOGICAL BLOCK, ST. BARTHOLOMEW'S HOSPITAL, LONDON. PLANS.
E. B. I'ANSON, F.R.I.B.A., ARCHITECT.

The Mortuary Chapel and the Mortuary are in the basement, cut off from the other part of the building, and approached from without by a separate entrance and staircase. The ground floor is occupied by certain administrative offices, and on the first, second, and third floors are Laboratories for Clinical Pathology, Special Research, Histology, Bacteriology, and Chemical Pathology. On the third floor there is a Pathological Library. The Laboratories are fitted with all the most modern appliances and scientific apparatus. The Post-mortem room is on the top floor, and an electric lift puts it into direct communication with the Mortuary, and there is also an electric passenger lift in the well of the staircase.


FLUSH RELIEVING ARCH
CORE
HEADER "ARCH"
HEADER ARCH
STEEL ANGLE
SKETCH "B"
ELEVATION
½ AS SKETCH. BRICKWORK CARRIED SHOWN HATCHED
½ SHOWING FLUSH RELIEVING ARCH AND BRICK CORE
SECTION

ILLUSTRATING REPLY TO "NEWPORT (SALOP):—HEADERS."

Construction to Header Arches.

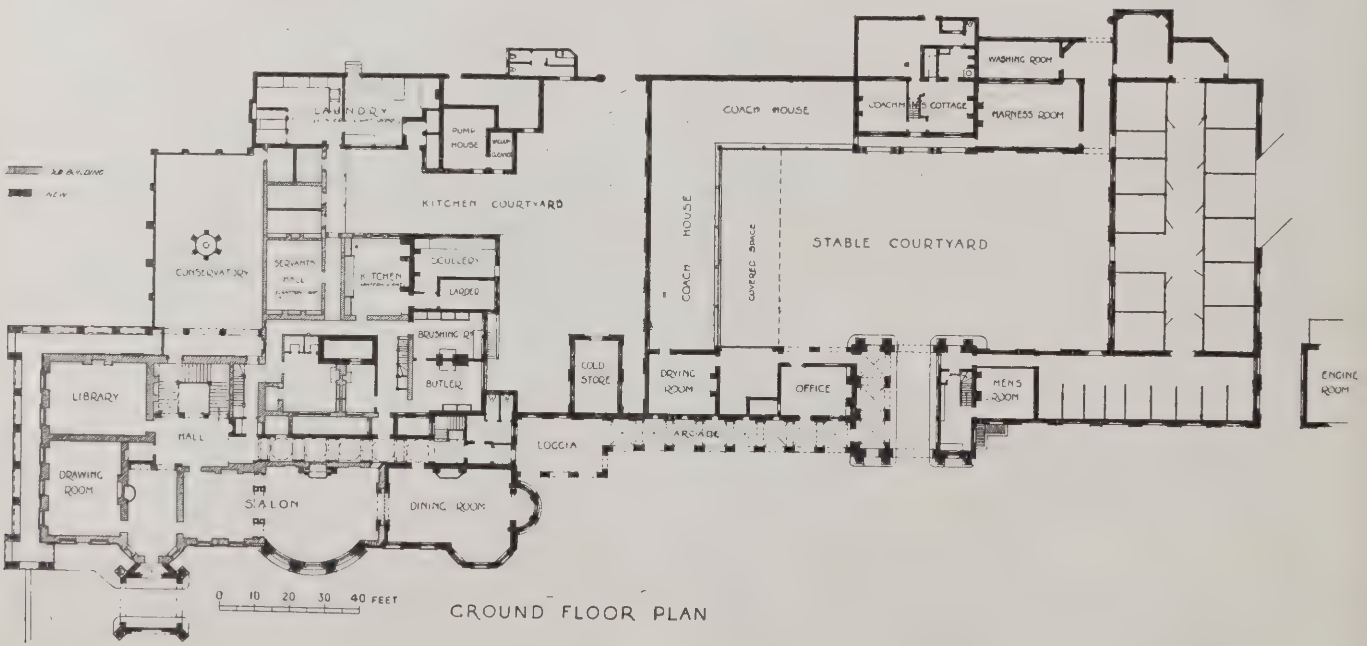
NEWPORT (SALOP). — HEADERS writes: "Please describe the method of constructing the exterior arches that are shown on drawings as header bricks. What carries the brickwork above?"

The header arches are sustained by a cement joggle formed by grouting between the bricks with liquid cement, the frog of the brick forming the requisite key on one side, and a rough sinking being formed with a chisel on the other side. The headers either rest on the window head (if solid frames are used) or on a temporary turning piece, and the construction is quite sound, and capable of independently maintaining the triangle of brickwork above, up to a span of about 4ft. 6in. Beyond that span a relieving arch should always be used, and the bricks are also sometimes threaded on an iron rod or supported by an angle iron, as sketch B, but neither of these expedients is really good construction. If casements with stout mullions are used, however, there is no good reason why wider openings should not be spanned in this way, as the frames are equal to carrying the brickwork over, if the latter is only of the thickness usual in ordinary domestic work and has the ordinary rough arch inside.

Our Plate.

Sennowe Park, Norfolk.

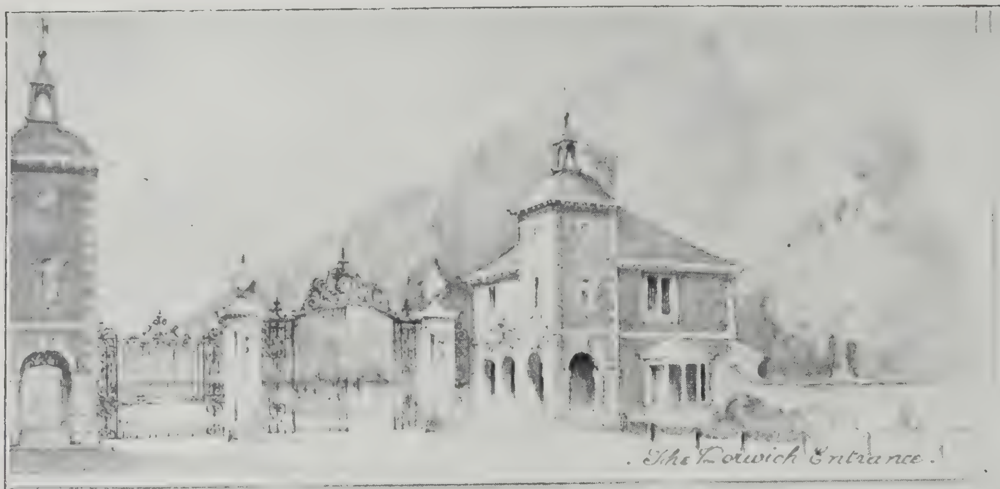
Extensive additions and alterations to Sennowe Park have been in progress, to fit it for the residence of Mr. T. A. Cook. The view which we illustrate this week shows the nature of the work on the east, or entrance, front, commencing with the carriage entrance to the stable courtyard, and the arcade leading to the loggia connecting the stables with the Hall; and in the background rising from the trees is seen the upper part of the water tower and belfry stage. From the plans, the scheme will be seen to embrace not only very large additions to the Hall itself, but the complete rebuilding of the stables and coach-houses, provision for motor garage and electrical plant, and an entirely new winter-garden, laundry, etc.; but, beyond these very large extensions, the terrace gardens have been greatly added to, and the whole of the entrance forecourt has been formed; the gardens have been enlarged by an extensive rose garden, and, beyond this, a water-garden leading to a pergola, thus connecting the principal grounds with a rhododendron walk running near the trout stream, crossing it, and extending itself quite round the other side of a newly formed lake of some 8 or 9 acres in extent. All the drives have been practically re-formed, and new approaches have been made through the plantations to the Hall, connecting them up to the pine avenue which leads from the Hall past the gamekeeper's cottage to two new lodges known as the "Ryburgh Gates." In an opposite direction an entirely new avenue, some three-quarters of a mile in length, and of a width of about 120ft., with double sets of elms and grass galloping tracks on either side of the broad carriage road, leads from the park to the entrance known as the "Norwich Gates," where two other lodges have been built. The whole of the building is now in a very advanced stage. The main reception rooms are being finished off in oak and hard woods, and a saloon some 55ft. long is being carried out in Italian walnut. Mr. George Riches, of Cromer, is the general contractor for the work, whilst the whole of the stonework has been carried out by Mr. E. W. D. Potter, of Norwich. The exterior stone carving has been executed by Messrs. Farmer and Brindley, of Westminster; the carved oak staircase by Messrs. Martyn, of Cheltenham; and the decorative figure painting for the interior by Mr. George Murray and Mr. W. J. Neatby, both of London. Sculptured work in the conservatory and gardens has been carried out by Mr. H. C. Fehr. The stable fittings and heating were carried out by Messrs. Musgrave and Co., of Belfast and London. The iron gates at the Ryburgh entrance have been made by Messrs. Singer, of Frome, and the Norwich Gates by Messrs. Hardman, Powell and Co., of Birmingham. Messrs. Wm. Paul and Son, of Waltham Cross, have carried out the whole of the garden works. The formation of the lake, the terrace gardens, and the whole of the road work, has been carried out by Messrs. Mornement and Ray, of East Harling. The whole of the undertaking, including the gardens and road works, as also the interior decorations, is being carried out from the designs and under the superintendence of Messrs. George J. Skipper, F.R.I.B.A., and F. W. Skipper, architects, of Norwich.

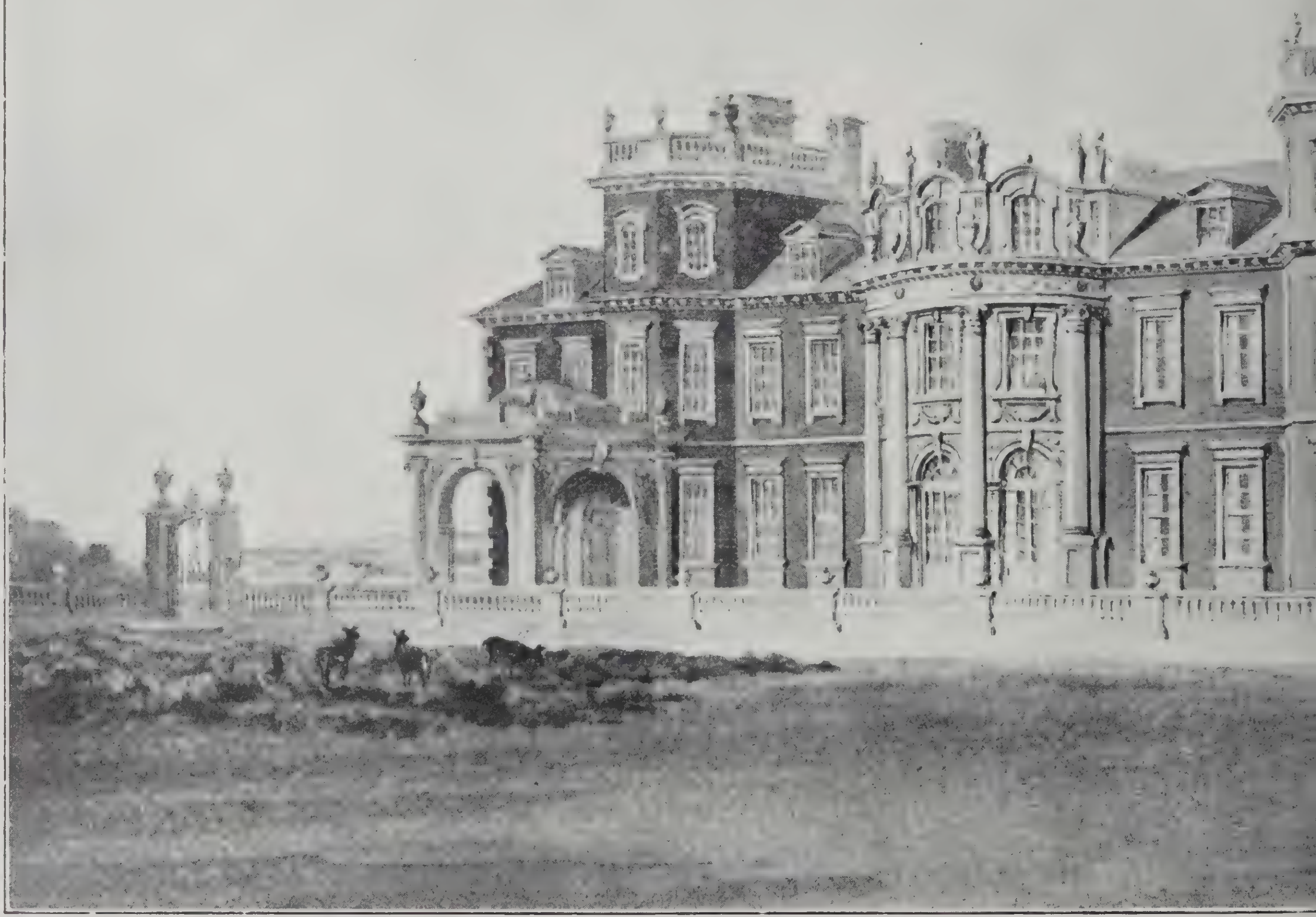


ALTERATIONS AND ADDITIONS TO SENNOWE HALL, NORFOLK. G. J. AND F. W. SKIPPER, FF.R.I.B.A., ARCHITECTS.

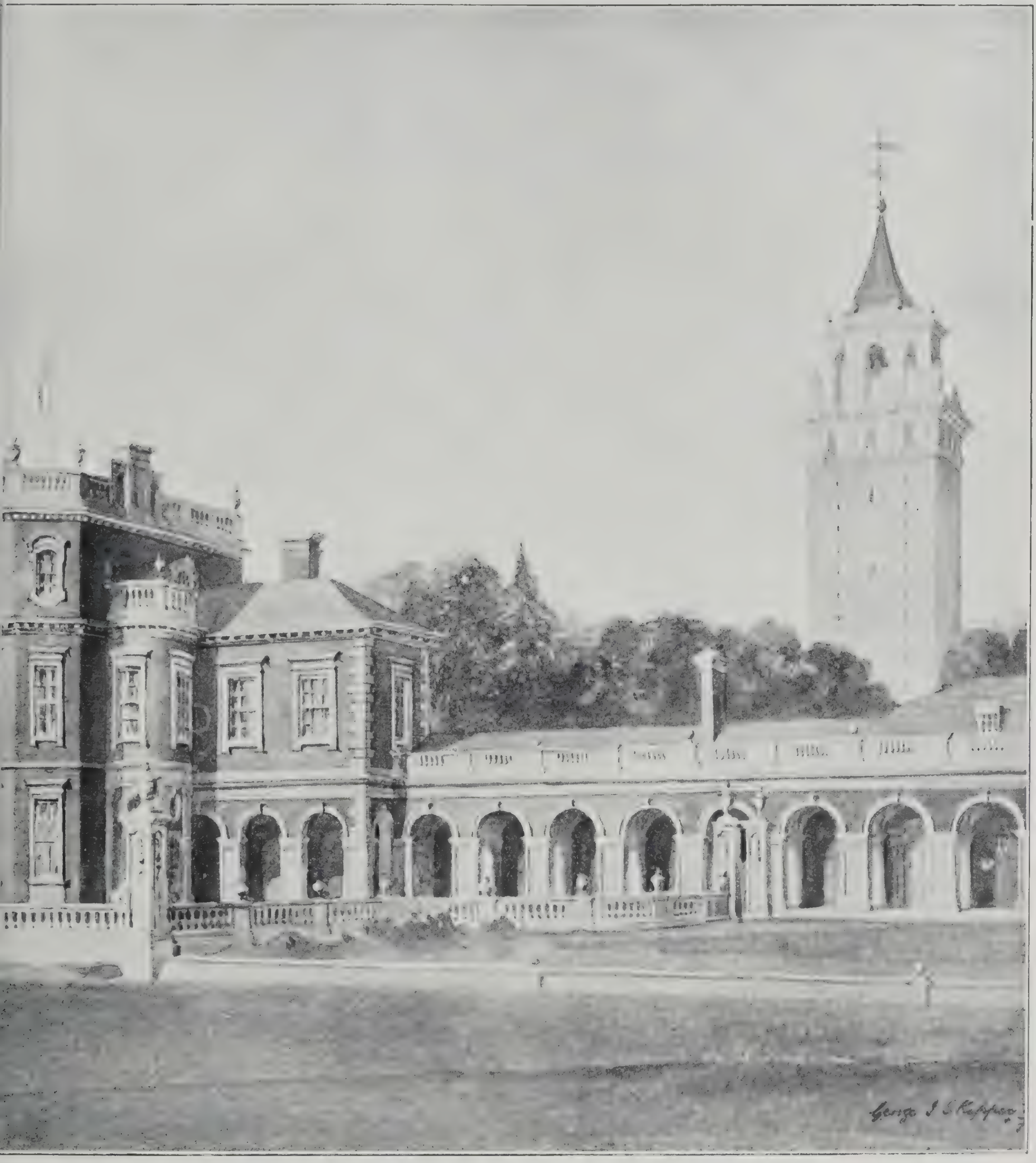
The extensive additions and alterations to the Hall at Sennowe Park are indicated on the plan above, and in the view shown on our Centre Plate. Very extensive works have also been carried out in the Park, including a new rose garden, water garden, and lake, some eight or nine acres in extent. The drives have been re-formed, a new avenue formed, and two new lodges built, known as the Ryburgh Gates. The Park surrounding the house is very beautifully wooded.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS


The Norwich Entrance.

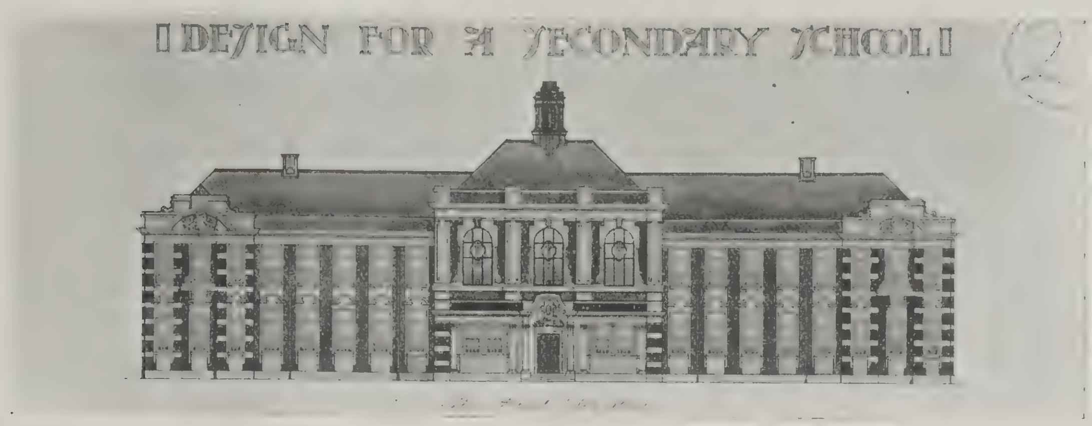


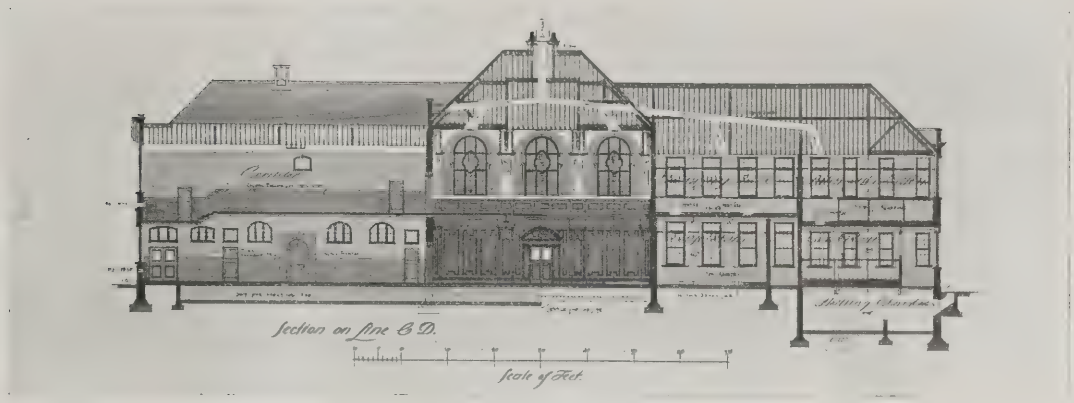
ALTERATIONS AND ADDITIONS TO SENNOWE HALL, NORFOLK.

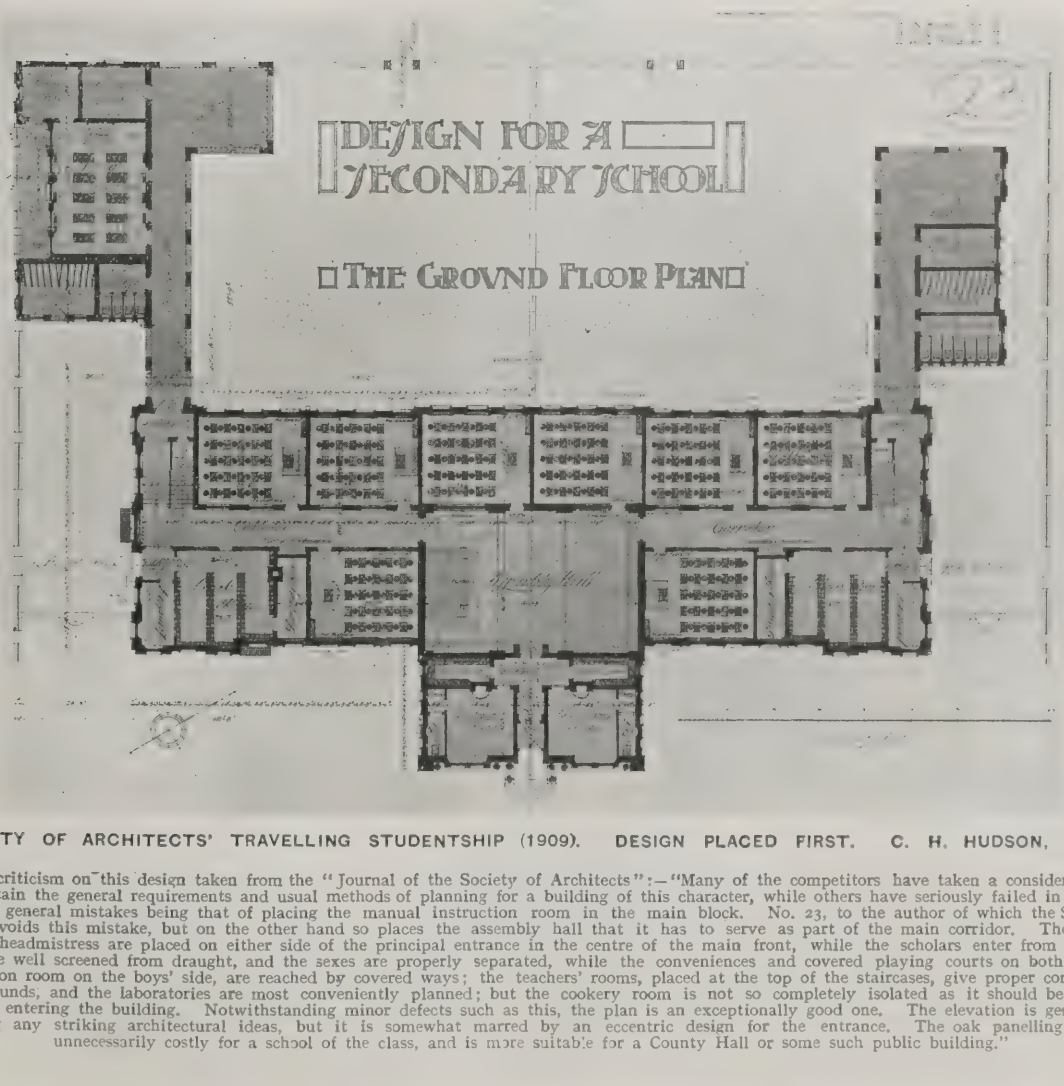


IE EAST FRONT. G. J. AND F. W. SKIPPER, FF.R.I.B.A., ARCHITECTS.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS







THE SOCIETY OF ARCHITECTS' TRAVELLING STUDENTSHIP (1909). DESIGN PLACED FIRST. C. H. HUDSON, ARCHITECT.

We append the criticism on this design taken from the "Journal of the Society of Architects":—"Many of the competitors have taken a considerable amount of trouble to ascertain the general requirements and usual methods of planning for a building of this character, while others have seriously failed in this particular, one of the most general mistakes being that of placing the manual instruction room in the main block. No. 23, to the author of which the Studentship has been awarded, avoids this mistake, but on the other hand so places the assembly hall that it has to serve as part of the main corridor. The rooms for the headmaster and headmistress are placed on either side of the principal entrance in the centre of the main front, while the scholars enter from the side rooms. The corridors are well screened from draught, and the sexes are properly separated, while the conveniences and covered playing courts on both sides, and the manual instruction room on the boys' side, are reached by covered ways; the teachers' rooms, placed at the top of the staircases, give proper control, and overlook the playgrounds, and the laboratories are most conveniently planned; but the cookery room is not so completely isolated as it should be to prevent the smell of cooking entering the building. Notwithstanding minor defects such as this, the plan is an exceptionally good one. The elevation is generally suitable without showing any striking architectural ideas, but it is somewhat marred by an eccentric design for the entrance. The oak panelling of the hall is unnecessarily costly for a school of the class, and is more suitable for a County Hall or some such public building."

A SIMPLE PLANIMETER.

By A. E. Fletcher, M.S.E.

The instrument herewith illustrated is designed to measure areas bounded by curved or irregular lines, and is on the same principle and similar to one which the writer saw described in a Continental manufacturer's list. The original was of sheet copper, and was constructed for metric units, but a little investigation soon revealed the principles of its design, and the one shown was cut out in thin hard card, from the ordinates calculated and given on the diagram (Fig. 1). The method of using it is as follows:—A pin is put approximately in the centre of the area to be measured, as in Fig. 2, or in such a position that when the square is turned round it will reach to all parts of the figure. Starting from any position, the perimeter is marked with a pencil, where it cuts the edges of the figure on both sides, and then it is moved forward till the back edge coincides with the last mark, and another mark is made. In this manner the perimeter is divided all round, and were lines to be drawn to the centre the figure would be divided into a number of triangles, all of which are of equal area. This area is a constant depending on the construction of the planimeter.

For the square shown in Fig. 1, and of the dimensions there given, this constant is 2½ins. when used to a centre, or 5ins. when used to a base line.

Fig. 3 illustrates the method of using the square for measuring areas bounded on one side by a straight base line; but each of the rectangles marked off has an area of twice what would be given if the instrument were worked from a centre point within the boundary of the figure. The constant for the rectangles for the square shown is therefore 5ins. Should it be found when dividing up the perimeter that there is a fractional space between the first mark made and the last one, it is estimated by taking it off with dividers as a decimal fraction of the last space marked; or, more accurately still, as a decimal part of the mean width of the spaces on either side of it.

For example, let it be supposed that in Fig. 2 the square has marked off 42 divisions on the perimeter, and a remainder which is estimated as the decimal .3 of the divisions on either side of it. The area of the figure would then be=42.3×2½ins. (constant)=105.75 sq. in. Assuming the drawing to represent a field plotted to ¼in. scale, its area would be= actual area × scale 2=(4^2)=1692ft. super. In the other (Fig. 3), where, measuring from a base line, the constant is 5ins., the area in feet super. of the figure represented would be = number of rectangles × constant (5) × scale 2 in parts of an inch to one foot.

The accuracy obtainable with these squares is probably greater than most people would secure by the frequently used method of averaging the curved lines, and it depends upon the care with which the curve is set out, the exactness of marking the divisions, and the largeness of the scale worked to, and it is greater in proportion to the smallness of the divisions on the perimeter.

For the ordinary small scales used by surveyors, a much smaller square would be proportionately more accurate, set out to give constants of say ½in. and 1in, when used respectively from a centre, or on a base line. Such setting out is an exceedingly simple matter when the principle which the properties of the square depends upon are understood. The curved sides of the figure are hyperbolic curves, and the use of the square depends upon a property of the hyperbola which Fig. 4 will recall to the reader.

$XY=XY=xy$; i.e., any ordinate multiplied by its abscissa X will give a constant area (equal to XY) and y therefore for any abscissa will equal $\frac{XY}{x}$.

The ordinates of a figure bounded by a hyperbolic curve can thus be easily calcudated by simple division to give a constant of xy=any given magnitude, and it is easily seen that such a figure will mark off at different distances x ordinates y of such proportionate breadth as will give rectangles of constant area, indicated in Fig. 4 by the figure *abcd*, or equal triangles of half this area *bcd* if we are measuring from a point *d* instead of a base line. For convenience we plot the ordinates y, when calculated, evenly each side of a centre line.

To make the matter quite clear, the method by which the square shown of constant 5 was calculated is as follows. It was plotted on squared paper in tenths of an inch. Starting from the zero point z, the ordinates at point 10, which is 10-tenths of an inch or 1, must be $\frac{5}{1}$ or 5ins., which is divided on each side of centre line, 2½ins. each side. The ordinates at abscissæ less than 1 (7, 8, 9, tenths), would of course be more than 5, but it is assumed that in no case the perimeter will come nearer to the base line than 1; and at this point the square is cut off straight to the base line. It is extended a little beyond the actual base line to permit of cutting a notch for the pin to rest in, so that it shall come right on the base or zero point. At abscissa No. 20, viz., 2ins., the ordinate will be 5/2=2½ins. spaced 1.25 each side of centre line. At 2.5ins. it will be 5/2.5=2ins.; at 3.6 it will be 5/3.6=1.38; set off .69 each side of lime, and at 102=5/10=.5in., or .25in. each side. The points of the curves are plotted in this manner for each tenth of an inch, except for the higher abscissæ, where the curvature is so small that points ½in. apart are sufficient. The points are then joined in a fine curve. When plotting, it will be understood that the squared paper is used as a scale of decimal parts, the ordinates being easily picked off; and although this description is necessarily tedious, the plotting of such a square is really a very easy and simple matter; and the instrument when made is a very useful possession.

The earthquake that occurred in Provence on Friday night last destroyed five villages, but the particulars at present to hand are very meagre with respect to the buildings that have been reduced to ruins. Fortunately, the district affected contains no large towns. It is stated that in the old quarters of Lambesc, which are very congested, not a house is left standing whole. At St. Cannat, the belfry of the village church falling, caused the death of two men, and it is feared that the loss of life, of which full details have not yet been ascertained, has been very considerable.

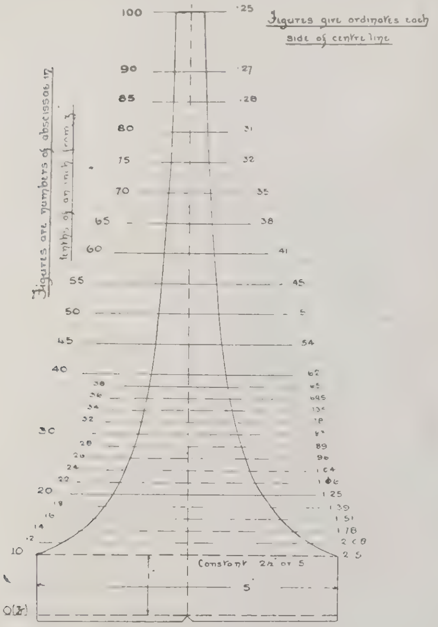

Figures give ordinates each side of centre line
Figures are numbers of abscissae in tenths of an inch from Z
100
90
85
80
75
70
65
60
55
50
45
40
30
20
10
O(Z)
·25
·27
·28
·31
·32
·35
·38
·41
·45
·5
·54
·62
1 25
1 39
1 51
1 78
2 5
Constant 2½ or 5
5

FIG. 1.

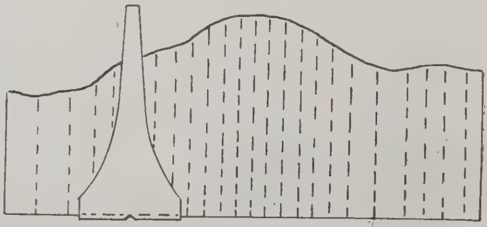


FIG. 3.—METHOD OF USING SQUARE ON BASE LINE.

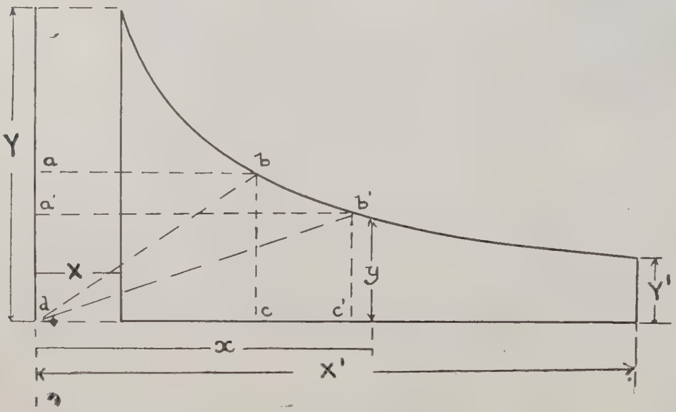


FIG. 4.—THE HYPERBOLA.

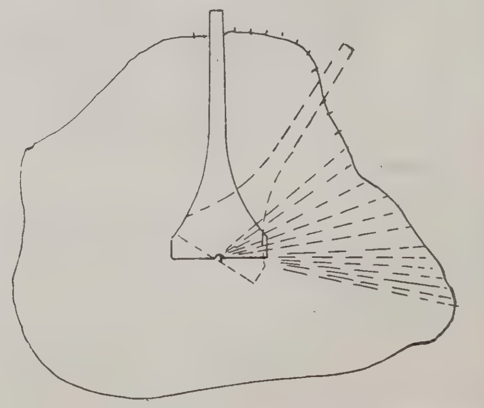


FIG. 2.—METHOD OF USING SQUARE.

Trade and Craft.

Kerno Specialities.

A booklet issued by Messrs. Kerner Greenwood and Co., timber importers, King's Lynn, has on its cover a sketch of a cottage in which the half-timbering and fencing are treated with light-brown Kerno, the barge-boards and bay with the same in light green, the gate and posts with blue-green, and the wood shingles with red. Kerno is described as a strong antiseptic fluid, which, when brushed on to any kind of timber, penetrates into the pores of the wood, coagulates the albumen, and renders impossible the existence of vegetable matter. It is not merely an agreeable stain, but a preservative and disinfectant. Kerno mastic is described as an effective damp-proof and rust-proof solution for use on all ironwork and steelwork, and for application to very damp walls. It is a brilliant shiny black.

Instruments, Appliances and Materials for Surveyors and Draughtsmen.

A comprehensive catalogue of surveying instruments, drawing instruments, drawing materials, photo processes, photo apparatus, and office stationery, has been issued by Messrs. Norton and Gregory, Ltd., of Castle Lane, Buckingham Gate, Westminster, and 34, Robertson Street, Glasgow. The section devoted to surveying instruments includes the firm's new pattern solid uprights for theodolites. For these uprights it is claimed that not only are they more rigid than the old open-frame kind, but, being made all in one casting, are less likely to get out of order through the loosening of screws, wearing of parts, etc. With the same object in view, the firm have introduced the solid-base engineer's level, in which the base and telescope are cast in one piece. Other new lines in this department are the bamboo ranging poles, which are commendable for their lightness, and the patented new marking of steel measuring chains and tapes. Among the drawing instruments and appliances are listed some ingeniously constructed adjustable drawing tables, a patent roller-bearing drawing cabinet, extra-thick violet-tint transparent celluloid goods, and the patent Roto-Rule, a small pocket calculator that is not liable to get out of order. The drawing materials section includes a very complete list of drawing papers, tracing papers, and tracing cloths, as well as the Velography system of reproducing plans, etc., in facsimile. Notable also in this section are the ferro-carbon papers and ferro-Prussiate linen. The list of sundries appears to include everything of the kind that can be required for office use, and the catalogue as a whole is extremely serviceable.

Views and Reviews.

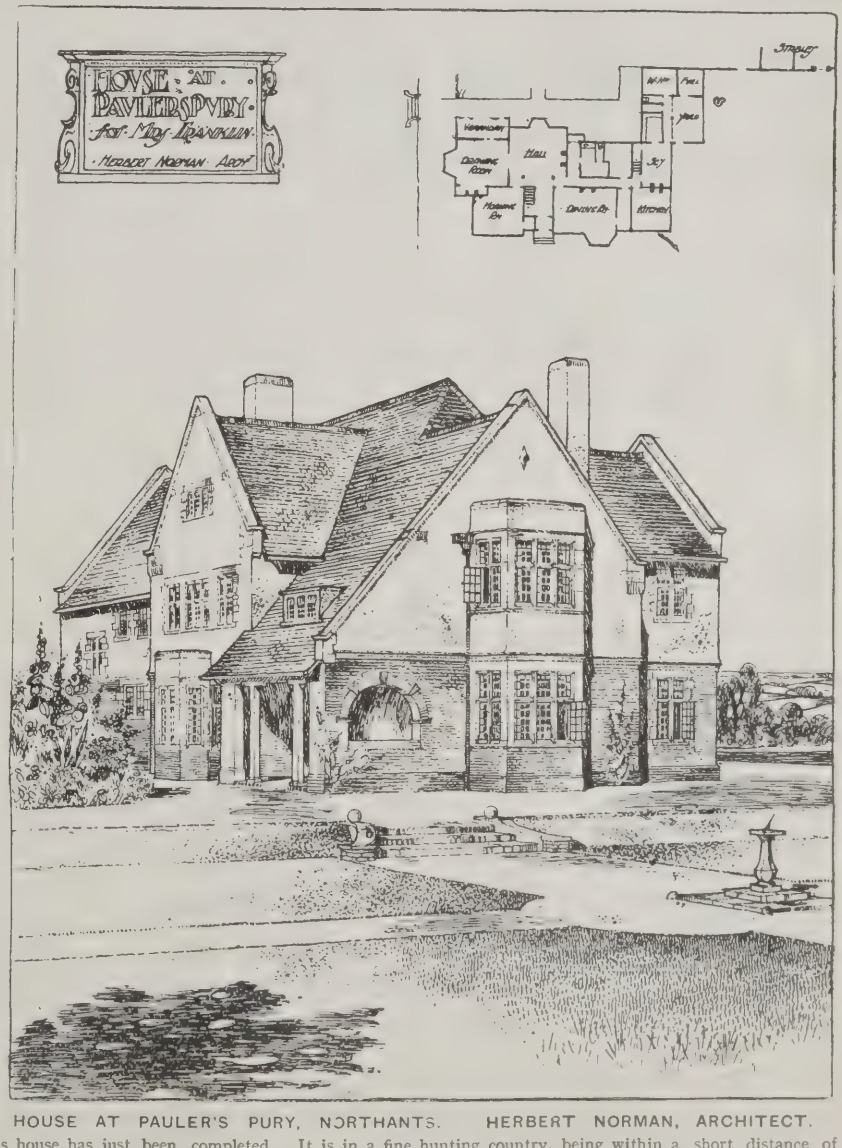
A Handbook on Marble and Marble Working.

Marble and Marble Working. A handbook for Architects, Sculptors, Marble Quarry Owners and Workers, and all engaged in the Building and Decorative Industries. By W. G. Renwick. With numerous illustrations and coloured plates. Pages xiv.+226. Price 15s. London: Crosby, Lockwood and Son, 7, Stationers' Hall Court, Ludgate Hill. 1909.

It is doubtless owing to vastly improved facilities for transport that, during comparatively recent years, the use of marble has extended prodigiously. It is to be feared that many of the architects who specify the material know but little about it, and hitherto their excuse has been that the sources of information have been lacking. Mr. Renwick's book invalidates this plea. It puts the architect in possession of all that he can be reasonably expected to know about marble—what it is how and where it is quarried, and how its selection for various uses should be governed.

What is marble? The geologist may hold that the definition includes nothing but metamorphosed limestone; but Mr. Renwick, while recognising the limitation imposed by the man of science, is constrained to adopt the less stringent view, which will be found generally acceptable for practical purposes, that the term marble includes "any natural stone that is of less hardness than granite, having a sufficiently close texture to take and retain a polished face, and being produced in such quantity as to be available for use for decorative purposes." The fundamental element in geological marbles is calcium, which, in combination with carbon dioxide and oxygen, forms the mineral calcite (C_aCO_3). The natural process, effected by heat and strain, which is known as marmorosis, does not affect its chemical composition, but the metamorphosed rock becomes highly crystalline in structure and acquires increased density. Of course no marble is chemically pure; and it is the presence of foreign material, in the form of carbonates and oxides, that gives the figuring and veining of coloured marbles; the iron oxides giving the yellow, pink, and red shades; the bluish-grey to black being generally due to the presence of carbonaceous matter; the greens, to the intrusion of iron and copper sulphides, mica, and talc.

The use of marble is of great antiquity. The quarries of Carrara (of which the name derives from the Latin *Quarrariæ*) were being worked by the Romans about 173 B.C. The quarries from which modern supplies are derived are situated in almost every country in Europe—Italy, France, Belgium, Greece, Portugal, Sweden, Austria, Spain, Switzerland, and Germany, and several varieties are quarried in Devonshire, Derbyshire, Cumberland, the Western Hebrides, and the South and West of Ireland. America and the Colonies also add something to the supply. Many quarries, at home and abroad, and the methods of working them, are illustrated in the book; Chapter III. giving an interesting account of the machinery used, and compares the European and American systems of working, while in other chapters the systems of various countries are described with sufficient fulness and clearness, and quite copious illustrations. Marble working as a British industry occupies a whole chapter; another being devoted to practical points for the consideration of architects, and hints on the selection of marble. A list of marbles in ordinary use, with descriptive notes, and instances of the application of the different kinds of marble, fills thirty-five pages. Some of the most beautiful marbles are shown in fac simile in a series of excellent coloured plates. A chapter on marble substitutes and imitations is included; and among the very numerous illustrations are several views of buildings in which marble has been effectively used. The book is of great interest and of unquestionable utility, the information it affords being of the right quantity and the right kind for those who, like architects and sculptors, aim at no more than a fair general knowledge and an intelligent comprehension of the subject; while the descriptions of machinery and methods are, we suppose, sufficiently practical in character to render the book valuable to quarry owners and marble workers.



HOUSE AT PAULER'S PURY, NORTHANTS. HERBERT NORMAN, ARCHITECT.

This house has just been completed. It is in a fine hunting country, being within a short distance of the Grafton Kennels, and faces the old Watling Street, along which is a continuous stream of motor traffic. Consequently the house has been well set back from the road to avoid the dust nuisance. The brickwork is of small local building bricks, the upper part being roughcast on hollow walls, with brindle coloured tiles on the roof. The adjoining stabling gives accommodation for ten horses. The builder is Mr. A. A. Hawtin of Northampton.

ELECTRICITY IN BUILDINGS.
IV.

By Harold Hastings, M.I.E.E., A.M.Inst.C.E.

(Continued fom page 170, *No.* 708.)

Lamps.

The incandescent lamp is everywhere self-evident, and does not need description. The principle upon which it illuminates is that the current is passed through a filament of carbon which offers considerable resistance. In overcoming this resistance great heat is generated, and the carbon becomes white hot. If air were present, it would immediately burn away, but all the air is removed and the filament is hermetically sealed in a glass bulb so that it cannot be consumed. It is found that it gradually disintegrates and forms a black coating on the interior surface of the bulb as the lamps become aged.

The average life of a good brand of lamp is 1,000 burning hours. Towards the end of its life, the lamp often becomes so black that it is practically useless. This should not occur in a good lamp in less than 800 hours' burning. When ordering lamps it is necessary to mention the voltage of the circuit, the type of cap required (whether screw or bayonet), and the candle-power. The last may be 8, 16, 25, 32, 50, 100, 150, 200, 300, 400, 500, or 600.

There are 5 c.p. lamps, but as they consume practically the same amount of current as an 8 c.p. there is no advantage in having them.

It is always advisable to arrange for a large number of lamps of low candle-power rather than a few concentrated lights of large power. The more the light is distributed the better will be the illumination. Another consideration in favour of a large number of lights and plenty of switches is that much current can be saved by reducing the amount of light when the full brilliancy is not necessary.

When a lamp has become much blackened it is advisable to throw it away. It is still consuming the original amount of current and possibly only giving half the light. It is then a very expensive form of illuminant.

Arc Lamps.

Arc-lamps are made from 500 candle-power up to 5,000. The apparatus consists of mechanism which allows two carbon pencils to touch, and, when current is switched on, to separate a fraction of an inch. The current jumps the gap, as explained in the case of a fuse blowing, and the immense heat generated vaporises the point of the carbons. This vapour, under the action of the current, forms a highly incandescent globe around the extremities of the carbons. As the latter are consumed they are fed together by an automatic arrangement.

This form of light is useful for exterior and workshop illumination. It is very similar to the light of the sun, and can be used for photographic studios, or in shops where it is desired to match colours. Special wiring is required.

Arc lighting is very economical. A 10-ampere lamp will give 1,000 candle-power, and only requires a pressure of 45 volts. Hence it consumes 10×45=450 watts. An 8 c.p. lamp consumes 33 watts, and 14 of them could be lighted with 450 watts. In this way it is evident that 450 watts are equivalent to 8×14=112 incandescent c.p. Hence the relative value in illumination is as 112 is to 1,000, or, in other words, 1 to 9 in favour of the arc lamp. A circuit with 45 volts is seldom available, and the excess pressure has either to be wasted in resistances, or it is necessary to put several lamps in series. Thus, on a 200 volt circuit four lamps would be connected together in series, and only 20 volts wasted in a resistance. They must be all lighted and put out at the same time. There is a device for putting out one lamp only of such a series, but this is done by substituting an equivalent resistance.

Lamps of this type require trimming every 5 to 18 hours, according to their construction. With direct current the carbon on the positive side burns away twice as fast as the other, and is generally made twice as thick. With alternating current both burn at the same rate.

Enclosed Arcs.

Hitherto we have been describing "open" arcs which burn in the air without any protection except from gusts of wind. Another type is made having a glass globe, into which the carbons enter through glands. These are called "enclosed" arc lamps. They differ from the open type in that they work at a pressure of 75 to 90 volts, and take 2½, 5, or 7 amperes.

These lamps give a steady and well-diffused light, and are quite silent in working. They produce a nominal 1,000 candle-power each, with 7 amperes flowing. Thus they compare with the open arc as 560 is to 450, which means that they consume about 25 per cent. more energy. This is more than counterbalanced, however, by the fact that they only require trimming once every 120 to 200 hours. This consideration is of such importance that the real saving in expense is something like 60 per cent. on the open type.

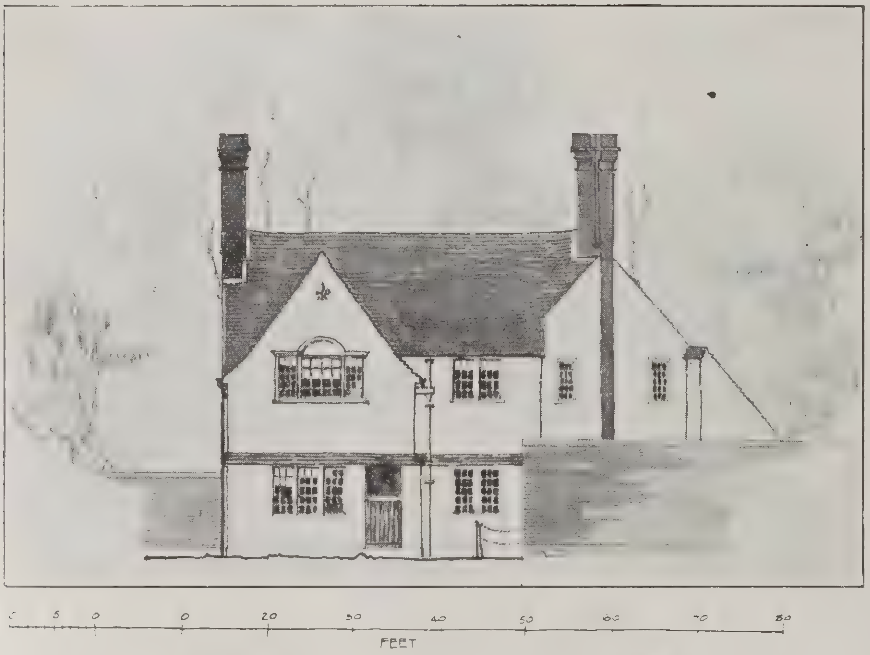
"Flame" Arcs.

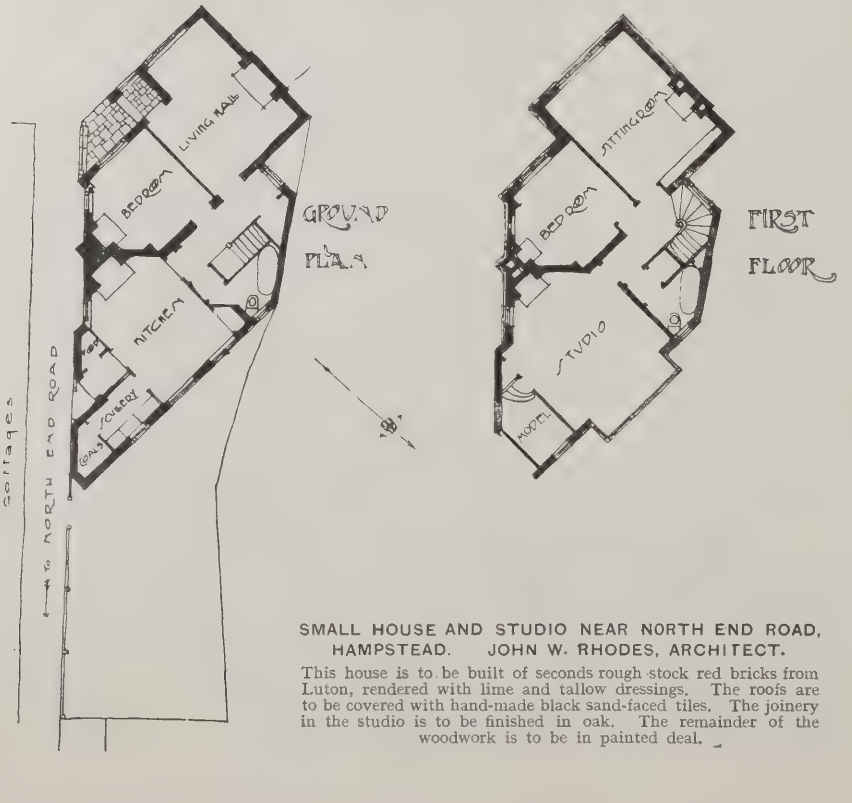
"Flame" arc lamps are a variation of the open arcs. In these the carbons are prepared with an admixture of calcium. They produce a vivid yellow flame in place of the blue-violet of the open arc. Their light is much more pleasant, and more penetrating in fog or mist.

When ordering arc-lamps it is necessary to say which type is required, the length of time they are to burn without retrimming, the pressure of the circuit on which they will be connected, and whether they will burn alone, or in series with others. The method of suspension must be closely looked into, and the means of retrimming considered.

Nernst Lamps,

Nernst lamps have lately come to the fore, and are very suitable for both interior and exterior illumination. The light is particularly soft and pleasant. They seem to be less satisfactory on alternating current than on continuous. They can be obtained for any normal voltage. The cost is greater than that of incandescent lamps, but new filaments can be obtained and are easily fixed. The energy consumed compares as 1 is to 3⅓ with ordinary incandescent lamps. They are, therefore, very economical. The lamps are known by the current they consume. On





SMALL HOUSE AND STUDIO NEAR NORTH END ROAD, HAMPSTEAD. JOHN W. RHODES, ARCHITECT.

This house is to be built of seconds rough stock red bricks from Luton, rendered with lime and tallow dressings. The roofs are to be covered with hand-made black sand-faced tiles. The joinery in the studio is to be finished in oak. The remainder of the woodwork is to be in painted deal.

a 200-volt circuit the following relation is approximately correct:—

A ⅛ ampere lamp gives 20 c.p.
„ ¼ „ „ „ 40 „
„ ½ „ „ „ 80 „
„ one „ „ „ 160 „

The lamps take about a minute to come to incandescence, the intermediate time being taken in heating the filaments by means of resistance coils.

Another new departure in lamps is the "Osmi," in which the filament is made from the rare metal osmium. They are very efficient, consuming 1½ watts per candle. The average life is about 500 burning hours. They cannot be obtained for high voltages, but three or four can be used in series in suitable places.

The Nernst and Osmi lamps, however, and even carbon filament lamps, are subject to the keen competition introduced by

"Osram" and "Tantalum" Lamps.

The filaments of the new lamps are made of rare metals (tungsten and tantalum respectively), and offer an enormous economy in current consumption.

Tantalum lamps are of two kinds—long life with higher consumption, and short life with low consumption. The cost of either class is rather more than double the cost of a carbon filament lamp, but this first cost is soon counterbalanced in the saving in current.

The consumption of a tantalum lamp having an average life of 800 hours is 1.7 watts per candle, whereas one with 1,600 hours' life consumes 2.2 watts per c.p. The variation in the amount of light when the lamp is new and at the end of its life is about 20 per cent.

There is a slight disadvantage by reason of the fact that lamps are not made for use on circuits above 130 volts, so that two or more lamps must be used in series on the most general supply systems in this country.

When ordering, it is necessary to state (1) the working voltage of each lamp; (2) the type of lampholder (bayonet or screw); (3) the shape of bulb (bell or spherical); (4) whether the bulb is to be clear, partly frosted, or wholly frosted; (5) whether the lamps are to work in series and, if so, the series letter: "H" or "L." (These two letters represent the efficiency of the lamps, "H" being high efficiency, namely, 1.7 watts per c.p., and "L" being low, namely, 2.2 watts per candle.)

We have already quoted the average figure of 33 watts per 8 c.p. for carbon filament lamps. This represents 4.1 watts per c.p., and compares very unfavourably with the consumptions given above.

A "Tantalum" Sun Lamp" is also made, giving 45 c.p. at 110 volts. This is a somewhat more expensive lamp, but has a long life. It is generally supplied with a special reflector, increasing the light in the most useful direction to the neighbourhood of 180 c.p.

The candle-power varies with the voltage. It can be seen at a glance from the table below.

Tantalum lamps are not recommended for use on alternating current. The varying direction imposes a greater strain upon the filaments, and the life is considerably decreased.

A broken filament can sometimes be repaired by gently tapping the lamp. The two ends may swing together again, in which case a spark occurs as the current again flows through the completed circuit, and the heat is sufficient to melt the metal at the point of contact and cause the ends to fuse together.

Osram lamps are of more recent introduction. They have all the advantages of Tantalum lamps with the following variations:—They are equally applicable to alternating and continuous currents; the consumption is 1.25 watts per c.p.; the average life is 1,000 hours; the decrease of light during this period is not more than 5 per cent.; the cost per lamp is more; the filament has little cohesion when hot, and must hang in a vertical direction, and not be subjected to vibration.

Osram lamps can be obtained for any voltage up to 130, so that these also are generally used in series. The makers give each lamp a "series number," and all the lamps of any one series must have the same number. The low-voltage lamps are not so fragile as the higher ones, and those up to 25 volts can be used with the same amount of rough handling as with carbon lamps. On alternating current systems a very convenient arrangement is to employ a small transformer for reducing the voltage to 25. At this pressure the lamps are cheaper, and the ordinary wiring can be used without adapting it to groups in series.

A main switch must be placed in a convenient position, controlling the transformer so that it may be switched out of circuit during the hours of daylight. A transformer takes an appreciable amount of current to keep it magnetised, so that much of the economy would be lost if it were kept on continually.

Osram lamps are supplied for 100 to 130 volts, giving 30, 50, or 100 candle-power; and at 25 volts giving 10 and 15 c.p. The order for lamps should state (1) the lamp voltage; (2) the series number; (3) the candle-power; (4) type of lampholder; (5) the shape of the bulb.

Special fittings can be obtained to fix in existing lampholders and carrying two or more "Osram" or "Tantalum" lamps in series. Special adaptor-holders are also supplied in connection with Osram lamps to enable them to hang vertically from lampholders which would otherwise support them at an angle other than the vertical.

Accessories.

Under this heading energy-consuming apparatus other than lamps may be dealt with. Among these

Radiators

take the first place.

Electric heating is never likely to be as cheap as older methods, such as coal or gas fires. The reason is that the whole of the heating element, in the case of electricity, has to be conveyed to the apparatus by means of the wires. With gas this is not so. Heat is produced by means of the union of 1 part of gas with 6 of air, so that only one-seventh of the heating elements have to be conveyed by pipes in the case of gas. The same reasoning applies to coal fires. On the other hand, the whole of the electrical energy brought into the apparatus is given out as heat fulfilling useful purpose, whereas the bulk of it has to be wasted in the other cases, to take the products of combustion up a chimney. Again, when air is used as one of the factors to produce heat, the space from which it is taken has to be refilled with a further quantity. This continual introduction of unheated air takes the form of innumerable draughts, besides giving the coal or gas fire more heating work to do. In spite of these facts it cannot be claimed that electric heating is cheaper, even though the supply companies give very low rates for current for this purpose. When the advantages are taken into account, however, electric heating can more than hold its own in the competition.

The "Glow" Radiator.

The "glow" radiator consists of a number of large incandescent lamps, only partially incandesced, so that a large proportion of heat rays is given out. The lamps are mounted on an ornamental fitting and give out *radiant* heat. The rays of this form of heat pass through the air and heat the objects upon which they strike without affecting the air temperature to any great extent. The immense advantage of this kind of heat will be at once appreciated. Directly the current is switched on, the heat is available, without first heating all the air in the room. Consequently it is not necessary to light the fire until it is actually needed.

The rays are very similar to those of the sun, and their heating effect follows the same lines as the sun's rays. They have been utilised by the medical profession with very beneficial results.

"Air-warmer" Radiator.

"Air-warmer" radiators are of less recent origin than the "glow," and their professed function is to follow the lines of gas and coal fires. They heat the air first in order to convey the heat to the human being, instead of delivering it direct. They are made in the form of screens, and are very ornamental. They have rather a bad habit of "open-circuiting," and the cause of fault is generally difficult to discover. In the glow type a faulty lamp is at once detected and easily replaced.

Radiators should not be placed in existing fireplaces unless the flue has been completely sealed with cement. They are for more useful in the middle of the room. As they cannot vitiate the atmosphere, there is no object in placing them in the fireplace. They should be placed where their rays have the best play.

Radiator lamps are usually made to take 250 watts, so that on a 200-volt circuit 1¼ amperes flow through each lamp. A very good heating rule, which errs on the generous side, is to allow one watt consumption for every cubic foot of space to be heated. Thus a room 10ft. by 10ft. by 10ft. equalling 1,000 cub. ft., will require four lamps. The radiator should be provided with switches to devide the lamps into two sets, as only on the coldest days would all four lamps be required. It is advisable, in large rooms, to supply two radiators of small size, rather than one large one. Those containing four lamps should be the limit in size.

Fans.

Next to radiators, in order of utility, come their exact opposites—fans. These are made in sizes and shapes suitable for any special use. The most common type is the desk fan, which has four blades, about 14ins. in diameter, running at a speed of nearly 2,000 revolutions per minute and consuming 50 or 60 watts. On hot summer days they are greatly in demand.

Another type, which is ousting hand-driven punkahs in India, consists of two or four sweeps. These run at a low speed, are perfectly noiseless, and have a diameter of some 56ins. They consume about 80 watts.

When ordering fans it is necessary to state the size and kind required, the voltage of the circuit, and whether the supply is alternating or continuous current.

If the quantity of air to be extracted from a room, or circulated, is known, it should be mentioned, as the manufacturers can judge the power required.

Other useful accessories are kettles, irons, glue-pots, shaving-pots, plate warmers, soldering irons, and similar articles, all of which can be heated by the application of the electric current.

Electric ovens have advanced the science of cookery into the realms of exactitude. The ovens are portable and compact, and can be used upon the kitchen table. The temperature is under perfect control, and there is no danger of the products of combustion contaminating the food.

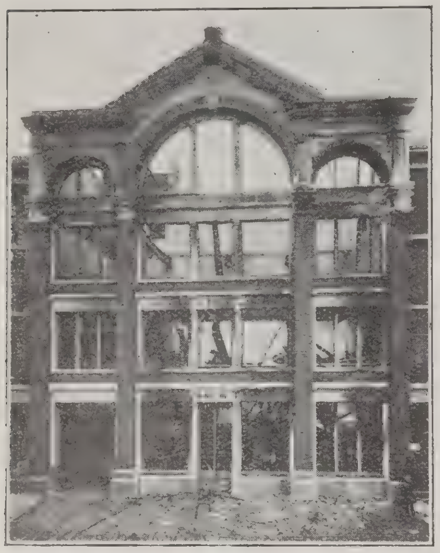
Having now considered in detail most of the materials and apparatus which are likel to be found useful in application to buildings, we are in a position to study the details of their installation.

(*To be continued*).

	Volts.										
	50	55	60	65	75	100	105	110	120	130	Life in Hours.
"H" type = 1.7 watts per c.p. ..	11	12	13	14	15½	21	22	23	24½	27	800
"L" type = 2.2 watts p.r c.p. ..	6½	7	8	8½	9½	13	14	14½	—	—	1600
"Sun"	—	—	—	27	31	41	43	45	49	53	1800

THE FIRE AT MESSRS. W. N. FROY'S.

Last week brief reference was made to the destructive fire at Messrs. W. N. Froy and Sons, Ltd., Brunswick Works, Hammersmith.



FRONT OF MESSRS. W. N. FROY & SONS' PREMISES AFTER THE FIRE.

The fire at these premises in King Street, Hammersmith, was one of the fiercest blazes seen in this part of London. The facade here shown is practically a tottering shell and has had to be shored up preparatory to being demolished. Traffic in King Street had to be diverted for two or three days, this occasioning much inconvenience.

We now present two photographic views that will serve to indicate the extent of the damage. About five o'clock on Friday morning, June 4th, a man passing by caught sight of smoke issuing through the front entrance. He immediately rang the alarm bell, at the same time rousing the caretaker, who made his way through the dense clouds of smoke, which seemed to be coming from the main centre building, to the private office of Mr. H. P. Froy, the managing director. He soon realised that the whole of the central building was in flames. The fire raged over a space of 250ft. by 80ft., this being, however, only the central and main front of Messrs. Froy's premises, which contained a great deal of inflammable material such as oils, paints, colours, brushes, and electric fittings. Then the paper showroom caught fire, and about four or five hundred thousand rolls of wall paper were destroyed. Fortunately, owing to the direction of the wind, the second and third warehouses, which extend over premises as large again as those burnt, were untouched. The fire having been at length got under, Mr. H. P. Froy speedily got the business into working order, and it was soon proceeding as if nothing had happened. The new showrooms remain intact. Messrs. Froy hope to commence rebuilding immediately the front and central premises, and will take the opportunity of enlarging them to meet the requirements of their expanding business as builders' merchants, etc.

Mr. E. F. Cobb, architect, has moved his office from No. 20, to No. 43, High Street, Rochester (first floor).

* * *

"Holidays Abroad," an illustrated booklet of a series of tours in the less-known districts of Holland, North Germany, the side valleys of the Rhine, the Belgian Ardennes, and the Tyrol, easily and inexpensively reached by the Great Eastern Railway Company's Harwich route to the Continent, has been issued from 30, Fleet Street. The illustrations are numerous, and there are several very handy route-maps. The booklet should certainly be seen by architects and others who contemplate spending their summer holidays abroad.

Federation News.

Northern Centre Board of Conciliation to the Building Trades.

The annual meeting of the Northern Centre Conciliation Board was held at the Grand Central Hotel, Briggate, Leeds, on Tuesday afternoon, May 18th, when Mr. T. Wilkinson, Middlesbrough, presided over a fully represented meeting.

Mr. Thomas Wilkinson, Middlesbrough, was re-elected chairman of the Board for the ensuing year, and Mr. David Richards, J.P., was re-elected to the vice-chair.

Messrs. James Denver (Manchester), and Councillor Alfred Gould (Hull) were re-appointed joint secretaries for the respective parties.

The minutes of the last annual meeting and of six special meetings held during the year, were taken as read, and were confirmed.

Several amendments to the Conciliation Board rules sent up by the Employers' Northern Centre Executive were considered.

The proposal to amend rule 2 was carried by 13 votes to 9.

The proposal to amend rule 13 to provide that at least two cross votes shall be required to carry a decision was considered at considerable length, but it was eventually agreed to withdraw the same.

The proposed new rule to provide for the fixing up of minimum periods for which decisions given by the various Boards shall endure was considered; but on being put to the vote was defeated by 18 votes to four.

The suggested new rule of procedure, allowing either side to retire for private consultation on any question, was unanimously agreed to.

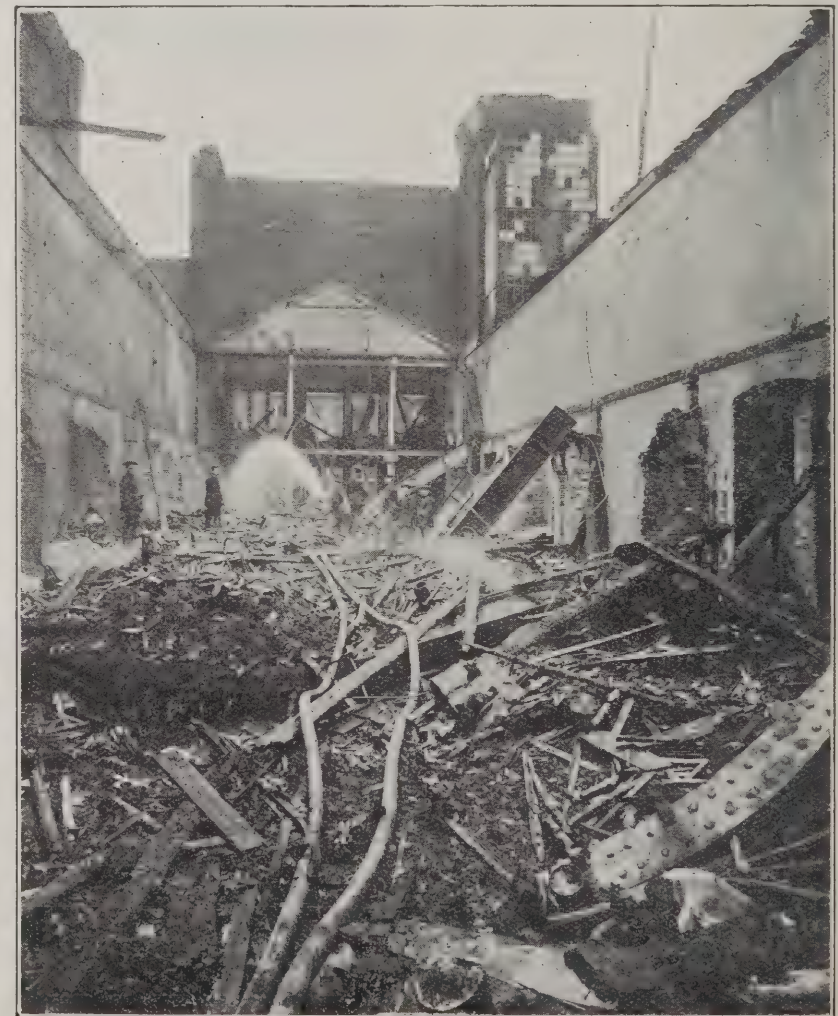
Some discussion took place on the question of other trades and the labourers being invited to join the scheme as per resolution passed at the annual meeting of this Board in May, 1907, and the employers' secretary reported the result of the endeavours of the National Federation thereon.

A rather lengthy discussion took place regarding the admittance of the builders' labourers, and the employers were requested to re-consider the same at an early date.

An appeal from the Liverpool local board was then heard in reference to a notice given by the employers of bricklayers for a reduction in wages of ¾d. per hour, alterations in the present working rules, and various amendments to rules; also a counter-notice from the operatives for an advance of 1¼d. per hour and various amendments to rules, and representatives were admitted to state their case.

After the witnesses had retired, a resolution was moved whereby the operatives would receive an advance in wages of ¼d. per hour and reduced working hours similar to those at present in operation with the joiners and masons of that town. Two amendments were moved, and, on being put to the ballot, each received equal votes. Ultimately the original proposition was put to the vote, and carried by two cross-votes.

The joint secretaries reported having received an appeal from the Manchester Local Board on a stonemasons' dispute, and it was agreed that the same be heard after Whitsuntide, the date of meeting to be left to the secretaries. — JAMES DENVER, Employers' Secretary, Cromwell Buildings, Blackfriars Street, Manchester.



INTERIOR OF THE GUTTED BUILDING AT MESSRS. W. N. FROY AND SONS' PREMISES.

The interior of this building after the fire is a striking illustration of the necessity for fire-resisting construction. The fate of the steel girders and stanchions can plainly be seen. In this building, Messrs Froy & Son', who are builders' merchants, warehoused about half-a-million rolls of wall paper.

SPECIALITY:
"ETERNIT" Terra-cotta Tiles, which neither break nor crumble, and at half the cost of Staffordshire Tiles, double the strength and about one-third of the weight.
Prompt delivery.
Speedy fixing.
No breakages.

G. R. SPEAKER & Co.,
ENGINEERS,

29,
Mincing Lane,
E.C.

For enduring roofing material and workmanship,

Architects, Engineers & Surveyors

are respectfully recommended to specify

ETERNIT REGISTERED TRADE MARK 1904,

Guaranteed and manufactured under Hatschek's Original Specification and to decline all substitutes. No other roofing tile is "ETERNIT." (Regd.)

WRITE FOR SAMPLES AND FOR TENDERS FOR FIXING.

Smooth on both sides. Roofs covered with "Eternit" Tiles weigh about 22 lbs. per square yard, or 66⅔ lbs. lighter weight per square laid than Bangor Slates. Greater mechanical and tensile strength. Non-Conducting. Non-Combustible. Impervious to sun, heat, frost and rain. Wind, dust and weather tight.

G. R. SPEAKER & Co.,
CONTRACTORS,

28,
MARK LANE,
LONDON, E.C.

GUARANTEED:
Tensile strength, 5781 lbs.
Crushing force 8,281 lbs.
Per Square Inch and always increasing with age.
Immunity from repairs.

Architects, Engineers and Surveyors are earnestly warned not to confound "Eternit" Tiles with so-called Asbestos Slates varying in quality, thickness and colour, advertised under fancy brands. "Eternit" "endures not for an age, but for all time."

THE HATHERN STATION BRICK & TERRA COTTA COMPANY, Ltd.,

Supplied the Terra Cotta for this Building.

WORKS & OFFICES:
Hathern Station,
Loughborough.

Blue Brick Makers

CLIFF WORKS,
TAMWORTH,
STAFFORDSHIRE.

(See our fortnightly picture of building.)

Co-operative Insurance Co.'s. Offices, Manchester.

Publisher's Notices.

Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.

Telegraphic Address : "Buildable, London."

Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

Date of Publication:—The BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER is published every Wednesday, price 2d.

A Special Section is regularly presented free with the ordinary issue, three weeks out of every four. These three regular monthly supplements are entitled "Contractors' and Federation Section," "Concrete and Steel Section," and "Fire-resisting Construction Section" respectively.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion - 1s. 6d.
Each additional line - - - - 6d.
Three insertions* - - - - 3s. 0d.

* This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open, Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER, S.W

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Aberdaron (Carnarvonshire).—For completion of eight cottages. Mr. H. Clapham Lander, A.R.I.B.A., architect, Effingham House, 1, Arundel Street, Strand, W.C.:—

J. Griffith	£2,840	0	0
W. and R. Jones	2,258	0	0
J. T. Jones, Abererch, N.Wales	2,218	16	0

Abergavenny.—For new north aisle, vestry, etc., at Holy Trinity Church. Mr. E. A. Johnson, F.R.I.B.A., architect, Abergavenny:—

T. Broad, Ltd.	£1,299
R. W. Moon	1,295
H. Smith	1,180
J. G. Thomas and Sons,* Abergavenny	1,175

*Accepted.

Bargoed (Wales). — For erection of a chapel schoolroom at Bargoed, for the English Wesleyan Church. Mr. W. Harris, architect and surveyor, Bank Chambers, Bargoed:—

W. Williams, Cardiff	£1,544	0	0
F. D. Watkins, Bargoed ...	1,518	0	0
E. D. W. Evans, Cardiff ...	1,357	0	0
A. S. Morgan and Co., Newport	1,330	0	0
J. Brown,* Bargoed	1,290	0	0
Kirby and Westacott, Newport	1,250	0	0
H. J. Davis, Bargoed	1,237	15	0

*Accepted.

Belper.—For erection of two children's homes on land at Holbrook Road, Belper, for the Guardians. Messrs. Hunter and Woodhouse, architects, Bridge Street, Belper:—

J. Dickinson, Derby	£1,325	0	0
Wheeldon Bros., Belper... ...	1,240	0	0
Evans Bros., Greenhill-lane ...	1,235	0	0
Harris and Hunt, Marehay ...	1,175	5	8
J. W. Haynes,* Strutt Street, Belper	1,152	6	8
E. Morley and Son, Derby ...	1,148	3	0

*Accepted.

Brynmawr.—For pulling down old buildings and erecting a small post-office and telephone exchange. Mr. W. H. Dashwood Caple, F.R.I.B.A., architect, 2, Church Street, Cardiff:—

J. Williams	£788	5	6
Thomas and Sons	770	0	0
Ebbw Vale Building Co.	713	1	2
J. Jenkins,* Brynmawr	597	0	0

*Accepted.

Caerau (near Maesteg).—For erecting a church, for the Rev. J. Jones and Committee. Mr. G. E. Halliday, F.R.I.B.A., architect, 19, Castle Street, Cardiff:—

W. H. Evans	£4,468	17	7
D. W. Evans	4,395	3	0
Evans and Jones	4,290	13	8
Prothero	4,279	10	0
L. Rees	4,279	0	0
W. Symonds and Sons	4,050	0	0
Stevens, Bastow, and Co. ...	3,994	0	0
Cox and Bardo	3,975	16	5
W. and J. R. Watson,* Edinburgh	3,876	0	0

*Accepted.

Dearham (Cumberland).—For erection of three dwelling-houses, for Messrs. Thomas and Roe. Mr. W. Serginson, architect, Allonby, Maryport. Quantities by architect. Accepted tenders:—

W. Marshall, 8, Station Street, building, etc.	£310	0	0
J. Mulcaster, Crossby, joiner ...	148	19	3
J. C. Perrin, Retson Street, Workington, plastering	82	0	0
M. Clark, Netherton, slater ...	45	0	0
T. Maudle and Co., South Quay, plumbing	14	0	0
R. F. Brocklebank, Grasslet, painting	10	7	6

*Accepted.

Eastbourne. — For four houses and shops in Church Street, Eastbourne. Mr. C. Crisford, architect, 49, Gildredge Road, Eastbourne:—

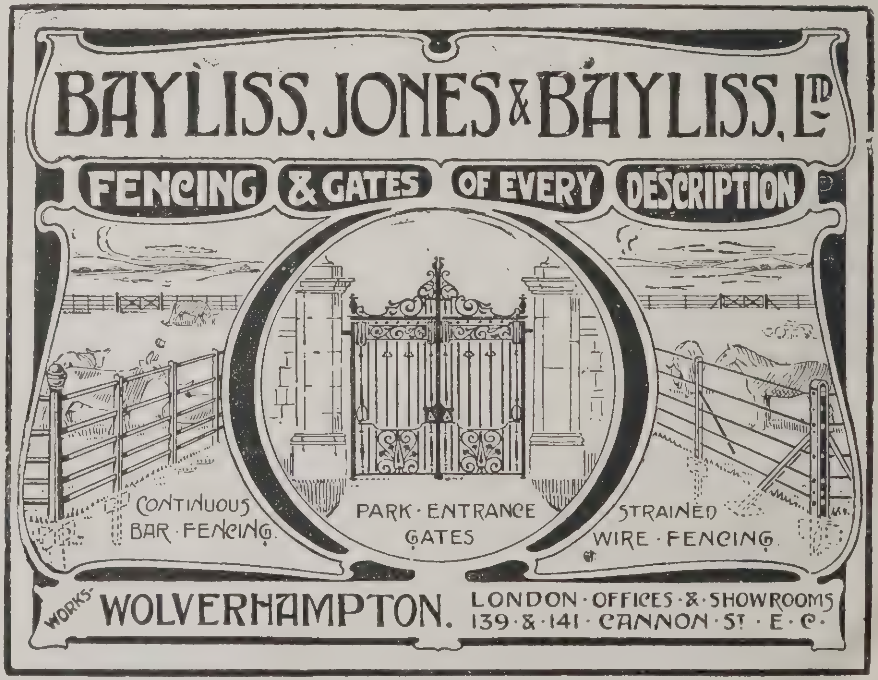
N. Martin and Sons	£2,100	0	0
J. Bodle	1,917	0	0
T. Dunlop	1,900	0	0
Miller and Selmes	1,868	0	0
Bainbridge and Son	1,780	0	0
J. Martin	1,690	0	0
Sawyer and Son	1,650	0	0
F. Rich	1,388	0	0
E. Relf*	1,209	10	0

*Accepted.

(*Tenders continued on page viii.*)

ROOFING SLATES.
Velinheli, Penrhyn and Westmoreland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

"AQUABAR"
WATERPROOFING COMPOUND
For Cement and Concrete.
Easiest to use, most economical, reliable and satisfactory.
C. S. TAPLIN & Co.,
MOORGATE STATION CHAMBERS,
LONDON, E.C.


BAYLISS, JONES & BAYLISS, LTD
FENCING & GATES OF EVERY DESCRIPTION
CONTINUOUS BAR FENCING
PARK ENTRANCE GATES
STRAINED WIRE FENCING
WORKS- WOLVERHAMPTON.
LONDON OFFICES & SHOWROOMS 139 & 141 CANNON ST E.C.

FOLDING PARTITIONS.
REVOLVING SHUTTERS.
Hartley Bros.
2/- ft. Super.
1/- ft. Super.
GORTON, MANCHESTER.

J. G. HAMMOND & CO., LTD.
PRINTING CONTRACTORS.
LONDON WORKS: 32 to 36, Fleet Lane, Ludgate Circus, E.C.
MIDLAND WORKS: Scotland Passage, High Street, and Moor Street, Birmingham.

SPECIALITY:
CATALOGUES of all kinds,
PUBLICATIONS of all kinds,
BOOKS of all kinds.

LARGE INSTALLATION OF LINOTYPE AND MONOTYPE COMPOSING MACHINERY. ENGLISH, AMERICAN AND FAST ROTARY PRINTING AND FOLDING MACHINERY.

☞ IMITATION TYPEWRITTEN CIRCULARS supplied with names and addresses typed in separately to match the body or alternatively so printed as to enable you to type in the names and addresses on your own typewriter.

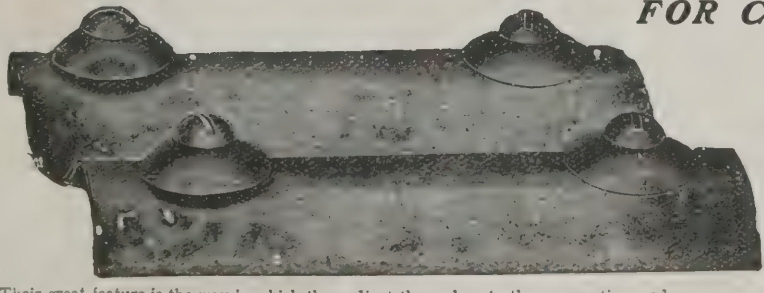
SEND FOR ESTIMATES AND UNIQUE TESTIMONIALS.

HOSPITALS, INFIRMARIES, SCHOOLS, &c., REQUIRE
MANCHESTER STOVES, GRATES, & VENTILATORS.
E. H. SHORLAND & BRO., DRAKE STREET WORKS, MANCHESTER.

LIGHTNING CONDUCTORS
Supplied, Erected and Tested. Chimney Shafts Restored, &c.
J. LEWIS, 5 & 6, Great Winchester Street, LONDON, E.C.
TELEPHONE No. 3053 CENTRAL.

BUTTERS BROS., **CRANES for CONTRACTORS**
WATERLOO STREET, GLASGOW.

"LIMPET" PATENT BOLTS & WASHERS
FOR CORRUGATED IRON SHEETS.



"There is no doubt in our mind that they ought to be regularly specified where [illegible] iron sheeting is used."—*Vide* BUILDERS' JOURNAL.

PRICE'S PATENT

The latest and most approved Fixing for joining Corrugated Iron Sheeting together.

REGISTERED TRADE MARK
LIMPET

Their great feature is the way in which they adjust themselves to the corrugation and make an **absolutely watertight joint.** They also retard the corrosive action in Galvanized Sheets and combine other advantages.

EXCLUSIVELY ADOPTED BY THE INDIAN GOVERNMENT, THE LEADING RAILWAYS AND MANY OF THE LARGEST MANUFACTURING CONCERNS IN ENGLAND AND THE COLONIES.

Full particulars and samples from the Managing Agents
WILLIAM JACKS & CO., 5, East India Avenue, LONDON, E.C.
Agents for Scotland: Frank G. Price & Co. 53, Waterloo St., Glasgow.

(*Tenders continued from page vi.*)

Dudley Port, Tipton.—For alterations and extensions to the Royal Oak Hotel, Dudley Port, Tipton, for Messrs. Holders Brewery, Ltd. Quantities by the architect, Mr. Geo. H. Wenyon, Dudley.

Lindsey Jones, Wolverhampton	£2,820
Surman and Son, Birmingham	2,615
T. Hardy, West Bromwich	2,532
C. Griffiths, Stourbridge	2,476
H. Dorse, Cradley Heath	2,470
C. A. Horton, Brierley Hill	2,452
Oakley and Coulson, Dudley	2,445
Hy. Gough and Son, Wolverhampton	2,350
Jno. Dallow and Sons, Birmingham	2,330
Hy. Smith and Son, West Bromwich	2,269
R. Speake and Sons, Wolverhampton	2,199
W. J. Whittall and Son,* Birmingham	2,095

*Accepted.

Gellidowel (Glamorgan).—Accepted for erection of Gellidowel Council school, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., county architect, Cardiff.

F. Bond, Cardiff, £6,949 10s. 3d.

Ipswich.—For alterations and additions and new latrines at St. John's Home, for the Guardians. Mr. J. A. Scheurmann, architect, Northgate Street, Ipswich:—

W. Grayston	£1,193	0	0
C. Roper	1,111	0	0
Sadler and Sons	1,110	0	0
F. Bennett	1,080	0	0
W. H. Death	1,075	0	0
W. G. Fisk and Co.	1,069	10	0
P. J. Turner	1,067	0	0
Spencer, Santo and Co., Ltd.	1,060	0	0
A. J. Linzell	1,053	0	0
Cubitt and Gotts	1,052	0	0
G. Grimwood and Sons	1,047	0	0
G. A. Kenney	1,040	0	0
S. A. Kenney	1,035	0	0
C. A. Cundall	998	10	0
C. A. Green	993	0	0
A. Gayford	965	10	0
V. A. Marriott,* London Road, Ipswich	938	10	0

*Accepted.

London, N. — For rebuilding the Tottenham Grammar School, for the Foundation Governors. Mr. H. G. Crothall, architect:—

F. G. Minter	£12,320
Leslie and Co.	12,191
Holloway Bros.	12,099
J. Stewart	12,021
W. Johnson and Co., Ltd.	11,985
Ford and Walton, Ltd.	11,924
E. Lawrance and Son	11,817
Fitch and Cox	11,788
W. Lawrence and Son	11,694
Rowley Bros.	11,027
W. J. Renshaw	11,393
Mattock Bros.	11,077
A. Fairhead and Son	11,067
Treasure and Son, Ltd.	10,909
G. Neal	10,698
A. Porter	10,482
H. Knight and Son	10,437
Brand, Pettitt and Co.*	10,327

*Recommended for acceptance.

Merthyr.—For proposed new Y.M.C.A. buildings, Merthyr. Messrs. I. Jones and P. Thomas, architects, 18, St. Mary Street, Cardiff.

Terra Cotta.

W. Brown	£7,548
Williams and Sons	7,314
Jones Bros.	7,040
E. R. Evans and Bros.	7,025
Knox and Wells	6,950
D. Davies and Son	6,906
W. Thomas	6,896
J. Jenkins	6,857
N. Moss	6,813
Stephens and Bastow	6,444
W. Symonds and Son	6,402
W. Williams	6,199
A. J. Colborne	5,871
D. W. Davies and Howell*	5,688

Bathstone.

W. Brown	£8,332
Williams and Sons	7,314
Jones Bros.	7,040
E. R. Evans and Bros.	6,872
Knox and Wells	6,770
D. Davies and Son	6,750
W. Thomas	6,721
J. Jenkins	6,717
N. Moss	6,988
Stephens and Bastow	6,235
W. Symonds and Son	6,227
W. Williams	6,099
A. J. Colborne	5,780
D. W. Davies and Howell	5,580

Club Room.

N. Moss	£144
W. Brown	118
Jones Bros.	105
D. Davies and Son	100
E. R. Evans and Bros.	95
J. Jenkins	92
Knox and Wells	90
Williams and Sons	90
W. Symonds and Son	88
D. W. Davies and Howell	81
A. J. Colborne	77
Stephens and Bastow	87
W. Thomas	87
W. Williams	75

*Accepted.

Newby (Settle).—For new school at Newby, for the Settle District Education Sub-Committee.

Tenders recommended for acceptance.

Newsome and Winder, Ingleton, builder	£260	0	0
H. Wildman, Morecambe, joiner	147	0	0
J. Atkinson and Son, Ltd., Leeds, slater	32	13	0
W. H. Greenep, Bentham, plumber	73	0	0
C. M. Slinger, Clapham, plasterer	21	18	0
W. H. Greenep, Bentham, painter	19	17	0

Pencoed (Glamorgan).—Accepted for additions to Pencoed Council school, for the Glamorgan Education Committee. Mr. D. Pugh-Jones, F.S.I., county architect, Cardiff.

W. Williams, Cardiff, £1,600.

St. Abb's (Berwickshire).—For the construction of a lifeboat slipway and storehouse at St. Abb's, in the parish of Coldingham, in the county of Berwick, N.B., for the Committee of the Royal National Lifeboat Institution. Mr. W. T. Douglass, M.I.C.E., engineer and architect, 15, Victoria Street, Westminster:—

W. Pearce, St. Abb's	£1,968	9	10
R. Collin, Eyemouth	1,465	7	8
E. R. Lester, Plymouth	1,400	0	0
D. Rae, Edinburgh	1,303	8	0
Handman and Co., Finchley	1,289	7	7
R. C. Brebner and Co., Edinburgh	1,238	0	0
Exors. of J. Arundel,* Bradford	1,184	0	0

*Accepted.

Stratford, E.—For the erection of offices and extension to laundry, Romford Road, Stratford, E., for Tillett's "Essex" Sanitary Steam Laundry, Ltd. Mr. Miles W. Hudson, architect, 8, Harpenden Road, Wanstead, N.E.:—

Frank Hamlett, Plaistow	£1,895	0	0
Charles R. Price, Bishopsgate Street	1,595	0	0
G. J. Hosking, Forest Gate	1,575	0	0
G. Parker and Sons, Peckham	1,487	0	0
A. G. Barton, Walthamstow	1,479	0	0
William Nash, Deptford	1,449	0	0
A. E. Symes, Stratford	1,423	0	0
Clemens Bros., East Ham	1,320	10	0
W. Richardson, Stratford	1,300	0	0
F. and A. Willmott, Ilford	1,259	0	0
F. J. Coxhead,* Leytonstone	1,257	0	0

*Accepted.

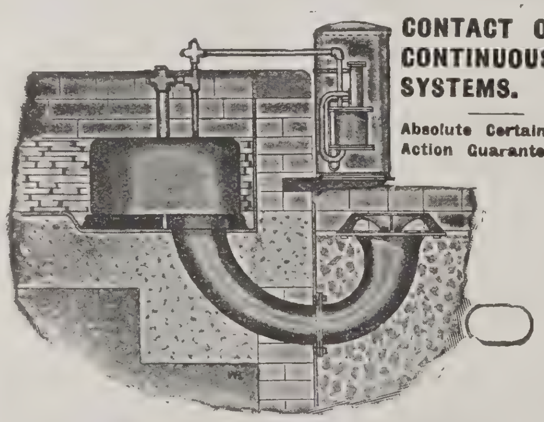
Sutton-in-Ashfield.—Accepted for erection of new Council school at Sutton-in-Ashfield.

T. Fish and Son, Nottingham, £5,738 12s.

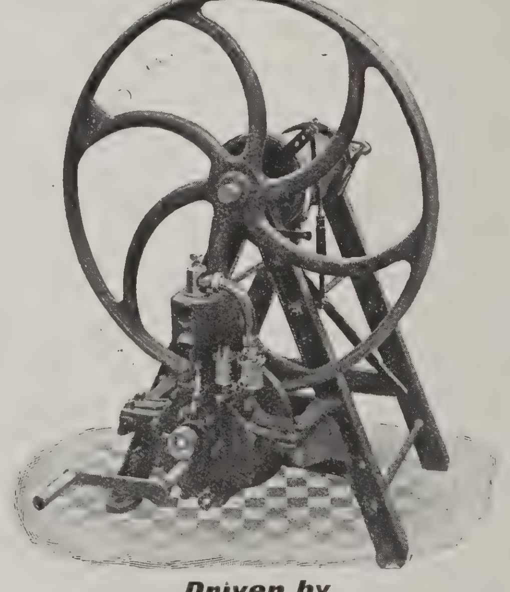
BACTERIAL TREATMENT
OF SEWAGE.

CONTACT OR CONTINUOUS SYSTEMS.
Absolute Certainty. Action Guaranteed.

PATENT ALTERNATING SYPHONS.
PATENT TIMING SYPHONS
(requiring no auxiliary brick chambers).
PATENT ROTARY DISTRIBUTORS
FOR TRICKLING FILTERS.
PATENT SEWER FLUSHING SYPHONS.
BURN BROTHERS,
Sanitary Engineers,
3, Blackfriars Rd., LONDON, S.E.
ALSO AT EDINBURGH.



BROOM & WADE,
ENGINEERS, LTD.,
HIGH WYCOMBE.
POWER HOISTS for BUILDERS.
Always Ready for Use.
No Skilled Attention Required.
Driven by
PARAFFIN, PETROL or ELECTRIC MOTORS
2 cwt., 4 cwt. and 6 cwt. loads.
27, CLEMENT'S LANE, E.C.
Telegrams: "Inbrake, London." Telephone: 15133 Central.



LANCASHIRE, CHESHIRE AND NORTH WALES FEDERATION.

A special meeting of the Administrative Committee of the Lancashire, Cheshire, and North Wales Federation was held at the Board-room, Manchester, to receive counsel's report in the case of a Bolton member, and a special sub committee was appointed to deal with the same.

Correspondence was read between the secretary and the joint secretaries of the National Conciliation Board regarding the Rochdale Employers' Association refusing to carry out the Conciliation Scheme, and a deputation was appointed to visit Rochdale with a view to inducing them to adhere to the rules. This deputation have since visited the town, and it is pleasing to note that the employers there have now agreed to submit their case to the Board, and it is understood that a meeting is to be called for that purpose at an early date.

A case of a certain firm refusing to conform to a decision given against them by a local Conciliation Board was reported, and it was decided to deal with them under the rules.

The monthly meeting of the Administrative Committee was held in Manchester on Friday, May 14th, when Mr. William Bullen presided.

An application for membership from the Accrington Building Trades Employers' Association was before the meeting, and the new society were recommended to the Executive Board for admission.

Matters referring to the financial affairs of the Federation, organisation, treasurership, etc., were before the meeting, and resolutions adopted thereon.

In consequence of the importance of the business to be transacted at the annual general meeting, it was decided to alter the place of meeting from New Brighton to Manchester.

Several meetings of the Insurance Committee have been held during May, and their proposed amended agreement has now been submitted to the Insurance Association for approval or otherwise.

The quarterly meeting of the Master Plasterers' Trade Committee was held at the Temperance Institute, London Street, Southport, on Thursday, May 27th, when Mr. William Cooke, jun., occupied the chair.

Matters of branch trade interest were the chief business under discussion. Mr. J. B. Johnson, Liverpool, read a very interesting and instructive paper dealing with the N.A.O.P. Agreement and its amendments.

Owing to pressure of business, time did not permit of the consideration of the sub-contract form which Mr. Johnson had intended introducing into his paper, and it was ultimately agreed to call a special meeting of the committee in Manchester at an early date, to give the same full consideration.—John Tomlison, Secretary.

SHEFFIELD ASSOCIATION.

Secretary: Thos. Smith.

A further meeting of the Trades Committees was held at the Builders' Exchange on June 2nd.

The meeting was opened by the reading of a letter dated March 6th embodying the views of the M.B.A. in support of the proposed abolition of walking time, to which a reply (also read) had been received from the operatives dated May 25th, saying that the matter had been considered by the operatives of the societies concerned, who were of opinion that some concession should be made in lieu of walking time, and they requested that the wages of bricklayers and carpenters and joiners be increased ½d. per hour, and that lodging money be paid on all jobs distant over 4 miles from Sheffield Parish Church at the rate of 6d. per night or 3s. per week. The bricklayers also requested that one hour's notice should be given on leaving. It had often occurred that on getting to the pay table bricklayers had been discharged absolutely without notice, and had had to return to the job at considerable inconvenience to fetch their tools.

The Chairman said that very few men were paid walking time at the present time, and as the rule was so consistently ignored, and was productive of so much inconvenience where it was carried out, they had, after very careful consideration, come to the conclusion that it should be abolished, and if abolished it would inflict a hardship on no one, but would undoubtedly be to the best interests of both operatives and employers. Proprietors had a very great objection to men appearing on a small job 15 or 20 minutes after the officially recognised starting time, and at once began to reckon up how much time they were paying for for which no work was done. Outside employers who came into the town did not recognise these rules in regard to walking time, and the local contractor was therefore put at a considerable disadvantage. The outside contractor who was not a member of any association put down his plant on a job outside Sheffield and engaged men on the job, while if a member of the M.B.A. had the same job, he would be called on to pay walking time. In these times it was imperative that they be in as good a position as anyone else, and they asked the operatives to assist them. The counter demand which the operatives had set up, which would mean an increase in wages of say 2s. per week, would leave them no better off, and would absolutely defeat the object for which they set out. A study of prevailing conditions would show that the present tendency was to decrease rather than increase wages, and he might say that the association considered the demand as most extravagant, and one which, under no circumstances, could they give any consideration to, anxious as they were at all times to create a good feeling between employers and employees. The abolition of walking time did not decrease wages or reduce the earning capacity of operatives in the slightest: it simply meant that in some cases they would commence work in some cases 10 or 15 minutes earlier.

Mr. Lane asked if the employers had any suggestion to make in lieu of walking time, to which

The chairman replied in the negative, and in reply to Mr. Wood, he further said that the M.B.A. could not for one moment consider the question of raising wages.

Mr. Biggin said that so far as cheapening building operations in Sheffield was concerned, the proposed abolition would not affect it one iota. It was on the outside jobs where walking time was demanded where they were crippled, and he proceeded to refer to a job where Sheffield workmen worked for an outside contractor for 8d. per hour, while the same workmen would have been paid 9½d. per hour and would have in addition demanded walking time from a Sheffield contractor. The local contractor had not therefore the proverbial dog's chance. When men were sent from the contractor's place of business to work outside a 4 miles' limit, they were paid railway fares and lodging money without question, and they were anxious to continue that arrangement. He therefore proposed: "That lodging money be paid to men sent from the contractor's place of business to work on jobs over 4 miles from the Sheffield Parish Church: no lodging money to be paid men set on on the job."

Mr. Wilkinson said that in his 25 years' experience they had paid walking time, railway fares and lodging money to men sent from the shop, but on some outside jobs his firm had done, if they were to pay the same to men set on on the job, they would never get a job. He proceeded to quote another job where the difference if walking time had been paid would have averaged £7 10s. per week to them. He had never understood that walking time was paid to men other than those sent from the shop, but he might say that on a recent job outside Sheffield they paid their men 9½d. per hour, while men working on another job only 200 yards away were receiving 8d.

Mr. Evans said he would like Mr. Biggin's motion better if he would leave out the clause about men set on on the job.

Mr. Biggin, in reply, said that the matter would regulate itself in a period of good trade, because a man would not walk 4 miles if he could get a job within the city.

Mr. Stone held that it was unfair that if a contractor advertised for men outside the district and received applications from Sheffield men, that he should deprive them of the lodging money. He also objected to reference being constantly made to Corporation jobs, and held that they had brought several others before the Board. He also thought that Sheffield employers had paid 8½d. per hour.

Mr. Biggin said they did not want men to work for 8½d. They were contending for the Sheffield rate of 9½d., and it was better that men should be employed at this rate than accept 8½d. from an outside employer.

The Chairman remarked that it would be better to speak of generalities than to "spot" individuals. The fact was, however, that this question of walking time had been brought into special prominence on Corporation jobs. What they were contending for was that the Sheffield contractor should have any legitimate benefit there was which would be conceded to an outsider.

In reply to several queries, the Chairman said that in a job over 4 miles from the Sheffield Parish Church the fare out and return fare every fortnight would be allowed.

Mr. Stone suggested that Mr. Biggin's motion should be altered to read, "all men resident in Sheffield," but

Mr. Biggin could not accept the suggestion, and

The Chairman said they were prepared to pay expenses to all men they sent to the job, but in regard to men engaged on the job they thought they ought to have the advantage.

Mr. Wilkinson presumed a case in which 50 men were engaged on a job for 12 months and received lodging money. That would add £355 to his tender, and that was a very great consideration now when many tenders came within £10 or £20 of each other.

The discussion next turned on the average wages of a bricklayer, and the 2s. or so per week he might have to pay for tram or railway fares.

Mr. Wood asked if it was proposed to pay lodging money to men whether they elected to lodge or come home, and

The Chairman, in reply, said that lodging money would in his opinion be paid to such men as were sent from the shop whether they elected to come home or not. In summing up the discussion, he further remarked that the views of the operatives would be put before the M.B.A. at their next meeting. They were most anxious to settle the matter amicably, and to have a rule which was not complicated. The alteration would not affect 10 per cent. of the work, and was not such a "back-breaking" job as he was afraid Mr. Stone and others had attempted to make out. He could assure them that the matter would receive very careful consideration, and the result would be communicated to their secretary as early as possible.

With reference to the question of giving one hour's notice to bricklayers, the chairman said the matter had not been considered, but he did not think there would be any objection to it, provided that if they agreed, the hour must be worked.

On May 27th a committee of eight was appointed to arrange for the reception of the Belgian builders who will visit Sheffield on August 10th and 11th, and it was decided to form a guarantee fund. The amount guaranteed at the meeting was £31 10s., which has since been increased by further subscriptions to £45 15s. 6d. It is intended to give the visitors a right royal Yorkshire welcome.

After June 24th, the address of the Royal Sanitary Institute and Parkes Museum will be No. 90, Buckingham Palace Road, London, S.W.

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about **five days** after the date of this issue.

Unless expressly stated to the contrary, all deposits required for bills of quantities, etc., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

June 14-29. **WALTHAMSTOW.**—Erection of a junior mixed school, to be erected on the playgrounds of the Coppermill Road school, for the Education Committee. Names to the architect, H. Prosser, M.S.A. Applications for bills of quantities must be sent to the architect, accompanied by deposit of £5. Tenders to be sent to T. W. Liddiard, Secretary to the Committee, High Street, Walthamstow.

June 21. **HAXEY.**—Erection of a new church and out offices at Haxley. Plan, etc., of the Rev. P. H. Powell, Epworth.

June 21. **PENSHAW STAITHES.**—Erection of a miners' hall at Penshaw Staithes. Plans and specifications of the Architect, Jas. Palliser, Philadelphia, Fence Houses, to whom tenders are to be sent.

June 21. **MIDDLESBROUGH.**—Alterations to Public Fish Market, for the Corporation. Specification, etc., and form of tender, of S. E. Burgess, M.Inst.C.E., Borough Engineer, Middlesbrough, to whom tenders are to be sent.

June 21—July 1. **LONDON.**—Repairs and decorative work at the Infirmary, Lower Road, Rotherhithe, S.E., for the Guardians. Forms of tender, specification, etc., on deposit of £10 Bank of England note with E. Pitts Fenton, Clerk, 283, Tooley Street, S.E.

June 21. **CARDIGAN.**—Erection of a platform, seating accommodation, etc., for the Eisteddfod Pavilion, for the committee of the Cardigan Semi-National Eisteddfod. Plans and specifications may be seen with D. Williams, Secretary, Yngs, Cardigan, to whom tenders must be sent.

June 21. **SOUTHAMPTON.**—Constructing a Police Station, etc., at Payne's Road, for the Corporation. Plans, specification, and conditions may be inspected and form of tender obtained at the Borough Engineer's office upon production of the Borough Treasurer's receipt for deposit of £2 2s. Tenders to be sent to R. R. Linthorne, Town Clerk, Municipal Offices, Southampton.

June 21—July 5. **BLACKBURN.**—Erection of the new Higher Education School and Swimming Bath on Blakey Moor, for the Corporation. Forms of tender and specifications can be obtained from the Joint Architects, Briggs and Wolstenholme and Stones and Stones, Richmond Terrace, Blackburn, on deposit of £1 1s. Tenders must be sent to Lewis Beard, Town Clerk, Town Hall, Blackburn. Contractors are advised to send their names to the architects immediately.

June 21. **WAKEFIELD.**—Installation of a new heating boiler at Clayton provided school, also execution of alterations at Royston provided school (builder, joiner, plumber, and plasterer), for the West Riding Education Committee. Plans, etc., may be obtained of the West Riding Architect, County Hall, Wakefield. A deposit of £1 must be sent to the West Riding Treasurer. Tenders to be sent to Francis Alvey Darwin, Clerk of the County Council, County Hall, Wakefield.

June 21. **STOCKPORT.**—Erection of a bridge (of brick and stone, with steel girder flooring) over the Ashton Canal at Broadstone Road, for the Corporation. Plans and drawings and general conditions, specification, and bill of quantities, with form of tender, on deposit of £2 2s. with John Atkinson, A.M.Inst.C.E., Borough Surveyor, Town Hall, Stockport. Tenders, addressed to the Chairman of the Borough Extension Committee, to be delivered at the Borough Surveyor's office. Fair wages clause.

June 22. **DISTINGTON.**—Erection of two cottages for W. Jennings. Plans and specifications of W. G. Scott and Co., Architects and Surveyors, 2, Park Lane, Workington, to whom tenders are to be sent.

June 22. **CLEATOR MOOR.**—Altering the Central Premises, Jacktrees Road, Cleator Moor, for the Cleator Moor Co-operative Society, Limited. Plans and specifications at the General Office, Cleator Mocr, where tenders are to be sent.

June 22. **ABBEYFEALE.**—Erection of a central creamery at Abbeyfeale, according to plans, etc., prepared by J. Fant, which may be inspected at the office of M. A. Greaney, secretary, Abbeyfeale Co-operative Creamery, Ltd., Station Road, Abbeyfeale.

June 22. **QUAKER'S YARD (WALES).**—Erection of a retaining wall at the South Wales and Monmouthshire Truant School, Quaker's Yard. Particulars at the office of C. M. Davies, Architect, 112, High Street, Merthyr Tydfil. Tenders to be delivered to E. Stephens, Clerk, Town Hall.

June 22. **LOUISVILLE, MONOGHAN (IRELAND).**—Erection of a new laboratory and additions to the boarding-school convent of St. Louis, Louisville, Monaghan. Plans and specification of J. J. M'Donnell, architect, 27, Chichester Street, Belfast, to whom tenders are to be sent.

June 22—July 2. **HUNGERFORD (BERKS.).**—Erection of a new school for 600 scholars at Hungerford, for the Education Committee. Names, together with deposit of £3 3s. for bills of quantities, to be sent to the Secretary to the Education Committee, The Forbury, Reading, Berks, to whom, also, tenders are to be sent.

June 22. **TAUNTON.**—Erection of a new head post office at Taunton, for the Commissioners of H.M. Works and Public Buildings. Drawings, specification, and a copy of the conditions and form of contract, may be seen on application at the Taunton post office. Bills of quantities and forms of tender may be obtained, on deposit of £1 1s. with the secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., to whom tenders are to be sent.

June 22. **EAST HAM.**—Externally repairing, painting, etc., Shaftesbury Road school; also cleansing and whitewashing latrines and urinals at nineteen schools, for the East Ham Education Committee. The work must be done during the summer vacation. Specifications and forms of tender at the Education Office, Wakefield Street, East Ham. £5 Bank of England note, or crossed cheque of equal value with each tender. Tenders must be delivered to H. C. Padgett, Secretary, Education Office, East Ham. Fair wages clause.

June 22. **NEWPORT (MON.).**—Carrying out the following works, for the Monmouthshire Education Committee:—(1) extension and alterations at the Llangwm Council School, near Usk; (2) reconstructing playground, New Tredegar Infants' Council School; (3) construction of approaches to the Cwmsyfiog Infants' Council School, near New Tredegar; (4) asphalting playground at Norton's Cross Council School, near Monmouth. Plans and specifications can be had from John Bain, Architect, County Council Offices, Newport. Tenders, in separate envelopes for each school, to be sent to C. Dauncey, Secretary, County Council Offices, Newport, Mon.

June 23. **PENISTONE (near SHEFFIELD).**—Formation of new cattle market at Penistone in accordance with plans and specifications by the Architect, H. J. Brettoner, for the U.D.C. Plans and specifications on deposit of 10s. 6d. with Chas. Hodgkinson, Clerk to the Council, Penistone, to whom tenders are to be sent.

June 23. **WINCHESTER.**—Erection of a new secondary school (for 160 girls) at Winchester, for the C.C. of Southampton. Plans, specification, and conditions of contract, and bills of quantities, etc., of W. J. Taylor, county surveyor, The Castle, Winchester. Deposit of £5 5s. by cheque, payable to the Hants C.C. and crossed Bank of England. Tenders to be delivered to H. Barber, Clerk of the C.C., The Castle, Winchester.

June 23. **DUBLIN.**—Erection of 50 labourers' dwellings as follows, for the North Dublin R.D.C.:—Coolock, E.D., Grange, 3 cottages in one block; Willsboro', one cottage; Howth, E.D., 12 cottages in blocks of 6; Sutton (Burrow), 18 cottages in blocks of 3 each; Drumcondra, Rural—Dardistown, one cottage; Killester, North, 2 cottages; Stormanstown, one cottage; Finglas, E.D., Tolka, 4 cottages, in blocks of 2 (Mrs. Bayly's), one cottage (Mrs. Maffit's); Springmount, 4 cottages, in 2 blocks. Plans, etc., can be obtained from John O'Neill, Clerk of the Council, North Brunswick Street, Dublin, on payment of 5s. (Sureties required).

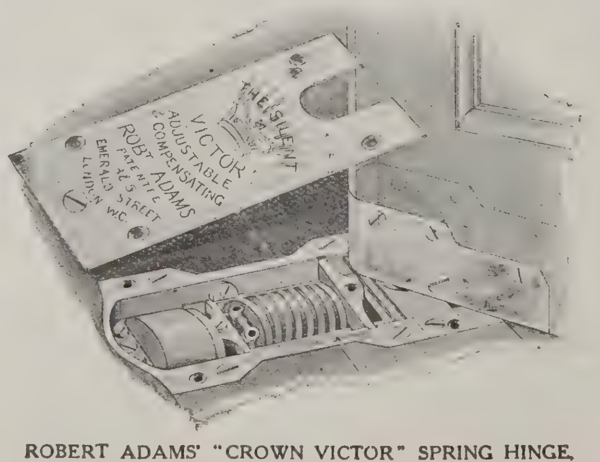
June 24. **LLANELLY.**—Erection of a new building for the Llanelly Y.M.C.A. Plans and specifications can be seen with W. Griffiths, F.S.I. architect, Llanelly, of whom bills of quantities may be obtained on deposit of £1 1s. Tenders to be delivered to J. Wesley Jones, Pencastell, Llanelly.

June 24. **LEEDS.**—Erection of the Chapeltown Council Infants' School, for the Education Committee. Applications for quantities to be sent to the Education Department (Architect's Section), Calverley Street, Leeds. Tenders to be delivered to James Graham, Secretary for Education, Education Offices, Leeds.

June 24. **LEEDS.**—Construction of the following works required for proposed skating rink at Roundhay Road:—Excavation, drainage, brickwork, and masonry; carpenter and joiner; plumber and glazier, plasterer, painter and decorator, steelwork, electric lighting. Plans, specification, quantities, etc., on deposit of 10s. with Myers-Beswick and Partners, Engineers, 8, Park Square, Leeds.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.

PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE,
with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.

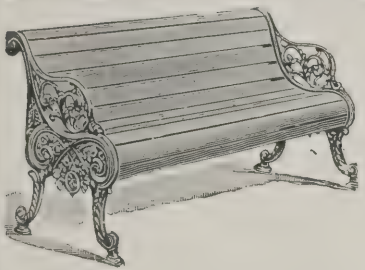
60 HIGHEST AWARDS.

The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing.

— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

CARRON

Garden Furnishings.



The World's Standard.

Are far in advance of the next best in quality, efficiency and appearance. Cost no more than the ordinary kind.

"CARRON" Garden Rollers can be supplied with single or double Cylinders. All made with round edges, easy running, and fitted with well-balanced handles.

"CARRON" Garden Seats are manufactured from specially-seasoned wood, enabling them to withstand climatic changes, and rendering them admirably adapted for outdoor use.

The selection of Garden Furnishings includes **GARDEN SEATS** of all descriptions, **GARDEN ROLLERS, GARDEN TABLES, LAWN BOARDERS,** etc.

Write for No. 8 Garden Furnishing List.

CARRON COMPANY
INCORPORATED BY ROYAL CHARTER 1773

CARRON, Stirlingshire.

MINTON,
HOLLINS & Co.

DIEU ET MON DROIT

TILES
FAIENCE
MOSAIC

· BY · ROYAL · APPOINTMENT ·

HEAD OFFICE,
PATENT TILE WORKS, STOKE UPON TRENT.

LONDON OFFICE,
109 GREAT PORTLAND STREET, W.

The Renowned
Andrews-Hawksley

Patent Tread

Applied to Wood, Iron, Stone or Concrete Stairways, Floors, Landings, Platforms, Non-Conducting Floor Plates for Electric Light and Power Stations, Pavement Covers, etc., etc.

Pioneers of all Stair Treads.
The Tread that has lasted a lifetime.
There is nothing to equal it in the Market.

Architects and Engineers are invited to inspect our New Iron Staircase and Stair Tread made and laid by us at St. James's Park Station (District Railway).

Quotations given for Concrete Steps fitted complete with our Treads.

Quotations given for Concrete Steps fitted complete with our Treads.

REGISTERED TRADE MARK.

Used by Great Western Railway, London and North Western Railway, London Brighton and South Coast Railway, Great Northern Railway, Midland Railway, North Eastern Railway, North British Railway, Lancashire and Yorkshire Railway, H.M. Office of Works, War Office, Admiralty, etc.

Specialists in Light Constructional Work in Iron or Steel; Special Work in Wrought or Cast Iron; Staircases of every description; Concrete and Granolithic Work, etc.

Fire Escape Staircases with our Treads, a Speciality.

THE ANDREWS-HAWKSLEY PATENT TREAD & ENGINEERING COMPANY,

Columbia Works, Prestons Road,
POPLAR, LONDON, E.

Telephone No. 700 Eastern.
Telegrams: "Uniflorous, London."

June 24. **SOUTHAMPTON.**—Erection of two semi-detached small holdings dwelling-houses, at North Stoneham, for the C.C. Plans, specifications, and conditions of contract (no quantities), etc., of W. J. Taylor, County Surveyor, The Castle, Winchester. Tenders to be sent to H. Barber, Clerk of tthe County Council, The Castle, Winchester.

June 24. **KIRKBURTON.**—Builder, joiner, slater, plasterer, plumber and painter works, in the erection of a new (mixed) school, for the West Riding Education Committee. Plans, etc., may be seen on application to the West Riding architect, County Hall, Wakefield. £1 deposit to be sent to the West Riding treasurer. Tenders to be sent to Francis Alvey Darwin, Clerk to the C.C., County Hall, Wakefield.

June 25. **MANCHESTER.**—Construction of a battery house at Dickinson Street generating station, for the Corporation. Forms of tender, etc., of F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester, on deposit of £2 2s. Tenders to the Chairman of the Electricity Committee, Town Hall.

June 25. **LONDON.**—Erection of a bandstand, composed of wood and tiles, at Boundary Street Garden, Bethnal Green, for the L.C.C. Drawing and specification, form of tender, and other particulars, at the architect's department, 19, Charing Cross Road, W.C., upon deposit of 10s. with the cashier of the Council, at the County Hall, Spring Gardens, S.W. Tenders to be delivered at the County Hall, addressed to the Clerk of the L.C.C., Spring Gardens, S.W. Fair wages clause.

June 25. **ORMSIDE (near APPLEBY).**—Erection of an additional block, 97ft. in length, consisting of two wards with kitchen and nurses' room, lavatories, bath, w.c., etc., in connection with the Joint Infectious Hospital at Ormside. The building will be constructed of match boarding on brick foundations, and will be covered with corrugated iron. Plans and specifications by appointment of the borough surveyor, Appleby. Tenders to be delivered to Wm. Hewitson, clerk to Joint Hospital Committee, Appleby.

June 26. **CULGAITH.**—Erection of a new classroom at the Culgaith School. Plans and specifications, at the Vicarage, Culgaith, or at the offices of the architect, Jos. Graham, Castle Street, Carlisle.

June 28. **SHARLSTON.**—Erection of a central Sunday school, near S. Luke's Church, Sharlston; drawings and specifications may be seen at S. Luke's Lodge, Sharlston, near Wakefield, on deposit of £1.

June 28. **DORCHESTER.**—Repairs at the following schools, for the Dorset Education Committee:—Bothenhampton, Buckhorn Weston, Caundle Stourton, Charmouth, Gillingham, Handley, Lytchett Matravers, Lytchett Minster, Stour Provost, Stratton, Swyre, Yetminster. Tenders to be sent to the Secretary, County Education Office, Dorchester.

June 28. **DROXFORD (HANTS.).**—Taking up a stone floor and replacing same with wood, and certain other repairs, painting, etc., at the Droxford Workhouse, for the Guardians of the Union. Specifications may be had from the Clerk, or at the Workhouse, Droxford. Tenders to be delivered to Godfrey Pearson, Clerk, Bishop's Waltham.

June 28. **BIGGLESWADE.**—Erection of a block of Church of England schools, Biggleswade, for the Foundation Managers. Bills of quantities and form of tender may be obtained of Thomas Cockrill, A.M.Inst.C.E., Architect, Market Square, Biggleswade, on deposit of £2 2s. Drawings, specifications and conditions of contract, may be inspected at the office of the Architect. Tenders must be delivered to P. A. Smith, Secretary to Building Committee, "Elmhurst," Drove Road, Biggleswade.

June 28. **GREENFIELD (near HOLYWELL).**—Erection of a new Council School, to accommodate 350 children, at Greenfield, for the Flintshire Education Committee. Plans and specifications at the offices of Samuel Evans, County Surveyor, Mold, on deposit of £2 2s. Tenders to be sent to Fred. Llewellyn Jones, Secretary, Mold.

June 28. **GLASGOW.**—Execution of works:—1, digger, mason, brick, and steel; 2, carpenter, joiner, glazier, and ironmonger; 3, plumber; 4, plaster; 5, tile and marble; in connection with Glasgow Royal Infirmary reconstruction. Drawings at the office of the architect, James Miller, A.R.S.A., 15, Blythswood Square. Copies of schedules on deposit of £1 1s. with Peter Rintoul, secretary, 212, West George Street, Glasgow.

June 29. **REDGRAVE.**—Enlargement of the school for the managers. Plans and specifications of the Rector, Redgrave.

June 29. **PLAISTOW, E.**—Erection of a new ward block in Upper Road, Plaistow, E., for the Trustees of the St. Mary's Hospital for Women and Children. Bills of quantities, etc., up to June 19, of the Trustees' Architect, A. Saxon Snell, F.R.I.B.A., 22, Southampton Buildings, Chancery Lane, W.C., and deposit of £10 Bank of England note. Tenders to be sent to Percy J. Glenton, Secretary to the Hospital.

June 29. **LOWESTOFT.**—Erection and completion of an additional ward pavilion and for addition to the administrative block at the Sanatorium, Rotterdam Road, for the Urban Sanitary Authority. Plans, etc., at the office of G. H. Hamby, A.M.I.C.E., Borough Surveyor, Town Hall, Lowestoft, on deposit of £2 2s.. Tenders, addressed to the Chairman of the Sanitary Committee, to be sent to the Borough Surveyor.

June 29—July 20. **EAST HAM.**—Erection of school buildings, to accommodate 1,032 children, at Vicarage Lane, East Ham, for the Corporation. Deposit of £50 Bank of England note or crossed cheque required. Plans and specifications, etc., of the Committee's Architect, R. L. Curtis, 11 and 12, Finsbury Square, London, E.C. Tenders to be sent to H. C. Padgett, Secretary, Education Offices, East Ham, E. Fair wages clause.

June 30. **MALDON (ESSEX).**—Structural alterations and repairs at the Steeple Council Schools, for the Education Committee. Specification and further particulars of F. H. Bright, Clerk, Maldon D.S.C., 53, High Street, Maldon, to whom tenders are to be sent.

June 30. **BARNET.**—Erection and completion of a new County Council school at Barnet; accommodation, 456. Drawings, specification, etc., at the County Surveyor's Office, Hatfield. Schedule of works (quantities) and form of tender at the County Surveyor's office, upon deposit of £2 2s. Tenders must be delivered to Urban A. Smith, County Surveyor, County Surveyor's Office, Hatfield.

July 3. **MEXBOROUGH.**—Asphalting, building retaining wall, and improvements to urinals, at Mexborough Garden Street and Doncaster Road provided schools, for the West Riding C.C. Specifications of W. R. Hudson, Education Office, Mexborough, to whom tenders are to be sent.

July 3. **GUILDFORD.**—Erection of a receiving home for children, for the Guardians of the Union. Plans, specifications, etc., on deposit of £3 3s. with Edward L. Lunn, Architect, 36, High Street, Guildford. Tenders must be delivered to W. S. V. Cullerne, Clerk to the Guardians, Union Offices, Commercial Road, Guildford.

July 6. **LUTON.**—Erection of a new public library for the Corporation. Plans and specification by S. F. L. Fox, A.M.I.C.E., Borough Engineer and Surveyor, Town Hall, Luton, of whom plans, etc., may be obtained on deposit of £3 3s. with the Borough Accountant. Tenders to be sent to Bruce Penny, Town Clerk, Town Hall, Luton.

No Date. **SOUTH NORMANTON.**—Erection of a public elementary school for 412 infants at South Normanton, for the Derbyshire Education Committee. Bills of quantities of Percy B. Houlton, architect, Furnival Chambers, Chesterfield.

No Date. **BUBWITH (SELBY).**—Execution of repairs, etc., to the tower of Bubwith Parish Church, for the Vicar and Churchwardens. Particulars may be had on application to the Bubwith Vicarage, Selby.

No Date. **WILLINGTON (near DERBY).**—Erection of coal stores, small gas generating house and tower, and boundary wallings, drainage, etc., at Willington House. Quantities on deposit of £1 1s. Particulars may be obtained of E. R. Ridgway, architect, Market Place, Long Eaton.

No Date. **CURRAGH (IRELAND).**—Erection of 14 cottages. Plans and specifications may be obtained on application to R. Walsh, Maddenstown, Curragh.

ENGINEERING.

June 14-29. **SOUTHAMPTON.**—Construction of a scheme of drainage, together with settling tanks and three 62ft. circular bacteria beds, also a 70,000 gallon rain-water tank, together with alterations to the system of rain-water drainage at the Hants County Asylum, near Fareham, for the C.C. Plans, specification, and conditions of contract, bills of quantities, and all other information, of W. J. Taylor, county surveyor, The Castle, Winchester, on and after June 14, on deposit of £10 10s. Tenders must be sent to J. Railton Wyatt, clerk to visiting committee, Hants County Asylum, Fareham.

June 18-28. **LEITH, EDINBURGH.**—Laying main drains for sewage and surface water from the Redford Estate, and constructing new timber bridge over the Waters of Leith, Edinburgh, in the Scottish Command, for the Secretary of State for War. Plans, etc., of the Director of Barrack Construction, 80, Pall Mall, London, S.W., or at the Barrack Construction Office, Room No 226, Headquarters, Scottish Command, Edinburgh. Deposit of 10s. required. Tenders to be sent to H. De la Bere, Director of Army Contracts, War Office, Whitehall, London, S.W.

June 22. **RHOSNEIGR (ANGLESEY).**—Sinking a well and bore-hole at Rhosneigr, for the Valley R.D.C. Specification, etc., of the Engineer to the Council, F. H. Bancroft, A.M.I.C.E., F.S.I., 88, Mosley Street, Manchester. Tenders to be sent to Owen J. Hughes, Clerk to the Council, Board Room, Union Workhouse, Valley, S.O., Anglesey.

June 23. **DUNBAR.**—Construction of a new service tank, with a capacity of about 300,000 gallons on the lands of Broomhouse, near Dunbar, for the T.C. Drawings may be seen at the office of the Engineers, Warren and Stuart, 94, Hope Street, Glasgow, where copies of the specification and schedule of quantities can be obtained on deposit of £1 1s. Tenders to be lodged with Warren and Stuart.

June 24. **DRIFFIELD.**—Sinking a well, 6ft. internal diameter and 216ft. deep, with other work in connection therewith at Nafferton, for the R.D.C. Drawings and specification at 23, Exchange Street, Driffield. Specification, form of tender, etc., of the Engineers, Fairbank and Son, C.E., Lendal Chambers, York, on deposit of £3 3s. Tenders to Herbert Botterill, Clerk to the R.D.C., 23, Exchange Street, Driffield.

June 30. **CARDIFF.**—Installation of a new heating apparatus at St. Catherine's Church, for the Committee. Tenders to be sent to the Secretary, 14, Pontcanna Road, of whom particulars may be obtained.

June 30. **REPTON.**—Provision, laying, and jointing of about 1¼ miles of 9in. and 6in stoneware pipe sewers, together with manholes, lampholes, and flushing chambers; also construction of liquefying tank, etc., for the R.D.C. Drawings and specifications, etc., on deposit of £3 3s. with F. A. Pickles, Assoc.M.Inst.C.E., 11, Park Row, Nottingham. Tenders to be delivered to C. F. Chamberlin, Clerk to the Council, Union Offices, Burton-on-Trent.

July 6. **LONDON.**—Construction of a sewer, mainly of cast-iron, lined with concrete, and blue brick, of 6ft. to 8ft. internal diameter, and of a total length of about 42,450ft., to be formed mainly in tunnel, together with penstock and weir chambers, and other incidental works, from Northside, Wandsworth Common, Battersea, to the Deptford pumping station, Greenwich, for the L.C.C. Drawings, specifications, bills of quantities, form of tender, and other particulars, of the chief engineer, Maurice Fitzmaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon deposit with the cashier of the Council of £10. Tenders to be delivered at the County Hall, addressed to the Clerk of the L.C.C., Spring Gardens, S.W.

IRON AND STEEL.

June 21. **GLASGOW.**—Supplying steel work to be executed in the renewal of six underbridges on the main line at 94 miles 48 chains, 106 miles, 69 chains, 107 miles 9 chains, 112 miles 22 chains, 116 miles 33 chains, and 126 miles 74 chains, for the Caledonian Railway Company. Drawings, etc., at the offices of the Company's District Engineer, 16, Killermont Street, Glasgow, where specification and schedule may be obtained on deposit of £2 2s. Tenders to be sent to J. Blackburn, Secretary, Caledonian Railway Company's Offices, 302, Buchanan Street, Glasgow.

June 21. **SWINDON.**—Supplying the undermentioned stores from July 1, 1909, to June 30, 1910, for the Great Western Railway:—Laminated springs, helical and volute springs, tyres, straight axles, crank axles, and locomotive forgings, steel plates and sheets, steel bars and blooms, steel castings, iron forgings, chain and special iron for chain manufacture, tubes and fittings, solid drawn steel tubes, cast-iron socket pipes, lamp posts, etc., tool steel, galvanised corrugated iron sheets. Specifications and forms of tender may be obtained on application to the Stores Superintendent at Swindon. Tenders to be sent to G. K. Mills, Secretary, Paddingtdon Station, London.

June 21. **MANCHESTER.**—Supply and delivery to the Corporation Sewage Works, Davyhulme, Urmston, of 52 tons or thereabouts of rolled steel joists, of approved English manufacture, for the Corporation. Forms of tender, containing full particulars, may be obtained on application to the Secretary of the Rivers Department, Town Hall, Manchester, and must be sent to Wm. Henry Talbot, Town Clerk, Rivers Department, Town Hall, Manchester.

June 24. **BILLINGE (near WIGAN).**—Supply of about ten tons cast iron water pipes, 3in., 4in., and 6in. diameter, hydrants, valves, and other fittings, for the U.D.C. Particulars on application to the Surveyor, Council Offices, Billinge.

June 29. **SILSDEN.**—Supplying and laying 12in. cast-iron water mains and the taking out and relaying 8in. water mains; also excavating for laying the above, for the U.D.C. Plans and specifications, and bills of quantities, from Henry Longbottom, Surveyor to the Council. Tenders to be sent to John Driver, Clerk to the Council, Town Hall, Silsden.

June 29. **WEST HARTLEPOOL.**—Supply and delivery of wrought iron unclimbable fencing for the Corporation. Specification can be had from Nelson F. Dennis, M.I.C.E., Borough Engineer and Surveyor, Municipal Buildings. Seaton Carew, conveniences (Corporation to fix), 55 yards fencing, 5ft. high in 9ft. bays, 21 yards fencing 5ft. high to 10ft. radius, and short lengths 4ft. high; also 2 small gates with C.I. pillars. Stranton cemetery (contractor to fix, in Brierton Lane), 425 yards ornamental fencing 5ft. high in 10ft. bays, with C.I. standards, etc., and 1 pair gates with C.I. pillars. Tenders to be sent to the Town Clerk's Office, 78, Church Street.

Sept. 1. **LONDON, for BRISBANE (QUEENSLAND).**—Supplying 42in. and 48in. steel pipes, or 42in. and 48in. wrought iron pipes, or 42in. and 48in. cast-iron pipes, for the Brisbane Board of Water Works. Specifications and drawings may be obtained at the office of the engineer to the agent-general for Queensland, 409 and 410, Strand, London, W.C., on payment of £3 3s. Tenders must be sent addressed to the secretary, Brisbane Board of Water Works, Brisbane, Queensland.

No Date. **KEIGHLEY.**—Supplying iron pipes, valves, etc., for tanks and filters in connection with the new sewage disposal works, Uncra, for the Corporation. Specifications and quantities may be 'had, with further particulars, from Walter Fowlds, A.M.I.C.E., Borough Engineer.

PAINTING.

June 21. **WIGAN.**—Cleaning, painting, etc., at the Sanatorium, Whelley, for the Corporation. Specification and other particulars of the Borough Engineer, King Street West. Tenders must be delivered to Harold Jevons, Town Clerk.

June 21. **WREXHAM.**—Painting the cemetery lodge, for the Corporation. Forms of tender and specification at the Borough Surveyor's office, Willow Road. Tenders to be delivered to Lawson Taylor, Town Clerk, Guildhall, Wrexham.

June 21. **HEPTONSTALL.**—Cleaning, painting, and decorating Heptonstall parish church. Specifications may be obtained and designs seen at the offices of Sutcliffe and Sutcliffe, F.S.I., architects, New Road, Hebdenbridge, to whom tenders are to be sent.

June 21. **HASTINGS.**—Painting, limewashing, repairs, etc., at several of the schools during the summer holidays, for the Corporation. Specifications may be obtained at the office of the Borough Engineer, Town Hall, Hastings. Tenders to be sent to Philip O. Buswell, Clerk to the Committee, 18, Wellington Square. Tenders are invited from local tradesmen.

June 21. **LONDON.**—Painting and sundry other works at Asylums in Cleveland Street, W., and in Colindale Avenue, The Hyde, Hendon, N.W., for the Central London Sick Asylum District. Specifications by appointment, and bills of quantities of the architect, William Lockwood, 12, Sherwood Street, Piccadilly Circus, W., on deosit of £3 3s. Tenders to the Board of Management, Clerk's Office, "Cleveland Street Asylum.

June 22. **HORNSEY.**—Painting, cleaning, repairs, etc., at the Council Schools, during the summer holidays, for the Corporation. Particulars may be obtained from the Acting Secretary for Education, 206, Stapleton Hall Road, Stroud Green, N., to whom tenders must be delivered.

June 22. **EAST HAM.**—Painting, cleansing, reairs, etc., of public buildings, for the Corporation. Specification, etc., of John G. Morley, Borough Engineer, Town Hall, West Ham, E., upon deposit of £1. Tenders to be sent to the office of the Town Clerk, Town Hall, West Ham, E., in the envelope supplied, by registered post. Fair wages clause.

June 22. **THORNHILL.**—External painting at the Council offices and depot, Thornhill Administration Building. Bunkers Hill, Sewage Works, Mill Bank, and Smithy Brook, and the external and internal painting of the waterworks pumping station, Edge Top, Thornhill, for the U.D.C. Specification, bills of quantities, and form of tender on application to A. Rothera, Engineer and Surveyor to the Council, Council Offices, Thornhill. Tenders to be sent to J. H. Dyson, Clerk to the Council, Council Offices, Thornhill. Fair wages clause.

June 24. **LONDON.**—Cleaning and painting at the casual wards, Holmes Road, N.W., also for internal cleaning and painting at St. Margaret's Receiving Home for children, Leighton Road, N.W., for the Guardians of the Poor of the Parish of Saint Pancras. Tenders to be sent to Alfred A. Millward, Clerk to the Guardians, Town Hall, Pancras Road, N.W.

June 24. **LEEDS.**—Painting and cleaning schools during the midsummer vacation, for the Education Committee. Names to the Education Department (Architect's Section), Calverley Street, Leeds.

June 24. **GREAT HORTON.**—Painting, inside and outside Great Horton Primitive Methodist Chapel, during September. The chapelkeeper will show the premises, and a copy of specification can be obtained from him on payment of 2s. 6d.

June 29. **LEYTON.**—Cleansing, painting, and repairs at four schools, improvement of gas lighting at two schools, to be executed during the summer vacation, and hot-water heating apparatus, at Sybourn Street School, now in course of erection, for the U.D.C. Specifications, conditions and forms of tender of William Jacques, A.R.I.B.A., 2, Fen Court, Fenchurch Street, E.C., on deposit of £1 (cheques will not be accepted). Tenders must be delivered at the meeting of the council to be held on June 29 at 7 p.m. Fair wages clause.

July 1. **WALWORTH, S.E.**—Painting, cleaning, etc., work at the Southern Relief Station, Boyson Road, Walworth, S.E., for the Southwark Union, London. Specification, etc., of Sydney Wood, Clerk, Union Offices, John Street West, Blackfriars, S.E., to whom tenders are to be sent. Fair wages clause.

July 1. **EAST DULWICH.**—Painting, cleaning, etc., work at the Infirmary, East Dulwich Grove, S.E., for the Southwark Union, London. Specification, etc., of the Architect, A. W. Tribe, 120, Clapham Road, S.W., on deposit of £2 2s. Tenders to be sent to Sydney Wood, Clerk, Union Offices, John Street West, Blackfriars Road, S.E. Fair wages clause.

No Date. **MERIONETH.**—Painters' work at the Corwen Council School, for the Education Committee. Specification and further particulars of the County Architects, Deakin and Howard Jones, M.S.A., Plas Ynys, Borth, R.S.O.

PLUMBING AND SANITARY.

June 23. **FLIMWELL.**—Construction of a sewage tank, with manholes and other appurtenances, and relaying certain glaced stone ware pipes drains, etc., in connection with drainage of the Ticehurst Union Workhouse at Flimwell. Plans and specifications may be seen with W. E. Mitchener, at Hurst Green. Tenders to be sent to J. C. Lane Andrews, Clerk to the Guardians, Union Offices, Wadhurst.

June 25. **SUTTON COLDFIELD.**—Sewering and draining Hill and Streetly Districts, and laying a length of sewer in Riland Road, including manholes, sewage lift, flushing chambers, etc., for the corporation. Specification, form of tender, and bills of quantities on deposit of £5. Tenders to be addressed to the town clerk, Council House, Sutton Coldfield.

June 26. **WINDSOR.**—Forming connections between house drains and sewers in the parish of Clewer Without from and after June 30, for the R.D.C. Conditions from the surveyor to the council, W. Menzies, Englefield Green, Surrey. Tenders must be delivered to J. E. Gale, clerk, 3, Sheet Street, Windsor.

June 28. **ANSTON.**—Laying about 3,900 yards of 9in. and 6in. stoneware pipe sewers, construction of manholes, tanks, filters, and other appurtenant works at Anston, for the Kiveton Park R.D.C. Drawings and copies of the specification, bill of quantities, and form of tender at the offices of the engineers, Berrington, Son and Watney, Bank Buildings, Lichfield Street, Wolverhampton, and 28, Victoria Street, Westminster, S.W., on deposit of £5s. 5s. Tenders must be delivered to James Snow Whall, solicitor, Clerk to the Council, 66, Bridge Street, Worksop.

June 30. **MANCHESTER.**—Construction of an underground lavatory for males at the Poultry Market, Shudehill, for the Corporation. Drawings may be seen and specification, bill of quantities, and form of tender obtained, at the office of the City Surveyor, Town Hall, Manchester, on deposit of £1 1s. with the City Treasurer. Tenders, addressed to the Chairman of the Lavatories Sub-Committee, to be delivered at the City Surveyor's office.

ROADS AND CARTAGE.

June 21. **KEIGHLEY.**—Paving Bar Lane, Riddlesden, for the Keighley R.D.C. Plans may be seen and bills of quantities and specifications obtained, from Thomas Burton, 248, Oakworth Road, Keighley. Tenders to be sent to J. N. Clarkson, Clerk to the Council, 40, North Street, Keighley.

June 21. **GRIMSBY.**—Tar sanding and repair of the playgrounds of all the Council schools, for the Corporation. Specifications and full particulars may be obtained at the Education Offices. Tenders to be sent to Douglas Chandler, Clerk to the Education Authority, Education Offices, Grimsby.

June 21. **LONDON.**—Making-up and paving Southcroft Road, Streatham, for the Corporation of Wandsworth. Specification, etc., of the Borough Engineer, New Streets Department, 56, East Hill, Wandsworth, S.W. Tenders must be delivered at the Council House, East Hill, Wandsworth, S.W. Fair wages clause.

June 21. **HULL.**—Supplying about 800 tons 3in. by 6in. granite or whinstone setts, for the Corporation. Forms of tender and other particulars may be obtained of A. E. White, M.Inst.C.E., City Engineer, Town Hall, Hull. Tenders, addressed to the Chairman of the Street and Lighting Sub-Committee, to be delivered at the Town Clerk's office.

June 21. **BELFAST.**—Paving with square stone setts portion of roadway in the goods yard, for the Great Northern Railway Company (Ireland). Plan and specification at the Office of W. H. Mills. Engineer-in-Chief, Amiens Street Terminus, Dublin; or copies of the District Engineer, Belfast, on payment of 1s. each. Tenders to be sent to T. Morrison, Secretary, Secretary's Office, Amiens Street Terminus, Dublin.

June 24. **THORNTON HEATH.**—Tarpaving playgrounds at Winterbourne Road Council Schools, Thornton Heath, for the Corporation of Croydon. Specification, etc., of the Clerk to the Education Committee, Education Office, Katharine Street, Croydon. Tenders must be delivered to James Smyth, Clerk, Education Office, Katherine Street, Croydon.

June 26. **LEWES.**—Scarifying and steam roadrolling, for the Corporation. Forms of tender and further information can be obtained at the Borough Surveyor's Office, Town Hall, Lewes. Tenders to be left at the office of Montague S. Blaker, town clerk, Town Hall, Lewes.

June 26. **BEDWELLTY (WALES).**—Construction of a new road from Aberbargoed to Cwmsyfiog, and extension of road from Pengam to Fleur-de-Lis, for the U.D.C. Plans and specifications and forms of tender on application to the Council's Surveyor, J. H. Lewis, Assoc.M.Inst.C.E., Blackwood, Mon., upon deposit of £3 3s. Tenders to be delivered to T. J. Thomas, Clerk to the Council, Bargoed, Glam.

June 26. **ACOCK'S GREEN.**—Making up Douglas Road, Acock's Green, for the Yardley R.D.C. Plans, etc., of the Engineer and Surveyor, Arthur W. Smith, Council House, Sparkhill, near Birmingham. Bill of quantities and form of tender on deposit of £1 1s. Tenders to be delivered to Francis Ladbury Thompson, Clerk to the Council, Council House, Sparkhill, near Birmingham. Fair wages clause.

June 28. **ARUNDEL.**—Supply and delivery of 300 cubic yards of clean, hand-picked surface flints, for the Corporation. Form of tender, and particulars, may be obtained of the Borough Surveyor, E. F. Farrington, Town Hall, Arundel, to whom tenders are to be sent.

June 28. **DROXFORD (HANTS.).**—Hire of steam rollers and scarifiers, during the period ending March 31, 1910, for the R.D.C. Forms of tender and conditions of contract of the Clerk, or of A. V. Carter, District Surveyor, Droxford, Hants. Tenders to be sent to H. Godfrey Pearson. Clerk. Bishop's Waltham, Hants.

July 3. **SWANSEA.**—Paving with tar macadam a portion of the playgrounds of the following Council schools:—Terrace Road, Dyfatty, Plasmarl, and Martin Street, Morriston, for the Corporation. Particulars may be obtained from Marcus Hoskins, F.S.I., Borough Estate Agent, Coleridge House, Swansea. Tenders are to be sent to A. W. Halden, Clerk, Education Offices, Swansea.

MISCELLANEOUS.

June 21. **MIDDLESBROUGH.**—Supplying sanitary pipes, timber, bricks, concrete flags, and kerbs, Portland cement, annealed scoriae blocks, paving setts, broken macadam and slag, tar macadam, manhole covers, and frames, gully grates, flushing boxes, etc., from July 1, 1909, to March 31, 1910, for the Corporation. Specifications and schedules of S. E. Burgess, M.Inst.C.E., Borough Engineer, Municipal Buildings, Middlesbrough. Tenders are to be sent to Alfred Sockett, Town Clerk, Municipal Buildings, Middlesbrough.

THE

Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:

8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,

General Manager and Secretary.

Telephone: 5948 Manchester.
Telegraph: "Federated, Manchester."

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE Draughtsman (24), 9 years' experience; structural and ornamental ironwork, desires post in London or Southampton, office or outdoor.—Z., 36, Bartholomew Villas, London, N.W. 5082

ACADEMY (Royal) exhibitor prepares perspectives on moderate terms; specimens sent; also designs, plans from rough sketches, drawings, tracings, competition work, etc.—Box 4983, BUILDERS' JOURNAL Office.

ADVERTISER, with six years' practical experience and a knowledge of bookkeeping and office routine, desires situation in builder's or estate agent's office.—C. J. Mounter, 24, Hillfield Road, West Hampstead, N.W. 5028

ADVERTISER seeks position as junior assistant, 3½ years' experience; excellent draughtsman, surveying, levelling, book-keeping, general office routine; highest testimonials; low salary.—Box 5045, BUILDERS' JOURNAL Office.

AN Architect's junior assistant desires appointment, 5½ years' experience, Lancashire office preferred; specimen drawings, certificates for construction; good references.—J. S. H., Withington Lane, New Springs, Wigan. 5112

AN Architect's Assistant desires re-engagement; town or country; neat and quick draughtsman; thoroughly capable; moderate salary.—M. P., 358, New Cross Road, S.E.

ADVERTISER (19) seeks Situation as Draughtsman, 4½ years' experience; working drawings from rough sketches, good tracer and colourist, knowledge of reinforced concrete construction.—Apply, Box 5106, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant desires re-engagement in a good London office; eight years' experience; good references; experience in competition work.—B. E. Atkinson, jun., 14, Rosslyn Hill, Hampstead, N.W. 5018

ARCHITECT'S Assistant seeks re-engagement; just completed two years with city firm (nine years' experience London and Provinces); good all-round man; highest references; moderate salary.—Box 5099, BUILDERS' JOURNAL Office.

ARCHITECT and Surveyor's Assistant desires engagement, 15 years' experience; working drawings, details, surveys, specifications, levelling, and general routine; excellent references; moderate salary.—O. R., South View, Church Road, Egham. 5095

ARCHITECT'S Junior Assistant, 5 years' experience, neat draughtsman, competitive and domestic work, contract drawings, details, perspectives, assist quantities; honours construction; low salary. —W. Ernest Clarke, Cheam Road, Ewell. 5091

ARCHITECT'S Assistant (23), student R.I.B.A. 6½ years, varied experience, working drawings, details, levelling, surveying, drainage, specifications, quantities; excellent references; town or country; salary moderate.—Bernard A. Dyer, 3, St. Peter Street, Hereford. 5085.

ARCHITECT'S Assistant, 22, qualified, thoroughly caable, well educated, with experience in reinforced concrete; medallist and bursar Glasgow School of Architecture; neat and quick draughtsman, desires appointment for summer months; England preferred; salary moderate.—350, William Porteous and Co., Glasgow. 5110

ARCHITECT, 32, qualified, seeks any position where his services would be available; energetic; disengaged; mod. salary.—Box 5006, BUILDERS' JOURNAL Office.

ARCHITECT, civil engineer (26), building, municipal, and engineering experience, desires immediate appointment; good draughtsman; quantities, surveys, levels, sewage, railway, domestic and industrial buildings; testimonials; moderate salary. —Box 5080, BUILDERS' JOURNAL Office.

ARCHITECT and Quantity Surveyor renders professional assistance, at own office, or elsewhere; any period or distance; contract, competition, perspective drawings.—Box 5104, BUILDERS' JOURNAL Office.

ARCHITECT'S Junior Assistant desires engagement as improver, 3½ years' good London experience; moderate salary.—Box 5087, BUILDERS' JOURNAL Office.

ARCHITECT'S Junior Assistant desires engagement, three years' experience; working plans from rough sketches, good tracer, colourist, and typist; levelling; small salary.—B., 15, Marine Parade, Brighton. 5088

ARCHITECT'S Assistant, engagement wanted; member Society of Architects, 11½ years first-class provincial public and domestic work; drawings, specifications, assist quantities, supervision; permanency; age 27; salary £3 3s. — Box 5081, BUILDERS' JOURNAL Office.

ARCHITECT'S Assistant seeks engagement; 14 years' experience; plans, details, specifications, quantities, surveying, dilapidations, and levelling; excellent references.—C. G., "Brooklyn," Leas Road, Guildford.

A.R.I.B.A., disengaged shortly, London training; chief and senior assistant in leading provincial offices; expert designer, and experienced in all branches.—A. G., "Beverley," Yardley Wood Road, Moseley, Birmingham.

ARCHITECT'S Assistant (22), desires re-engagement in London office; contract drawings, details, surveys, double scholarship holder; Stage III. Building Construction.—Smeed, 24, West Ham Lane, Stratford, E. 5050

ARCHITECT, prepares designs, working drawings, specifications, on moderate terms; assistance rendered, town or country.—Box 5,036, BUILDERS' JOURNAL Office.

ARCHITECT'S Junior Assistant (20), 4½ years' experience, West End and country offices; working drawings, details, perspectives, competitions, general office routine; excellent draughtsman and tracer. Highest references; salary 25s.—G. W. S., 26, Cowley Road, Ilford, Essex. 5056

AS traveller, constructional steel, or founders; good connection architects, builders; good estimating and draughtsmanship; over 22 years' experience.—W. 61, Royal Hill, Greenwich. 5077

BUILDER'S Clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N. 5037

BUILDER'S Book-keeper, 9 years' excellent reference from present employer. All books, double entry, prime costs, accounts, trading and profit and loss accounts, etc.—Box 5049, BUILDERS' JOURNAL Office.

BUILDER'S, Manager, Estimator and Surveyor, seeks re-engagement; competent, reliable, energetic; quantities, estimates, supervision, measure, adjust accounts and variations; entire charge; thorough, practical experience all branches; excellent references.—H., 1, Elmslea Villas, South View, Farnham. 5105

BUILDER'S Assistant (22) desires Situation in town or country, good knowledge of plans, specifications, quantities, measuring, accounts, outside supervision, and setting out.—F. B., 30, Carminia Road, Upper Tooting, S.W. 5101

BUILDER'S Son (22) with 6 years' practical experience, desires situation with a firm of contractors to gain experience; abstainer, excellent references; certificated.—Box 5094, BUILDERS' JOURNAL Office.

CARPENTER, and French polisher wants situation, young, capable workman, good refs.; moderate wage.—C.P., 21, Redstone Road, Redhill, Surrey. 4989

CLERK of Works, disengaged, well up in all trades; levelling and surveying; best references; abstainer.—R. E., 3, Oakfield Road, Stroud Green, London, N. 5[illegible]84

CONTRACTOR'S or surveyor's assistant desires situation; experienced in measuring, levelling, setting out, accounts, supervision; good references, moderate salary for permanency. Could invest small sum.—Box 5074, BUILDERS' JOURNAL Office.

ESTATE Clerk of Works, or otherwise, desires engagement, over 20 years' practical experience, estates and public works, up-to-date knowledge of farm buildings, cottage, saw mill work, and machinery, water supply and drainage, preparing plans and estimates; exceptional testimonials.—Alfred T. Peck, "Lulworth," Hatherley Road, Winchester. 5090

FOREMAN, general or carpenter, conversant all branches, abstainer; time, cost, and stock books; moderate salary.—Box 5093, BUILDERS' JOURNAL Office.

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W. 4951

GENERAL Foreman in the Midlands seeks an engagement; thoroughly competent manager, all trades, wide and varied experience, well up in all details.—Box 5086, BUILDERS' JOURNAL Office.

GENERAL Foreman or Clerk of Works.—Advertiser seeks engagement, extensive experience in charge of large jobs; highest reference as to character and capabilities; eight and a half years in last employ.—W. P., 45, Fernhurst Road, Fulham, S.W. 5115

PAINTING, paperhanging, etc.—Job wanted, new work or otherwise; cottage property.—S. Woodley, 86, Shrewsbury Road, Forest Gate, E. 5116

PLUMBER (gas and hot-water fitter, zinc, etc., good all-round hand) wants constancy in good jobbing firm; age 32; two jobs eleven years.—W. S., 3, Castlenau Terrace, King's Avenue, New Malden, Surrey. 5107

QUANTITY Surveyor's Assistant desires permanent or temporary engagement; taking off, specifications, variations, etc.; varied London experience; excellent references; passed F.S.I. — Box 5100, BUILDERS' JOURNAL Office.

STOREKEEPER and yardman (age 29), seeks re-engagement in builder's yard. Well up in booking materials in and out works. Fifteen years' experience. First-class references. Distance no object.—M. Poole, 12, Jardin Street, Albany Road, Camberwell, S.E. 5117

TRAVELLER, well-known, and with excellent connection with architects and contractors in Liverpool and Lancashire and Cheshire, is desirous of representing first-class firm.—Box 5111, BUILDERS' JOURNAL Office.

Appointments Vacant.

FIRM of Reinforced Concrete Engineers have a vacancy for a pupil. Write giving full particulars to Box 398, Brown's Advertising Offices, 17, Tothill Street, Westminster, S.W. 5098

STOREKEEPER required for Public Works Department in Northern Nigeria for one tour of twelve months' residential service, with possible extension; salary £300 a year, rising annually by £10 to £350; free single quarters and first-class passages out and home again on satisfactory completion of engagement; half salary on voyage out, full salary from date of arrival in Protectorate; two months' leave on full pay granted after 12 months' residential service, increased to four months if returning to Protectorate, full pay during voyage or voyages with free passages; strict medical examination and vaccination if necessary. Candidates must not exceed the age of 40 years; they must have had experience in a similar capacity in charge of general stores used in building construction, be competent bookkeepers; thoroughly conversant with the cost of materials, the principle of allocation, preparation of indents, stocktaking, receipts and issues, and be competent to take out quantities from a drawing. Applications (no special form required), stating age, whether married or single, giving particulars of experience, accompanied by copies (not originals) of testimonials, will be received by the Crown Agents for the Colonies, Whitehall Gardens, S.W., up to 21st June. Quote M3647 on top left-hand corner of letter of application. 5103

WALKING Foreman, to take charge and supervise reinforced concrete, etc., in different parts of the country.—Write, stating experience, age, and wages required, and copies of testimonials, Box 5118, BUILDERS' JOURNAL Office.

WANTED Architect's and Surveyor's Assistant; state full particulars.—Apply, Box 5113, BUILDERS' JOURNAL Office.

Miscellaneous.

FOR SALE.—Principles of Planning, Marks, 5s.; Stresses and Thrusts, Middleton, 3s.; Structural Iron and Steel, Twelvetrees, 4s.; all new; or best offer.—The Firs, Coldred, near Dover. 5120

For **SLIDE RULES** and
Reducing Scales,
Try B. J. HALL AND CO., LTD.,
39, Victoria Street, Westminster.

POLING Boards, selected lengths and thicknesses, best quality and full measure. Also scaffold boards, putlogs, scantlings, deals, battens, and boards. Lowest wharf prices.—C. H. Glover and Co., Ltd., Importers, Hatcham Saw Mills, Old Kent Road, S.E.

SECOND-HAND Optical Mart.
For the Purchase and Sale of
LEVELS, THEODOLITES, DRAWING INSTRS.
— Clarkson's, 338, High Holborn, London, W.C.
(Opposite Gray's Inn Road).

WANTED at once, large quantity second-hand scaffold boards, poles, 28 to 35 ft.; cords and putlogs, in good condition. Price and full particulars.—Box 5053, BUILDERS' JOURNAL Office.

WANTED, 6 copies of THE BUILDERS' JOURNAL for December 21st, 1904. 6d. offered for each copy.—The Publisher, THE BUILDERS' JOURNAL, Caxton House, Westminster, S.W. 5078

WANTED Clay's "School Buildings" and Rivington's "Building Construction III."—Box 5096, BUILDERS' JOURNAL Office.

June 23, 1909. Volume 29. No. 750.

THE BUILDERS' JOURNAL
AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

Leaders :—Concerning Competitions—Architectural Skyscrapers—Canada's Message of Hope, 573; Selby Itself Again—Art and Parsimony—The Prepotency of Gothic ... 574
R.I.B.A.—The Institute Premises—The R.I.B.A. Form of Contract, 574; Assistant Lecturer in Architecture at Giza 575
Societies' Reports :—Birmingham Clerks of the Works and Builders' Foremen's Association—Birmingham Architectural Association—Institution of Gas Engineers 575
Four Readers' Pulpits. By Edwin Gunn, F.R.I.B.A. 576
A Patent System of Earthquake-Resisting Construction 577
Correspondence :—Efflorescence in Walls—Columbia Fir 578
Architectural Copyright 578
Notes on Competitions 578
The Middlesbrough Library Competition ... 579
In Defence of Old Bath 579
Economical Library Construction 580
Buildings in Progress and Completed ... 582
Our Plate 582
The National Gallery Additions. By H. Colin Allen 583
Proposed New Buildings 583
Notes and News 591
Federation News 594
Views and Reviews :—Architecture of the Renaissance in Italy 596
Coming Events 596
Full List of Contracts Open, xxii., xxv., xxvi., xxix., xxx., xxxi.
Tenders ... ... vi., viii.

CONCRETE AND STEEL SECTION.

Leaderettes :—Is Reinforced Concrete Economical?—Construction and Common sense—Earthquakes and Reinforcement—The Financial Standpoint—A Guide to the Foreman and Clerk of the Works 585
The New "King Edward Building" of the G.P.O. 586
Concrete Views and Reviews :—A Catalogue of Reinforced Concrete Construction, 586; Two Pamphlets on Reinforced Concrete Construction—The United Kingdom Fire-Proofing Co.'s Catalogue—Concrete Construction—Hotel in Reinforced Concrete—A French Work on Calculations, 590; Concrete Institute Transactions 591
Special Steelwork Details at the Selfridge Store 589
Built-in Beams. By R. D. Whitehead, A.M.I.Mech.E. 592

ILLUSTRATIONS.

New Synagogue at Boston, Massachusetts, U.S.A. 575
Four Readers' Pulpits :—Chester, 576; Beaulieu, 577; Tupholme, 577; Shrewsbury ... 578
The Royal Library, Berlin :—Ground and third-floor plans, 580; View of one of the upper rooms, 580; View in one of the stock rooms, 581; General View 581
House at Baldock, Herts, Geoffry Lucas, A.R.I.B.A., Architect. Centre plate. Plans 582
Additions to the National Gallery, London :—Fig. 1, view of new main gallery, 583; Fig. 2, reinforced concrete dome roof, 583; Fig. 3, another view of the dome, 584; Fig. 4, formwork for one of the ventilating galleries 584
The "King Edward Building," General Post Office, London :—View of a floor in sorting office block, 585; view of loading yard, detail view of west elevation, 586; erection of stone facade, general view, west elevation 587
The Hennebique Stirrup 587
Special Steelwork Details at the Selfridge Store :—Shop drawing of steel columns—Detail of bent plate girder—Shop Details of Beams 588, 589
Cambridge University Laboratory Extensions. Stevenson and Redfern, Architects: Second floor plan 590; General view of the facade—Interior of one of the laboratories ... 591
Built-in Beams. Diagrams 1 to 6 ... 592, 593

Concerning Competitions.

In the bitterness of heart engendered of recent events, some architects are just now denouncing competitions, lock, stock, and barrel, declaring that they are vicious in principle, wasteful in practice, and ought to be abolished. In their calmer moments, these immoderate censors will no doubt admit that such extreme views are unpractical, if not untenable. Upon a reasoned consideration, it is very obvious that competitions, properly managed, are by no means destitute of estimable advantages. It is true that the enormous waste of effort they involve, especially in the case of open competitions, cannot be denied. The aggregate cash value of the time vainly expended in an extensive competition—like that, for instance, at Middlesbrough—may possibly be reckoned at thousands of pounds sterling. Certainly, at the first blush, this looks like so much dead loss to the profession. But is it? We are inclined to suppose that most of the competitors enjoy a considerable rebate, made up of various more or less unconsidered trifles. The competitors strengthen their powers and enlarge their experience by the exercise, which teaches them valuable lessons that could hardly be obtained by any other available means. It is a commonplace that we may learn more from our defeats than from our successes, and, that sternly taught in this hard school, we may go on doggedly persevering until victory ultimately crowns our efforts. Then, again, competitions afford the architect the most considerable of his very scanty opportunities for enjoying a modicum of the publicity that, in some form or other, is esssential to prosperity. The public exhibition of his designs gives him a chance of showing what he can do, and it also affords the critic an occasion for offering him advice that, while it is not always palatable, is sometimes very profitable. The competitor casts his bread upon the waters, and it may return to him after many days, if he watches for it with intelligent alertness. But for the open competition system many an architect who now enjoys prosperity and fame might be languishing in poverty and obscurity. It discovers talent and distributes work more equitably, and that in itself is surely almost a sufficient justification of a system that nevertheless seems to lend itself with peculiar facility to many vexatious abuses. Not the least of these is the faulty drafting of conditions, which are commonly more fussy than informative, and too often suggest the lame and impotent conclusions inherently characteristic of committees, whose united wisdom is necessarily less than that of its wisest units. The conditions should be invariably revised in consultation with an architect—preferably by the assessor—who, as a rule, would know better than to impose restrictions that by cramping the efforts of the competitors would stultify the competition. But even then, very much would depend on the assessor's personal equation — a consideration that raises a number of delicate points which need not here be discussed in detail, such, for instance, as the natural tendency of competitors to "play up" to the personality of an assessor of strong individuality and marked predilections. The whole subject should be threshed out by a special committee of the R.I.B.A. The system, having grown up at haphazard, has developed so many inconsistencies and inconveniences, and is consequently causing such widespread discontent, that the central body would be amply justified in taking it in hand with a view to rendering its operations less fortuitous and casual, and therefore more satisfactory and more equitable to all concerned; and by this time sufficient material has been accumulated out of which to mould and model a common form as a basis of practice and a policy in the conduct of competitions; so that if thereafter everything is not done decently and in order, it will at least not be for want of authoritative guidance.

Architectural Skyscrapers.

The architectural treatment of the skyscraper has been pluckily attempted in the design of the new Metropolitan Insurance building in New York. This building has a tower, which is surmounted by a kind of spire, while the rectangular severity of the general structure is greatly mitigated by the introduction of arcading, balconies, cornices, pediments, and round-headed windows. Whether these decorative effects really improve the appearance of the building, or whether, on the other hand, they detract from the expression of uncompromising utilitarianism that gives this type of structure its unique character and provides its sole excuse is a moot point. To decorate it is to hybridise it by depriving it of its distinctive austerity without rendering it exactly a thing of beauty. It would hardly be possible to say quite as confidently of the new type as was said of the older, "In it American life is expressed with all its vulgarity, all its nobility, all its soaring ambition, all its utilitarianism, and all its tremendous energy." The genuine New Yorker, it would appear, loves and cherishes the ugliness of this distinctively American type of building, even as the Englishman prides himself on the hideousness of his bull dog: the object of affection in each case being indigenous, frankly ugly, strong, and businesslike: any attempt to modify the type or mix the breed of either of these national institutions being, one may well suppose, keenly resented. In each case, again, it appears to be only the form that must not be interfered with. In colour and "markings" a good deal of freedom is allowed. Marble is lavishly used, both inside and out, for the adornment of New York's skyscrapers, some of which, moreover, are very sumptuously adorned inside with onyx and rich woods. The preparation of plans of a skyscraper that is some day to be built for the Equitable Life Insurance Company has cost about £50,000 in fees to architects, engineers, and draughtsmen. Of course such sordid considerations have not the remotest bearing on the energy and ingenuity with which every properly constituted American architect is prepared to vindicate and extol the skyscraper! But it seems to us that the advent of the architecturally treated skyscraper robs his arguments of some of their point and force, and will necessitate a corresponding revision of his system of apologetics. But, as a rather daring essay in æsthetics, the architectural skyscraper is decidedly interesting.

Canada's Message of Hope.

About the first definite indication of a revival of industry comes from Canada. The welcome news was good enough to warrant a cablegram; and this, dated, Regina, June 9th, states that reports coming from various parts of the province show that the agricultural prospects are excellent. "First the blade, and then the ear, and then the full corn in the ear." It is added that, with a splendid harvest in prospect, business houses are working briskly, and the general trade outlook is very promising. Moreover, and what is more directly to our purpose, the building trade is feeling the full impetus of the movement. The many building schemes that had been suspended or postponed through financial stringency during the past two years are now being rapidly constructed, and the present year is expected to establish a record in the building activity of the city. Several large building blocks and more than a hundred large residences are being erected. This is a good hearing. We have no wish to exaggerate its importance; but in anticipation of the very natural feeling that it would have been more satisfactory to chronicle a similar movement nearer home, it may be pointed out that since the long and grievous depression has been world-wide, any decided indication of relief in any direction is of hopeful augury, and to spread the good news is an excellent means of extending and facilitating the general movement. We therefore feel in duty bound to place on record Canada's message of hope, and would strongly urge all whom it may concern to make the most of it as a blessed change from the deluge of dismal prophecies—and prophecy of any kind is apt to be self-fulfilling—after the order of Jeremiah, whose inauspicious ascendency is surely nearing its close. The wave of prosperity has far to travel before it reaches these shores; but at least it has started on its way.

Selby Itself Again. Selby Abbey, it is pleasant to note, is being rapidly and reverently restored to the usefulness of which it was temporarily deprived by the ravages of fire. When Mr. Oldrid Scott went down from London to view the then still smoking ruins, it was supposed that the necessary work would occupy at least five years; but such excellent progress has been made that the re-opening will probably take place on the third anniversary of the fire—that is, on October 19th of the present year. The fire has been regarded by some optimists as "a blessing in disguise," since in setting about the work of restoration it was discovered that the foundations were no better than bitter experience of the work of mediæval builders would have led one to suspect. It was found that the tower mainly depended for support on the adjoining walls, and that, in the picturesque and not too rigorously technical language of a recent observer, "its legs, the great heavy Norman piers, were, in three cases out of the four, really dangling free of foundations; for the heaps of rotten wood in a quicksand which lay beneath these masses of masonry could certainly not be dignified with the title of foundations." What would have happened if the fourth "leg" also had suddenly "dangled free" would possibly have amounted to a worse calamity than the fire, for it might have involved loss of life as well as destruction of the building; and the lesson of the discovery should not be lost on the custodians of ancient buildings. Of course, the foundations of Selby are now being overhauled and underpinned, so as to effect a radical cure of its ill-considered and rather disreputable habit of dangling its legs. By the way, the inventor of this graphic description raises a rather nice point. In commending the new carving work that is being done in the interior, he adds this curiously conceived point of criticism: "Several corbels and capitals have been left in the rough, because they will be hidden by the new organ. In the old days the sculptor exerted his skill with just as much care in an out-of-the-way dark corner, where nobody was likely to see his work, as in the most conspicuous position. This, however, is a utilitarian age, and the rough-hewn corbels will remain to a future generation, in contrast to the beautiful work that has been achieved all about them, as a memorial of this age of inconsistencies." As some slight atonement for inability to perceive the nature of this particular inconsistency, we hasten to point out that the critic's chosen models of consistency, the mediæval builders, did his comparison an ill turn when they did the hidden part of their work—the foundations—so badly as to set those legs a-dangling; and we certainly think that it would be inconsistent with economy—and perhaps with commonsense—if an actor playing Othello were to black himself all over, or if the sculptor who is adorning Selby Abbey had elaborated the corbels that the organ will conceal. It may, therefore, be respectfully submitted that, with regard to this charge of inconsistency, the critic, unlike the tower of Selby Abbey, has not a leg to stand on; or that, like the tower, he is dangling his legs over a very questionable foundation.

Art and Parsimony. An almost incredible statement has been made—but so far as we are aware, it has not been contradicted—with respect to the Victoria Memorial in the Mall. It is to the effect that, owing to the enhanced price of marble, the quantity required would have had to be skimped if Mr. Thomas Brock, the sculptor, had not generously given a substantial portion of his own fee to make up the deficit. What is incredible is not Mr. Brock's generosity, but the parsimony and shortsightedness of the Government. It is further stated that it is doubtful how far the original plans for the memorial have survived the want of money. It is to be fervently hoped that this doubt has no foundation in fact, but is merely engendered of bitter experience in the past with similar undertakings—the Wellington Memorial in St. Paul's Cathedral being a conspicuous monument to the mean views with respect to art that have characterised us as a nation. If the Victoria Memorial is indeed in danger of falling short of the conceptions of its authors, surely it would be more effectual than humiliating to make a frank confession of the fact, and, if necessary, to make a public appeal for additional funds. If the prospect of losing a Dutch painting could move a single private person to pay the princely ransom of forty thousand pounds, surely an explicit statement with respect to shortage of funds would save us from the national disgrace of stinting the glory of a noble monument to a noble queen. There are already in existence enough monuments to the national niggardliness, without adding this as a crowning example. The spectacle of the richest of nations showing the poorest possible regard for art must make the Italians—who are almost at diametrical extremes in these respects—fairly stare and gasp.

The Prepotency of Gothic. In Mr. G. Gilbert Scott one would expect to find a valiant defender of the faith in Gothic. His lecture delivered to the Architectural Society of the University of Liverpool does not disappoint this anticipation. Mr. Scott admits, somewhat superfluously, the unfitness of Gothic for secular uses, but he claims for it an overwhelming superiority, as compared with Renaissance, in the "power to express true religious feeling," and he supports what he calls "the current feeling" that Gothic "undoubtedly possesses characteristics appertaining to the Christian religion that may not be claimed by the other style." So long as the field of vision is confined to Gothic and Renaissance, Mr. Scott's decision in favour of the former as the superior means of expressing religious feeling is not exactly a daring postulate. It is hardly more provocative of controversy than the statement that fire burns and ginger is hot i' the mouth. That the real rivalry is between Gothic and Byzantine, the general admiration of Westminster Cathedral bears eloquent testimony. Mr. Scott's unsympathetic reference to St. Paul's Cathedral and its "general irreligiously impressive atmosphere of imperial magnificence" was therefore rather beside the mark. That a fine Renaissance church appears as a product of the intellect while a fine Gothic church impresses as a product of emotion, is perhaps, as he seems to suggest, an absolute phenomenon of artistic perception; or it may be, as he seems disposed to deny, a mere matter of association of ideas. Absolute affinity is no doubt quite possible, and might account for the departure from the earlier Roman and Romanesque forms, beginning with the basilicæ; but is it not at least equally probable that we in England are, or have been, biassed in favour of Gothic because of its venerable and historical association with the introduction and progress of Christianity in these islands? If so, the preference is not instinctive and absolute, but accidental and casual. The style has become consecrated by its many and ancient associations, and this fact would be quite sufficient, apart from any assumption of inherent virtue or fitness, to account for its abiding and overwhelming popularity, upon which even the tremendous influence of the Renaissance, the unexampled opportunities and unrivalled energy and skill of Wren, could only act as a temporary check. Ecclesiastical Gothic hardly needed Mr. Scott's defence as against Renaissance; and if, as he suggests, it can be given a fresh impetus by means that are legitimate and logical, the eternal craving for something new will be easily satisfied on Gothic lines, and in that case the rivalry even of Byzantine need not be feared.

R.I.B.A.

THE INSTITUTE PREMISES.

A special general meeting, summoned by the Council under Clause 22 of the Charter and by-law 60, will be held to-day, Wednesday 23rd June, 1909, at eight o'clock p.m. precisely, for the following purpose:—

To consider a resolution authorising the Council to purchase on behalf of the Institute the leasehold interest in parts of Nos. 9 and 11, Conduit Street, and No. 23A Maddox Street, adjoining those at present occupied by the Institute, and to raise out of the funds of the Institute the moneys required for carrying out and completing the said purchase and making the necessary alterations to the premises and paying the costs of the purchase.

THE R.I.B.A. FORM OF CONTRACT.

The Council of the R.I.B.A. desire to call the attention of members to the following letter from the Secretary of the National Federation of Building Trades Employers of Great Britain and Ireland:—

31 and 32, Bedford Street, Strand,
April 28th, 1909.

To the Secretary R.I.B.A.,—

DEAR SIR,—I am desired by my Committee to invite the attention of your Council to what appears to be a growing practice of stating at the beginning of bills of quantities that the conditions of contract will be those agreed between the R.I.B.A. and the Builders' Institute, the while subsequent conditions are inserted in the quantities which vary the said agreed conditions of contract.

As those subsequent conditions are probably repeated in the specification there is danger that a confusion will arise which would make it extremely difficult to say what are the exact terms of the contract between the parties.

My Committee deprecates such a practice, and hopes your Council will agree with the view that it should be stopped, and will use influence accordingly wherever practicable.—Yours faithfully,

A. G. White, Secretary.

SCHOOL OF ENGINEERING, GIZA.

Vacancy for Assistant Lecturer in Architecture.

Applications are invited for the post of Assistant Lecturer in Architecture and Building Construction at the School of Engineering, Giza, Cairo. The salary offered is £E450 per annum; unfurnished bachelor quarters provided in the school. Extra month's salary paid after arrival in lieu of travelling expenses. The appointment is for a period of three years dating from 1st October, 1909. Applications in the first place to be made to the Secretary R.I.B.A., 9, Conduit Street, W.

Societies' Reports.

Birmingham Clerks of Works and Builders' Foremen's Association.

By the kindness of the architects (Messrs. Ashley and Newman, of Gray's Inn Square, London), and of the contractor, Mr. Thos. Rowbotham, a party of members of the Birmingham Clerks of Works and Builders' Foremen's Association visited the new Art Gallery and Council House extension now in course of erection for the City of Birmingham. The party were conducted over the works by the clerk of works, Mr. H. J. Bennett, and by Mr. Thomas Hayes, the general manager.

It was generally recognised that the system of ventilation is decidedly ingenious. One notices that there is an extensive use of reinforced concrete.

One of the most interesting features of the building in its present state is the glazed brickwork, which is an excellent specimen of that class of work. The Aberdeen granite work was also greatly admired.

Birmingham Architectural Association.

The concluding lecture of the winter series arranged by the Birmingham Architectural Association was delivered by the hon. secretary, Mr. G. Salway Nicol, A.R.I.B.A., his subject being "Rome and Paris: their Architectural Relations." Many of the drawings of famous buildings and architectural studies made by Mr. Nicol during his tour as Tite Prizeman of the R.I.B.A. were exhibited. The lecture was also illustrated by lantern slides, showing the influence of Early Roman buildings on the architects of Italy and France during the great revival of art. This Italian influence was very much assisted by the establishment of the Ecole des Beaux-Arts in Paris, and of the French Academy in Rome, in the reign of Louis XIV.; and, in England, by the work of Inigo Jones and Sir C. Wren.

Institution of Gas Engineers.

At the annual general meeting of the Institution of Gas Engineers, which was held last week at the Institution of Mechanical Engineers, under the presidency of Mr. Thomas Glover, the three medals offered annually were awarded by the Council—the London Gold Medal to Mr. H. W. Woodall, of Bournemouth, for his paper on "Continuous Carbonisation in Vertical Retorts"; the Institution Silver Medal to Mr. F. J. Bywater, of Birmingham, for his treatise on "Refractory Material"; and the Institution Bronze Medal to Mr. A. F. P. Hayman, of Berlin, for his contribution on "Recent Experience with the Dessau Vertical Retorts." In his presidential address Mr. Glover said that of the £10,000 required for the Livesey Memorial Fund £9,970 had been raised. The remedy for the smoke nuisance might be found through the enterprise of gas undertakings, which at the present time were providing the public with smokeless fuel equal to 7¾ million tons of coal a year. With better lights, inverted burners, and more artistic fittings, the days of gas-lighting were by no means over.

At a recent meeting of the Clive Memorial Committee it was unanimously decided to give to Mr. John Tweed the commission for the bronze statue of Lord Clive to be erected on the steps at the end of Charles Street, Whitehall, and the marble statue to be placed in the Victoria Memorial Hall at Calcutta. The sketch model for these statues has been submitted by Mr. Tweed to the King at Buckingham Palace. The new stairway at the end of Charles Street, overlooking St. James's Park, will be so adapted as to provide a pedestal and base for the statue.

An exhibition organised by the National Association for the Prevention of Tuberculosis, opened in the Art Gallery, Whitechapel, on June 3rd, by the Right Hon. John Burns, M.P., President of the Local Government Board, included several features of architectural interest. There were pictures of various sanatoria—Midhurst, Davos, etc.—and there were full-sized models, representing (a) a dark and dirty room, in such as which consumption is likely to be bred, and (b) the room as it ought to be—light, airy, and clean. The exhibition, which was free, remained open until June 19

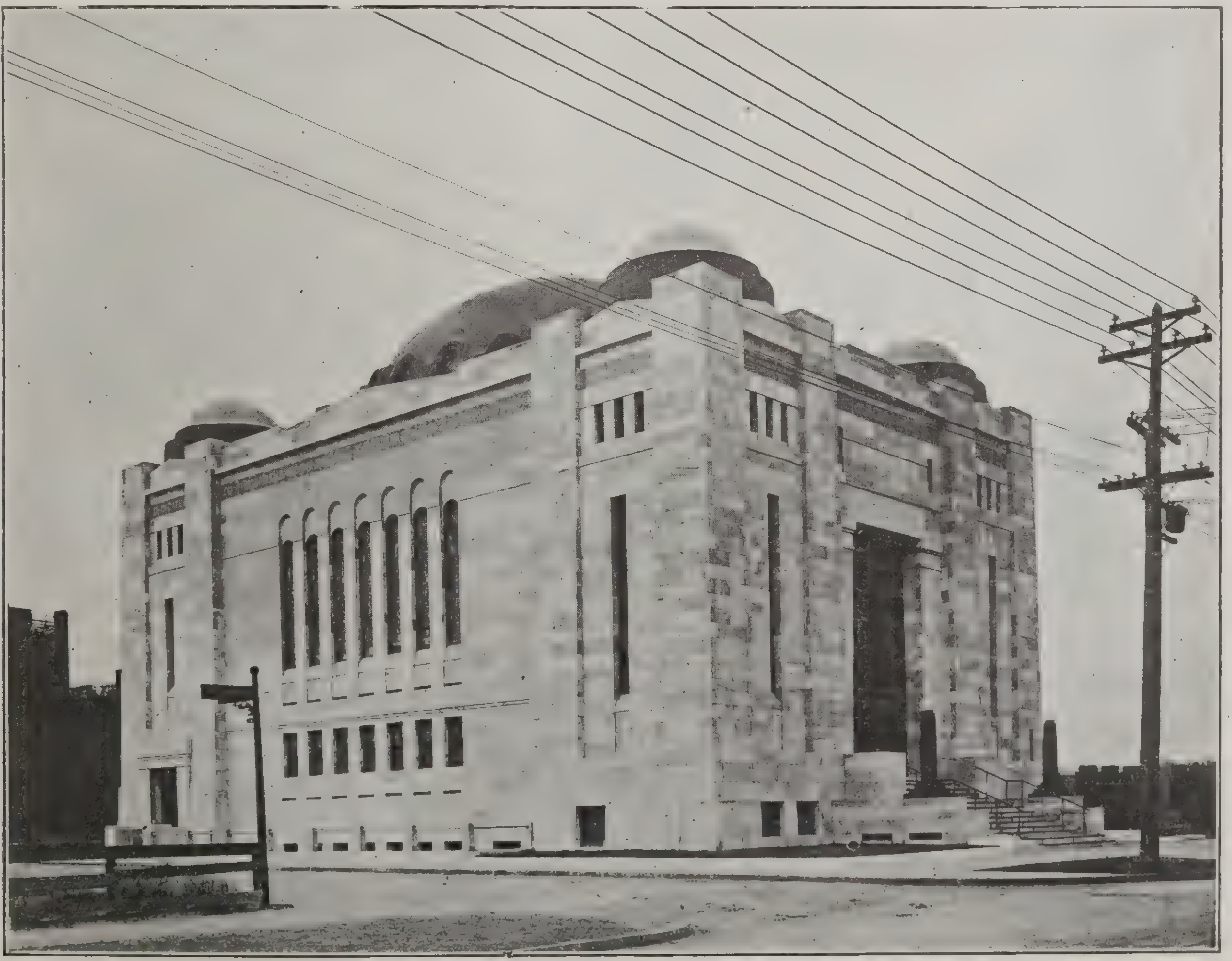


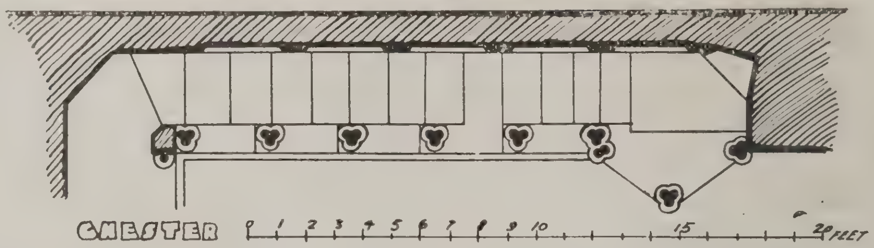
Photo: Topical.

NEW SYNAGOGUE AT BOSTON, MASSACHUSETTS, U.S.A.

This building is a very happy example of the monumental work that is being done in America in connection with buildings of even such moderate scale as that shown above. The building is also interesting constructionally by reason of the fact that the domed roof is constructed of reinforced concrete.

FOUR READERS' PULPITS.

By Edwin Gunn, F.R.I.B.A.



Plan of the reader's pulpit in the Refectory of the Benedictine Monastery of St. Werburgh, now part of Chester Cathedral. The entrance is in the east return wall at the angle of the Refectory, the stairs mounting steeply behind a stepped arcade of five arches in the south wall of the pulpit.

These refectory pulpits, which have survived among the monastic remains of England, well illustrate the flexibility of mediæval art, and form an interesting comparison; curiously, three are of thirteenth century date. In each case the scheme is generally similar, or would appear so if a merely verbal description were given, but considerable variety is apparent in the treatment.

A small doorway at floor level, leading to a narrow vaulted stairway in the thickness of the wall (the latter arcaded next the refectory and pierced with windows externally), is the means of approach, the pulpit being considerably elevated above the floor level.

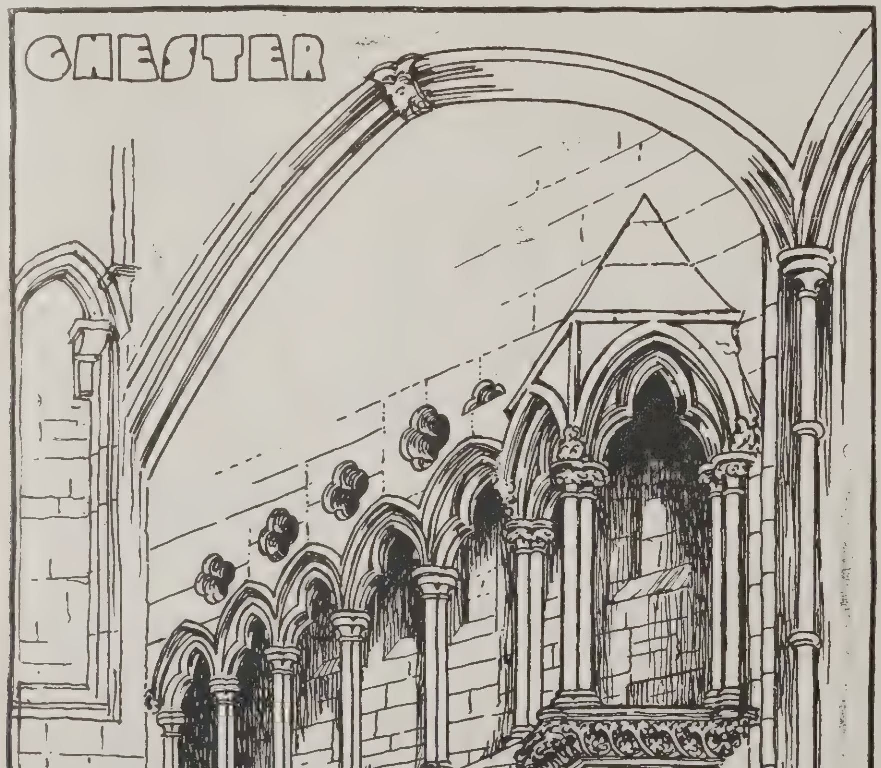
The example at Chester is the best preserved, and is in the south-east corner of the refectory of the Benedictine monastery, dedicated to St. Werburgh, of which the church is now Chester Cathedral. Complete measured drawings appeared in "Ancient Pulpits" by F. T. Dollman, and a sketch is in Prior's "Gothic Art in England." A plan and sketch are given below from which it will be seen that the entrance is in the east return wall at the angle of the refectory, while the stairs mount steeply behind a stepped arcade of five arches in the south wall, to the pulpit, which has a triangular corbel surmounted by a canopy in continuation of the wall arcade. As the refectory ranges in the Benedictine manner alongside the cloister walk, the rise is a steep one, in order, probably, that a window might be introduced above the cloister roof, to light the pulpit.

At Beaulieu, in the New Forest, the refectory of a former Cistercian Abbey (founded by King John in 1204) is now in use as the parish church. The pulpit is approached by a wall passage and very low pitched stair, the treads being 16ins. and the risers 6ins. This is rendered possible by the Cistercian custom of placing the refectory at right angles to the cloister, so that the long sides stood free of other buildings, and could be pierced for light, enabling the wall arcade in this case to run level for four bays, with a single rise by a stilted arch at the first of the two remaining bays.

The actual pulpit is a modern restoration, only the corbel with its conventional foliage carving, and the fine wall-arch and window being original. Most of the shafts in the wall arcade (one Purbeck marble) are also modern. The treatment is less rich than at Chester, and has all the Cistercian austerity in moulding and lancet arches. Complete measured drawings appeared in the A.A. Sketch Book, First Series, Vol. 5, and further illustrations in the Glasgow A.A. Sketch Book, Vol. 2.

Of the Premonstratensian Abbey of Tupholme, in Lincolnshire (founded in 1160 by Alan and Gilbert de Neville) a portion of the refectory wall is the sole remnant, and for the photograph of this I am indebted to Mr. Allen Foxley, B.A. It will be seen that the pulpit is somewhat earlier in date than either of the first-mentioned examples, the detail being of Transitional character, and it is altogether a less extensive affair. The rubble arches evidently indicate an undercroft, and the refectory floor level appears to be shown by the worked stone visible at the foot of the pulpit stair. The latter is therefore less elevated than either of the preceding examples, and perhaps for this reason does not project.

The scanty remains of another fine refectory pulpit on a very grand scale are at Rievaulx in Yorkshire, and a lovely example of fourteenth century date at Shrewsbury Abbey, Shropshire (also illustrated in Dollman's "Ancient Pulpits") now stands in a private garden. Fragments of the walls are attached, from which it appears that this pulpit, which is a complete octagon on plan, formed a sort of turret projecting as to three of its faces internally, and three externally (these latter glazed), while of the remaining two one was blank and the other the entrance, approached by a similar wall passage and stair to the other examples given.



This reader's pulpit is one of the best preserved examples in the country, and is in the south-eastern corner the Refectory of the Benedictine Monastery of St. Werburgh, of which the church now forms the Cathedral Church of Chester.

Mr. Wm. Collins, of Green Lane, West Vale, has been appointed Clerk of the Works on the New Elementary School Buildings, Elland.

* * *

At the Paris Salon this year two medals have been awarded to Englishmen—one to Mr. Edgar Bundy, R.I., in painting; the other to Mr. John W. Simpson, F.R.I.B.A., in architecture, for a drawing entitled "The Roedean School, Pensionnat de Jeunes Filles à Brighton."

* * *

The Honorary Committee of the Exhibition of Chosen Pictures at the Grafton Galleries have issued an invitation to the members of the R.I.B.A. to a special reception to view the exhibition on Wednesday, June 30th, from 3 to 6 o'clock. The members will be admitted without payment on signing their names in a book provided for the purpose.

* * *

Messrs. E. A. Roome and Co., builders, etc., of 36, Basinghall Street, E.C., have appointed Mr. F. J. Gayer as manager. The partnership hitherto existing between Mrs. G. A. Roome and Mr. J. E. Whiter having expired by effluxion of time, the business will be carried on by Mrs. Roome.

A PATENT SYSTEM OF EARTHQUAKE-RESISTING CONSTRUCTION.

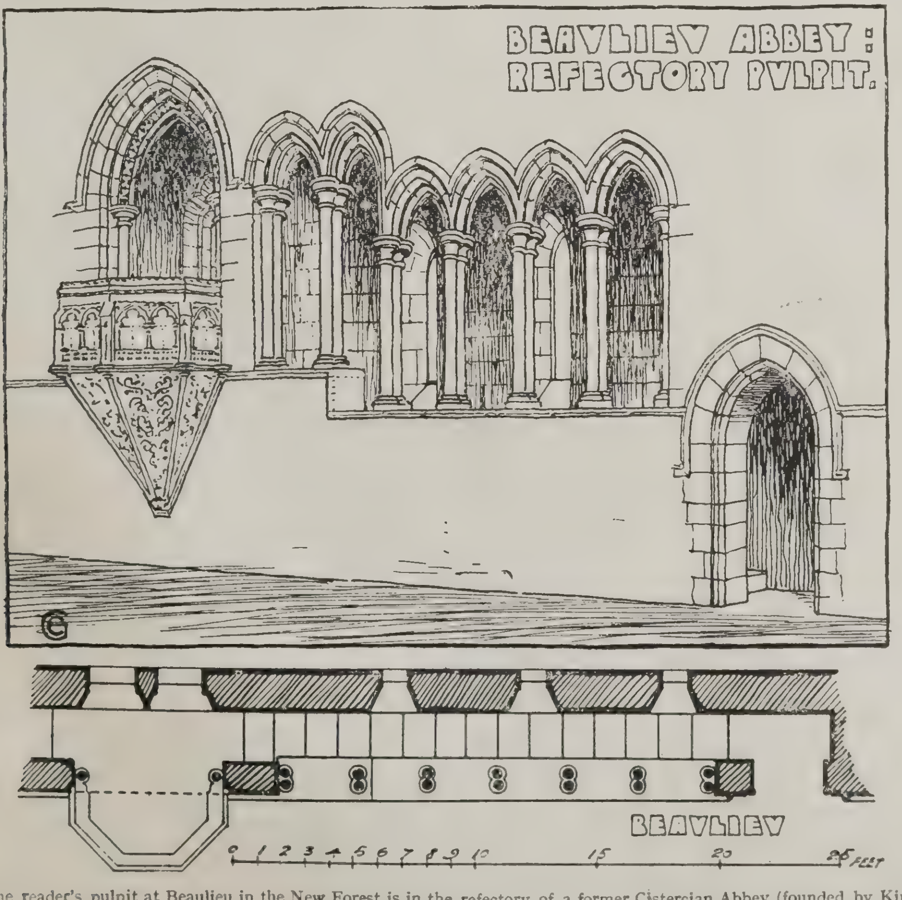
A system of earthquake-resisting construction of which the complete specification has just been issued, has for its fundamental principle the absence of binding material between the superstructure and the foundation. The foundation is built to the ground level or thereabouts in the usual manner, and the top of the foundation wall is faced with strong, solid material of a non-resilient character, with a perfectly smooth upper surface. On this are deposited layers of smooth material, such as plates of talc or mica, each layer being well dusted with powdered talc, mica, kaolin, soapstone, steatite etc.; or the plates of talc or mica may be dispensed with, and sand, or asbestos powder, or mats substituted. The physical properties necessary in the selection of substances for this purpose are that they should be imperishable; that they should not adhere together, or to the surfaces, nor cohere under the weight of the superstructure; and that under the influence of earthquake vibrations they should be capable of free interstitial or sliding movement by the attrition of their meeting surfaces or otherwise, and so act as a lubricant between the two surfaces. Upon the prepared zone or layer are deposited strong slabs of granite, stone, iron, or other suitable material of a non-resilient character, having a perfectly smooth under surface, and well bound together horizontally. The superstructure is laid upon this, and the building completed, care being taken that the upper line of slabs or plates is securely fastened or bound in such manner that the whole building above the non-resilient shock-absorbing zone is solidified, or forms practically a solid block; but there must be no binding together of the upper and lower line of blocks—that is to say, there must be of necessity a non-resilent free joint, or a non-resilient meeting of surfaces which will allow of unrestrained sliding movement under the impetus of earthquake shocks.

Under the influence of earthquake, the foundation of a building so constructed will obviously be subject to the tremors of the earth like any other, but these rapid vibrations will only cause a sliding movement of the smooth, slippery non-resilient plates or surfaces one upon the other; and the non-resilient shock-absorbing zone or layer being adequately thick, little if any motion will be communicated to the solid walls of the superstructure.

Photo: Allen Foxley.

TUPHOLME ABBEY, LINCOLNSHIRE. REFECTORY PULPIT.

This fragment of the refectory wall, showing the reader's pulpit, is the only portion remaining of the Premonstratensian Abbey. It is of earlier date than the previous examples, being a Transitional example. The refectory floor level is indicated by the rubble arches, there evidently being an undercroft or basement under it.

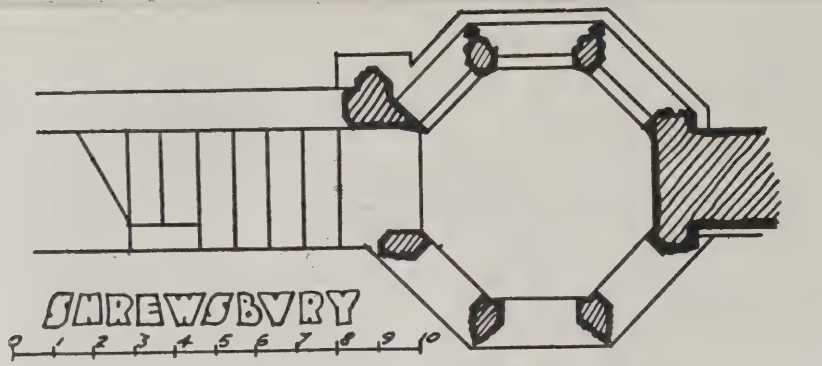

BEAVLIEV ABBEY: REFECTORY PVLPIT.
BEAVLIEV
0 1 2 3 4 5 6 7 8 9 10 15 20 25 FEET

The reader's pulpit at Beaulieu in the New Forest is in the refectory of a former Cistercian Abbey (founded by King John in 1204), and now in use as the Parish Church. The actual pulpit is a modern restoration, but the corbel and wall arch are original.

For securing the stability of columns, it will be necessary to use, in addition, bars, girders, or joists, so disposed in connection with the other elements as to form a lateral and vertically non-resilient strengthening device, which will be required for the foundation as well as for the superstructure.

The security of water and gas supplies against the effects of earthquake is also provided for by means of an arrangement of coils and spirals, the joints being secured in a firm and watertight manner, with thick bituminous sheeting, which allows of a slight movement at the joints without breaking the pipes. It is claimed that during an earthquake there will be no disturbance of the relative positions of parts, and therefore no fracture of the pipes can take place. The danger of fracture at the point of junction between the ground and superstructure is provided against by the use of flexible coil and other arrangements. The patent, No. 10254, 1908, was accepted on May 12th, 1909, and the patentee is Dr. J. A. Calantarients, of 8, Alma Square, Scarborough. It is claimed that the system would be equally efficient for resisting typhoons.

We regret to announce that Mr. Alfred Liebert, who held the position of manager to the Calmon Asbestos Slate Co. for a great many years, and was highly esteemed by all who came in contact with him, died on Tuesday, June 8th, after a very short illness.



REFECTORY PULPIT AT SHREWSBURY.

This fine example of 14th Century work stands in a private garden at Shrewsbury. Fragments of the walls are attached, from which it appears that the pulpit, which is a complete octagon, had three faces open to the interior, and three glazed to the exterior. The stair approach and a blank wall account for the other two sides.

Correspondence.

[*The Editor declines responsibility for the statements made by correspondents.*]

Efflorescence in Walls.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—With reference to the correspondence that has taken place in your columns, may I be allowed to point out that the chief cause of this appearance has been for years attributed to the iron pyrites present in some clays, converting the lime in the plaster covering the bricks into sulphates; and the better the outward appearance of the brick—the smooth and glossy surfaces referred to in your issue of June 2nd—the more likely are such bricks to contain these pyrites. The sulphur acids from ordinary house fires have a like effect on lime plaster, and it is doubtless for this reason that we frequently find dark efflorescence lines on plaster in the vicinity of glues.

I may mention, for the information of your readers, that I have had many cases of the kind, and my experience has always been that the only effectual cure is to cut out the lines down to the brickwork to a width of about half-an-inch—to damp well the rough chase so cut—to fill in with Keene's cement, and to paint the making-good with two coats of good oil colour.

The remedy may appear drastic, but I find it is the only effectual one—ordinary painting, damp-proof paper, or brown paper, being useless.

WALTER MARKHAM.

London, N.

Columbia Fir.

To the Editor of THE BUILDERS' JOURNAL.

SIR,—With reference to the reply to a correspondent on p. 484 of your issue for May 19th, allow me to state that the Society of Architects visited the Surrey Commercial Docks on June 11th, and among the objects of interest pointed out to them by Mr. Davies were several stacks of Columbia pine. This is stated to be botanically a "Douglas Fir," and occurs in large scantlings of very clean appearance. It is largely used by the War Department for tent poles, and appears to be well suited for roof trusses and other constructional work. It was understood to be rather tough under the plane, and more like pitch pine than Baltic fir.

HENRY ADAMS.

ARCHITECTURAL COPYRIGHT

The Council of the Royal Institute of Architects having been invited to give evidence to the House of Commons Committee appointed to examine and report upon changes proposed in the law of artistic copyright, with a view to its being brought into conformity with the revised Convention of Berne, which was signed at Berlin in November last, appointed Mr. John Belcher, R.A., past-president, and Mr. John W. Simpson, vice-president, to represent them. These gentlemen have gone into the matter with great thoroughness, and they were assisted by many members of the R.I.B.A., to whom a circular letter was addressed, inviting members who had had reason to complain of the unauthorised reproduction of their drawings, or of their executed work, whether as regards plan-arrangement, elevation, or otherwise, to communicate brief particulars. Expressions of opinion from the councils of allied societies were also invited; and in response to these requests much valuable and striking information has been forwarded, and the effect of this evidence is strengthened by the materials that Mr. Simpson has obtained from continental sources, by his deductions therefrom, and by his and Mr. Belcher's able and lucid statements of the case.

Mr. Simpson is strongly in favour of according to architectural work similar protection to that given to sculpture, and Mr. Belcher is entirely in agreement with him. The case for architectural copyright was summarised in our issue for May 26th, on p. 493, and is in substantial agreement with the representations of Messrs. Belcher and Simpson.

Mr. Belcher confirms the statement that the most notable representatives of the profession in every country have continually urged the need for protecting the work of architects in the same way as that of painters and sculptors. In his opinion, the art would advance more rapidly, and the public taste be further improved if all architectural works were protected, as he holds that the public taste is lowered by speculating builders and incompetent men who have copied and adapted in mutilated form the designs of architects. "The architect," he says, "who has devoted years to the study of his art, and who has given time and thought to the development and working out of his design, is at present unprotected. His designs can be reproduced, and his building caricatured. . . The facility with which copies of designs can be obtained," he argues, "is a temptation to the inexperienced man to adapt the designs of a more experienced architect. . . By such courses the public are deceived, and the mass of adapted reproductions of contemporary architectural designs becomes the standard of public taste, or represents to them the prevailing fashion which must be followed." Thus, he contends, not only is the advancement of architecture hindered, not only are the public imposed upon, but the architect is defrauded of his property so long as it is unprotected.

The Town Clerk of Leeds (Mr. R. E. Fox) has asked the Government for an explanation of the special clause in the Housing and Town Planning Bill relating to the erection of back-to-back tenement dwellings. The original clause forbade the further erection of back-to-back houses, but subsequently there has been added a proviso that the clause should not apply to back-to-back tenements if such were properly ventilated in accordance with the judgment of the medical officer. The Leeds authorities, however, are in doubt as to what is meant by "back-to-back tenements," and they require a clear definition of the phrase.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

DATE OF DELIVERY.	COMPETITION.
July 9	STOKE-UPON-TRENT. Additions to Town Hall including large hall to seat 3,000 people, police court, etc. Premiums of £100 and £50 for second and third designs respectively. Assessor nominated by Pres. R.I.B.A. Conditions and particulars from Jno. B. Ashwell, Town Clerk, Town Hall, Stoke-on-Trent,
July 17	NEW PUBLIC BUILDINGS, BURSLEM. The Architect whose design is placed first by the Assessor will be appointed to carry out the work. Premiums of £100 and £75 to authors of second and third designs, respectively. Conditions and plan of site from F. Bettany, Borough Surveyor. Deposit, £2 2s., returnable on receipt of *bona fide* design.
July 19	WHITLEY BAY PUBLIC ELEMENTARY SCHOOL for 600 scholars, for the County of Northumberland Education Committee. *Limited to Architects practising in the County and in the City and County of Newcastle-on-Tyne.* Particulars and plan of site from C. Williams, Secretary to the Education Committee, The Moothall, Newcastle-on-Tyne.
July 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
Sept. 1	BRANCH LIBRARY, NEW CROSS, for Deptford Borough Council. Limited to Architects practising in the City or the County of London. Assessor: J. S. Gibson, Vice Pres. R.I.B.A. Premiums, £52 10s., £26 5s., and £10 10s., for three selected designs, and will be awarded in accordance with the conditions contained in the instructions to competitors. Site plan and copy of instruction from Vivian Orchard, Town Hall, New Cross Road, S.E. Deposit £1 1s., refunded on receipt of *bona fide* design or if instructions are returned within 21 days.

Agricultural Hall, Leeds.

The Leeds Corporation are considering the erection of an Agricultural Hall. It has been decided to institute a competition among Leeds architects, and it has also been proposed to offer prizes of £50, £25, and £15. The site is in the North Street Recreation Ground.

Messrs. Arthur L. Gibson and Company, 19, 20, and 21, Tower Street, Upper St. Martin's Lane, London, W.C., announce that their new factory, Radnor Works, Strawberry Vale, Twickenham, is now in running order, and that in future all orders received for their Kinnear patent steel rolling shutters will be filled from that address. Their offices and warehouse will remain for the present at their old address, as given above.

MIDDLESBROUGH LIBRARY COMPETITION.

The following memorial has been sent to the President of the R.I.B.A.

"To the President R.I.B.A.

"Sir,—We beg to enclose herewith copy of memorial, which was sent to the secretary R.I.B.A. on the 2nd inst., and which has been signed by 111 out of a total of 193 of the competing architects in the above competition, and presented to the Middlesbrough Free Library Committee at their meeting on the 9th inst., together with copy of letter accompanying same. [Not here reproduced.]

"In addition to this memorial, several individual competitors wrote direct to the Council protesting against the award, and these were all submitted to the Assessor prior to the meeting.

"In reply thereto he is reported to have said that he saw nothing in the conditions which would have prevented any of the competitors sending in plans on the lines of the first and second premiated designs, and that the plans had been carried out in accordance with the general conditions, and the authors of the successful plans had complied with the spirit as well as the letter of the conditions, and that he failed to see why any reasonable objection could be taken to the award.

"Also in regard to the memorial, 'he considered the objections in architects' petition frivolous and vexatious, and regretted any body of architects could so act in a public matter.'

"The fact, however, that about 98 per cent. of the competitors rigidly followed the very stringent conditions proves, it is thought, that there was no doubt or ambiguity as to the meaning of the committee, and that 111 architects, a large percentage of whom are members of the Institute, have signed the petition, shows very clearly . . . that this action has been taken in anything but a frivolous or vexatious spirit.

"We have every reason to believe that many more architects would have signed the memorial, had the time to obtain the signatures not been limited to four days in order to present it to the Library Committee at the before-mentioned meeting, and had they had an opportunity of viewing the drawings.

"The accompanying schedule tabulates our grounds of dissatisfaction.

[In paragraphs 1 and 2, it is asserted that this schedule shows that the competitors who adhered to the conditions were at a disadvantage, and among the points presented for "serious consideration" are the following]:

"3. That in the interests of the profession generally, and of the competitors in particular, the reason the instructions were ignored by the assessor in making his award be made clear to the Institute.

"4 That the Institute hold an independent inquiry into the whole matter, and issue a definite statement.

"5. We, therefore, ask, on behalf of the large body of architects whom we represent, that you give the matter your careful and serious consideration, as it is felt that this matter must be carried through to a definite conclusion.

"Should you wish for a list of the architects who have signed the memorial, we shall be glad to send it you.

"We are, sir, yours faithfully,

HOSKINS AND BROWN, Court Chambers, Darlington.

KITCHING AND LEE, Houndgate Chambers, Darlington, and Middlesbrough.

W. H. BOURNE, Houndgate Chambers, Darlington."

"June, 1909."

IN DEFENCE OF OLD BATH.

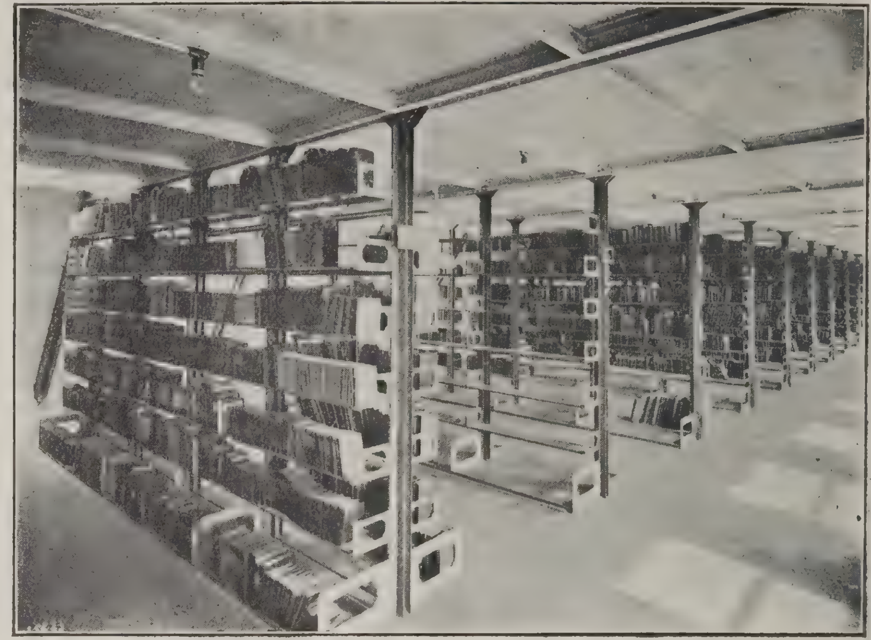
The Old-Bath Preservation Society have issued two pamphlets dealing with the Bath Street controversy. In the first are given a history of Bath Street, with views of the buildings that are in danger of destruction, a report of the meeting of protest, and the opinions of various architects and other art-lovers. Bath Street, one of Bath's most characteristic thoroughfares, was designed by Thomas Baldwin, city surveyor and architect from 1784 to 1792. An Act of 1789 enabled the corporation to make extensive street improvements, and Baldwin had the opportunity of superintending what was, for the period, a really considerable adventure in town planning. Bath Street, which was included in the scheme, was begun in 1791. Towards the end of February of the present year, it became known that the city council might pass a resolution that would involve the destruction of the north side of Bath Street, and a deputation, headed by the Rector of Bath (Prebendary S. A. Boyd), waited on the council to urge the claims of Bath Street as "a bit of old-fashioned Bath," and the desirability of maintaining it intact. The council, however, showed but little sympathy with the sentimental and æsthetic views, and entered into an agreement which would permit a firm of hotel proprietors to destroy the colonnade in order to erect a modern hotel. The general tone of the council was purely commercial, and it is doubtful whether they realised the significance of the protest. The second pamphlet is mainly occupied with a restatement of the case for preservation in answer to the council's manifesto in defence of the scheme. The pamphlets have been printed for Old-Bath Preservation Society at the offices of the "Bath Daily Chronicle," where presumably they may be obtained.

INSTRUCTIONS. (Issued to Architects.)	QUERIES. (Asked by Competing Architects,)	REPLIES. (Sent to Competing Architects by Town Clerk.)	SELECTED DESIGN.
1. The General Lending and Reference Libraries are to be placed in the Northern part of the block adjoining the dwelling-houses in Dunning Street (par 3, page 4).	100. Are the positions of Lending Library and News Room absolutely unalterable?	100. Yes.	Lending and Reference Libraries' separated about 37ft. from houses in Dunning Street, by Boys and Girls' Reading Rooms.
	106. Are the positions for the various rooms to be absolutely adhered to?	106. Paragraphs 3 and 4, page 4 of Instructions must be adhered to.	
	72. Must the Lending Library and News Room occupy the relative positions prescribed for them?	72. Yes.	
2. Secondary Entrance from Grange Road East (par 3).	75. Whether entirely distinct Entrances from the two Roads, Dunning Street and Grange Road East are desired for the Lending Library, &c., and News Room?	75. See 2nd and 3rd paragraphs on page 4 of the Instructions issued to Architects.	No Secondary Entrance in Grange Road, but one provided in Dunning Street.
	84. Should there be two Entrances from Grange Road, viz. :—One for the General News Room and one for Secondary Entrance to Lending and Reference Libraries?	84. Yes, but secondary Entrance not necessarily to Lending and Reference Libraries.	
3. Boys and Girls' Reading Rooms to be divided by glazed partitions, running from the Service Counter.			Two Counters and two partitions provided.
4. Juvenile Book Store to have steel gallery.	49. Would a gallery of sufficient width for one row of wall-cases be enough in the Juvenile Book Store?	49. Yes.	None provided.
5. Catalogue Room to be on ground floor.	53. May the Repairing Room be on first floor and separate from Receiving and Catalogue Room?	53. No.	Catalogue Room separate from Repairing and Receiving Room, and placed on first floor.
6. The General News Room to have Entrance from Grange Road East.	81. Must the direct communication asked for between Grange Road and Dunning Street be by means of Corridor, or would it be sufficient to have a door in the General News Room, communicating with the main Hall and Stairs?	81. No communication other than for Janitor between News Room and other parts of Building.	9ft. Corridor, shown with Swing-doors communicating between News Room and Main Building.
	80. Should there be access for the public between the General News Room and main Buildings without going outside the Buildings?	80. No.	
7. Patents Library and Extension Lavatory and W.C.s. for male and female staffs, corridors, &c., Area. 1,739 sq. ft.	92. What is meant by "Extension" in connection with the Patents Library?	92. A room for Library Extensions. when required.	Area provided about 850 sq. ft. No provision for Extension.
8. Furnace, Boiler and Coke Store to be on ground floor.	55. May the Repairing Room be in the Basement?	55. There is no basement, so must be on ground floor, as set forth in the Instructions.	Placed in Basement.
	61. May the Furnace Boiler and Coke Store be in the Basement, as there is no basement mentioned in Conditions?	61. No basement provided for.	Placed in Basement.
9. The General Reference Library should be entirely lighted from the roof direct; there must be no glass ceiling lights.	66. By the lighting of the General Reference Library from the roof direct, it is presumed that either skylights, a lantern light or dormer windows are suggested and that the prohibition of glass ceiling lights refers to false lights below a skylight?	66. Refers to false lights.	Side windows provided. Not lighted from roof direct at all.
	69. Lighting of Reference Library. Are skylights wanted and no side windows?	69. See Instructions.	

ECONOMICAL LIBRARY CONSTRUCTION.

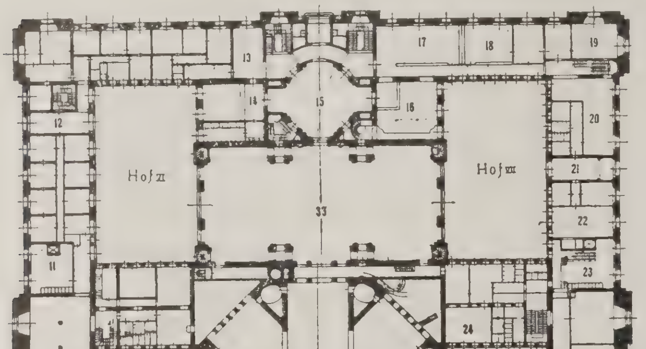
Libraries form no inconsiderable part of architectural practice in this country. The rise and growth of the public library movement has been remarkable, and the architectural profession observing the opportunities afforded by public competitions for such buildings have displayed much interest in the subject of library design. The practical purpose of such a building is of primary importance in the design of such buildings, and the architect has therefore to subordinate his artistry and systematic use of materials to the housing of the books and the planning of the public rooms. Such buildings have as a rule to be planned with strict economy, and it is of first importance to store the books they contain in as little space and as cheaply as possible, with due regard to ease of classification and access.

The design of bookshelves and bookcases has occupied considerable attention, and has received much consideration, and various solutions of the problem have been offered. There seems more and more tendency, especially in large libraries, in the direction of metal shelving, for by the use of metal not only is space cut down to the utmost limit, but the construction is non-flammable and fire-resisting. There are methods of constructing fixed metal shelving, for books

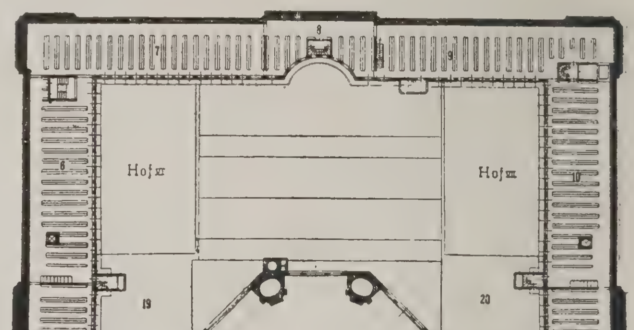


THE ROYAL LIBRARY, BERLIN. VIEW OF ONE OF THE UPPER FLOORS.

This view shows the ingenious method of shelving books mentioned in the article on this page. The shelves can be moved vertically up and down; or a whole shelf can be moved bodily to another fixture.



THE ROYAL LIBRARY BERLIN. GROUND FLOOR PLAN.



THE ROYAL LIBRARY BERLIN. THIRD FLOOR PLAN.

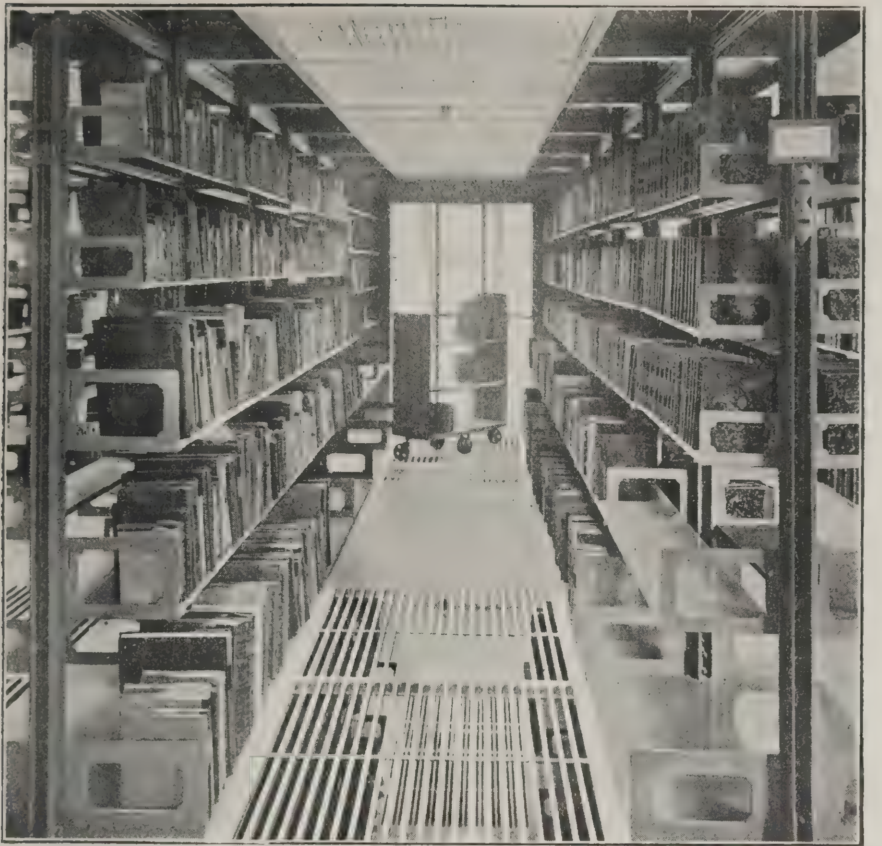
REFERENCE TO ROOMS ON GROUND-FLOOR PLAN.

1. Entrance for officials and business purposes; 2. Approach to the business rooms; 3. Cloak-rooms for officials; 4. Bookbinding department; 5. Temporary shelves; 6. Main catalogues and enquiries office; 7. Firemen and police; 8. Surgeon; 9. Passage leading to yard II.; 10. Book exchange; 11. Elevator room west; 12. Passage leading to yard VI., surrounded by officials' quarters; 13. Refreshment room; 14. Cloak-room; 15. Entrance hall; 16. Lending-room; 17—18. Catalogues; 19. Management; 20. Approach; 21. Passage leading to yard VII.; 22. Bookbinding department; 23. Elevator room east; 24. Professors' room; 25. Reserved for Institutes; 26. Entrance to yard III., official quarters adjoining; 27. Refreshment room; 28. Cloak-room; 29. Main entrance; 30. Landing-room; 31. Export and packing room; 32. Book store and rails for book trollies; 33. Reading room.

REFERENCE TO ROOMS ON THIRD-FLOOR PLAN.

1. Photographic studio; 2. Speech-room, with cloak-room, etc.; 3. Separate book shelves; 4—7.* Book stores; 8—9.* Book stores; 10—12.* Book stores; 13—15. Rooms for future storage; 14—16. Stores and special shelves; 17. Study for scientists (handwriting department); 18. Part of card collection department; 19—20. Rooms for future storage; 21. Air and ventilating space of the large reading-room.

The rooms marked * are already being used during the building operations.

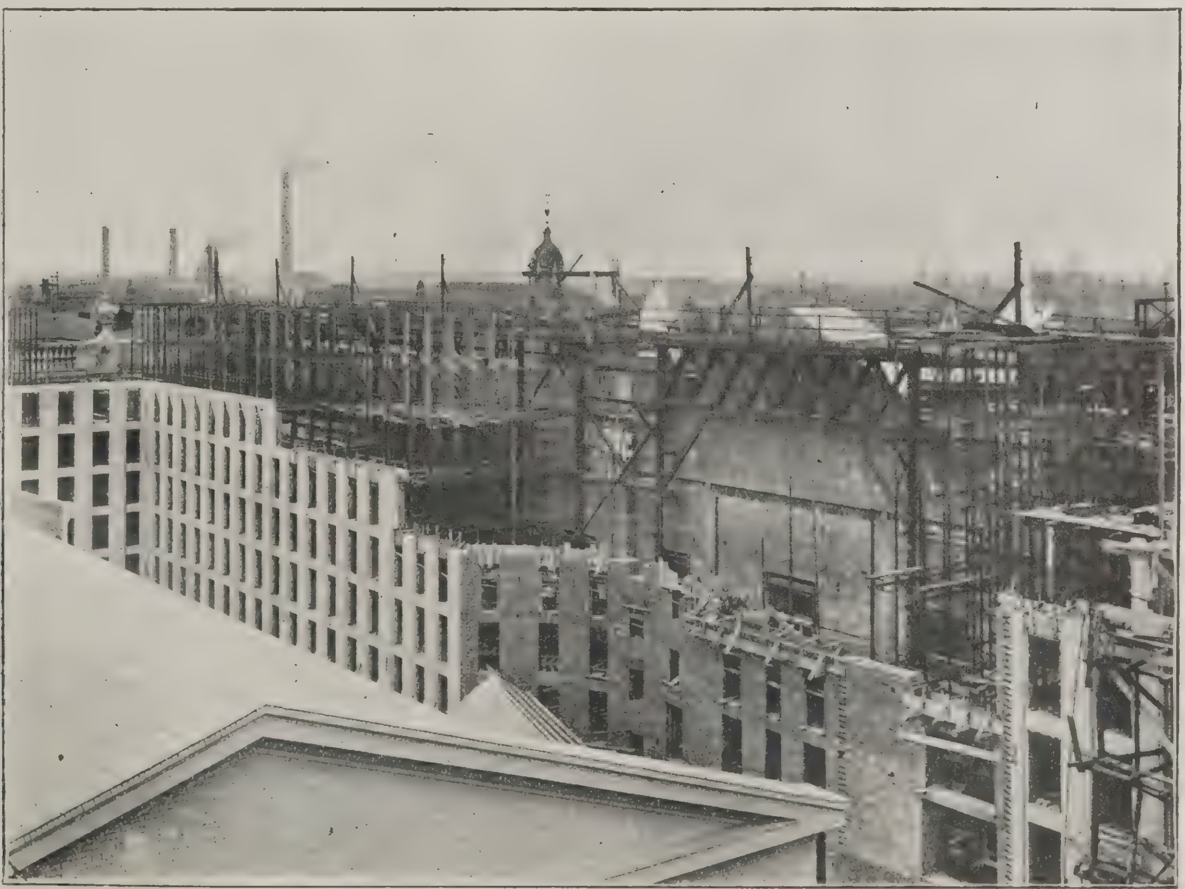


THE ROYAL LIBRARY, BERLIN. VIEW IN ONE OF THE STOCK ROOMS.

This is a view looking down one of the stack bays. One of the particular advantages of the system of storage adopted here is the elimination of heavy girders, floors, walls, and stanchions, thus allowing the maximum amount of space for storage.

that vary in detail, but fixed shelving is often inconvenient and wasteful of space. Libraries are continually growing, with need for continual re-arrangement. If the shelves can be shifted up and down, space can be saved, the small books being only allowed just sufficient space for them.

A system of library construction has been perfected in Germany that offers many advantages, and saves a very great amount of space. It has been employed throughout the new building of the Berlin Royal Library, which includes the libraries of the University and the Academy of Science, and is the largest library in the world. This building we illustrate by several views in this article. The plans of the principal floors are interesting as regards plan, but the construction of the actual library shelving is even more so. We give some views whereby it can be seen how the shelves are arranged stack upon stack, and the remarkable thing is that the whole interior is practically one mass of books from top to bottom. The floors are extremely thin, only a few inches in thickness, and the books enter right close up to each other without the space occupied by the floor even being lost between, for the floors only exist between the book stacks, and do not extend under them. The bookstacks are supported independently of the walls on a steel skeleton or frame construction. The stanchions are, however, much reduced in size, and even made to serve as the racks on which the shelves are arranged and supported. The saving of space is indeed wonderful, and by the adoption of this shelving in place of the ordinary style, practically another large library has been added to the building. The Berlin Royal Library is erected on a rectangular site, 558ft. long by 348ft. wide, and is 13 storeys high, and can accommodate about 5,000,000 volumes. The construction consists of steel racking with a sort of saw-tooth edge thereon. This racking is riveted to a steel plate, and the whole serves as a stanchion. If the construction is several floors high, the stanchions are strengthened by hav-



THE ROYAL LIBRARY, BERLIN, NOW APPROACHING COMPLETION.

This building is fitted with an ingenious system of shelving, and by this construction the maximum of space is obtained for book storage. In the illustration the steelwork for this can be seen in course of construction.

ing channels riveted thereto. Also each floor is braced by corrugated struts horizontally connected to the stanchions, and these carry the flooring, which may be made of portable slabs of wood, concrete, etc., or of metal gratings. The shelves are of wood or metal, and held by runners of sheet metal formed in a very ingenious manner. These latter have projections which fit into the teeth of the rackings before mentioned, and can be adjusted at any height in a second or two. The view shows the general arrangement, and the remarkable saving of space is clearly visible.

The saving of cost at the Berlin Library by the adoption of this system has been very considerable. The whole of this construction has been carried out by the Adjustable Shelving and Metal Construction Co., Ltd., who have opened a London office at Gwydir Chambers, 104, High Holborn, W.C. The firm has carried out other large libraries in similar construction all over the world, and it also has systems of fixed metal shelving (built of corrugated plates which afford great strength and rigidity), cupboards, cabinets and similar constructions. There seems a great future for this patent system of shelving in this and other countries. It is logical and ingenious, and is economical both in first cost and of space.

Buildings in Progress and Completed.

LONDON.—The new Institute of Physiology at University College, erected on the site of University College School, was opened on Friday last. The new building, which has cost £20,000, was designed by Professor F. M. Simpson, F.R.I.B.A. It has three floors, and consists practically of six large rooms, each about 62ft. by 41ft., which are divided into smaller rooms by means of Mack partitions. Thus at any future time it will be possible at small expense to entirely re-arrange the rooms on any floor according to requirements. The main entrance on the ground floor is approached by a double flight of steps from the playground. The ground floor is devoted entirely to physiological chemistry. To the right of the entrance is a large students' laboratory about 62ft. by 40ft. It contains 96 working places, and there is a small balcony at one end for open-air work. The east side of the ground floor is devoted to laboratories for research in physiological chemistry. On the first floor experimental physiology is mainly to be carried on. The theatre has seating accommodation for about 200 students. On the west side of this floor the series of rooms are known as the "Thomas Webb Research Laboratories." to commemorate the legacy of £5,000 by Mr. Thomas Webb to the college for the purpose of research. The second floor is devoted to the departments of histology and of neurology, and to the aseptic departments. The whole of the west wing of this floor is taken up with a large students' class-room for histology and experimental physiology. There is a demonstration theatre in the south wing. The rest of the rooms on this floor are devoted to research.

The Chapel of the Queen Alexandra Military Hospital, Millbank, will be opened by the King to-morrow (Thursday). The Queen and Princess Victoria will accompany His Majesty. The new chapel is a plain red-brick building in the classical style, with apse-shaped chancel. It will afford accommodation for 150 worshippers, besides the choristers. It is lighted by four long windows on each side and by three stained-glass windows above the altar. The cost of the chapel, the east windows, and the other two tablets has been borne by anonymous donors. The communion-table, sacramental plate, reading desk, credence table, and harmonium were presented in 1905 by Sister Georgina Mary, of Clewer. The altar frontal is the gift of the matron (Miss E. M. McCarthy), sisters and staff nurses of the hospital. The kneelers at the altar rails were worked entirely by some of the patients. The Army Council gave the site of the chapel and the services of the Clerk of Works (Mr. E. Peers), and also sanctioned the offer of the Director of Barrack Construction (Mr. Hy. B. Measures, F.R.I.B.A.) to act as honorary architect. The contractors are Messrs. J. and M. Patrick, of Wandsworth; the windows, memorial tablets, and fresco have been designed by Messrs. James Powell and Sons, Whitefriars Glassworks; and the furniture and fittings have been supplied by Messrs. Whippell and Co., of Duncannon Street. The chapel is connected with the main building by an inclined corridor, along which it will be possible to wheel patients upon their couches.

Hengler's Circus, Argyle Street, is being converted into a variety theatre for the London Theatres of Varieties, Ltd., of which Mr. Walter Gibbons is the controlling manager. The building when completed will hold 4,000 people, and will be called the "Palladeum." Mr. Frank Matcham is the architect.

A new chapel is being added to the Church of St. Michael and All Angels, Bedford Park, at a cost of £1,300. Mr. Maurice B. Adams, F.R.I.B.A., is the architect.

MANCHESTER.—The large additional block of buildings now being erected for the Refuge Assurance Company, in Oxford Street, is steadily progressing. Mr. Paul Waterhouse, M.A., F.R.I.B.A., of London, is the architect, his father, Mr. Alfred Waterhouse, R.A., having designed the existing block. The facade of the new building is in dark red terra-cotta in harmony with the existing building, and the interior facings are of white glazed brick relieved with glazed bricks in green, red, brown and green-grey. Floors and staircases are of fire-resisting construction. A central tower introduced to hold the new and old parts together will be 220ft. high. Messrs. W. Brown and Sons are the contractors for the superstructure, and Messrs. Normanton for the foundations and basement. Mr. W. Robson is the clerk of the works.

UPPER TWICKENHAM.—The Church of All Saints' has been opened. The new building, erected from the designs of Messrs. Greenaway and Newberry, of 21, Queen Anne's Gate, S.W., is 95ft. long and 30ft. wide, and has been arranged with a view to its use as a parish hall when the permanent church has been built.

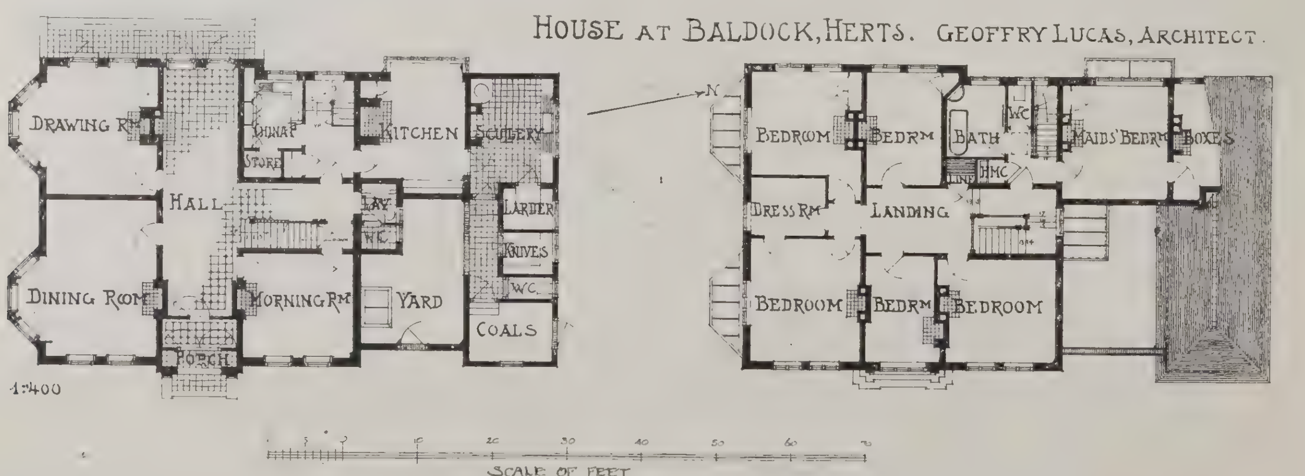
WALLASEY.—The Cheshire County Education Committee has accepted the tender of Mr. Huxley, of Malpas, at £15,430, for the erection of the secondary school here.

WEST LINTON.—A new public school, for 200 children, has been erected at a cost of £5,000. Mr. A. R. Scott, of Peebles, was the architect.

Our Plate.

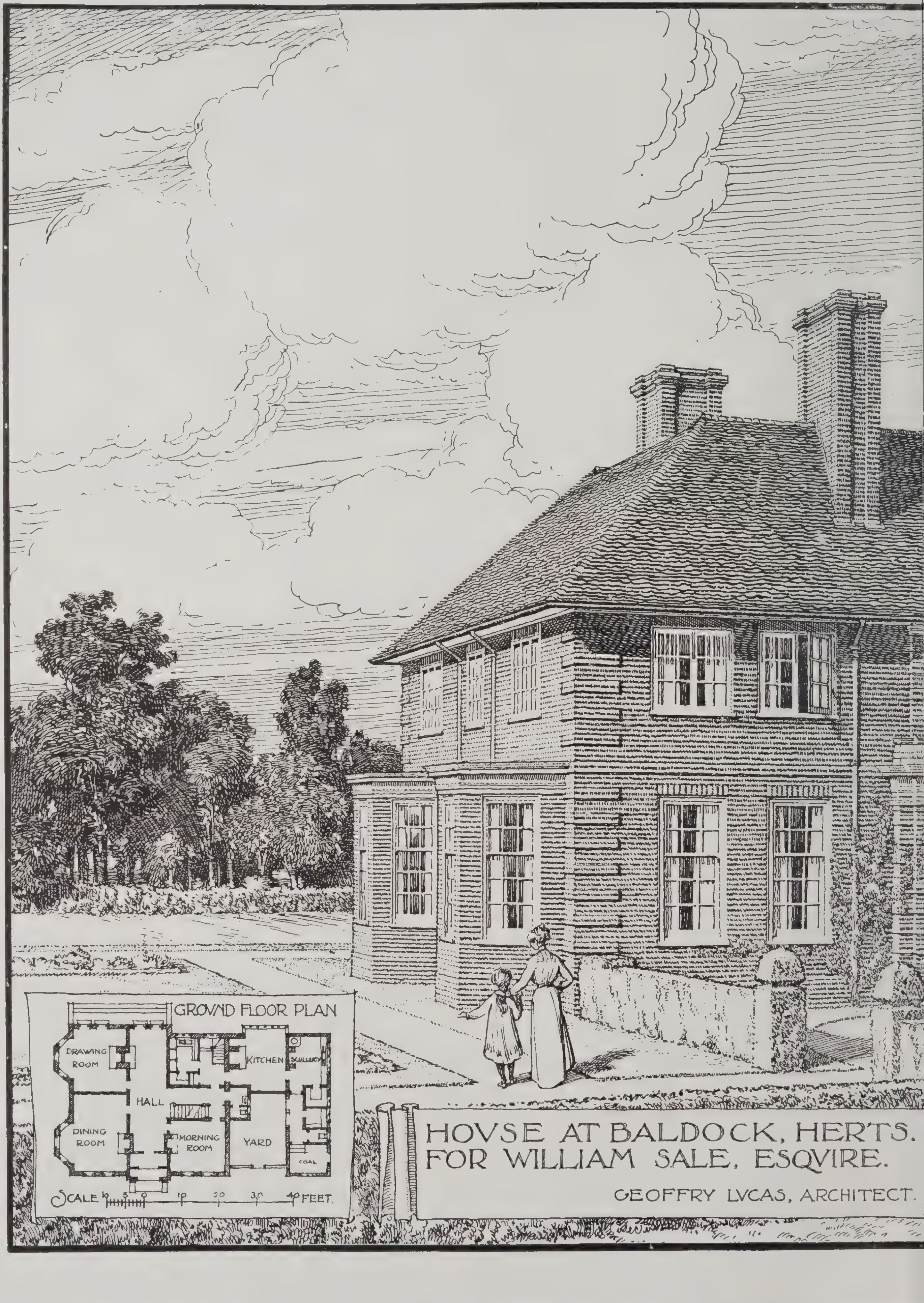
House at Baldock, Hertfordshire.

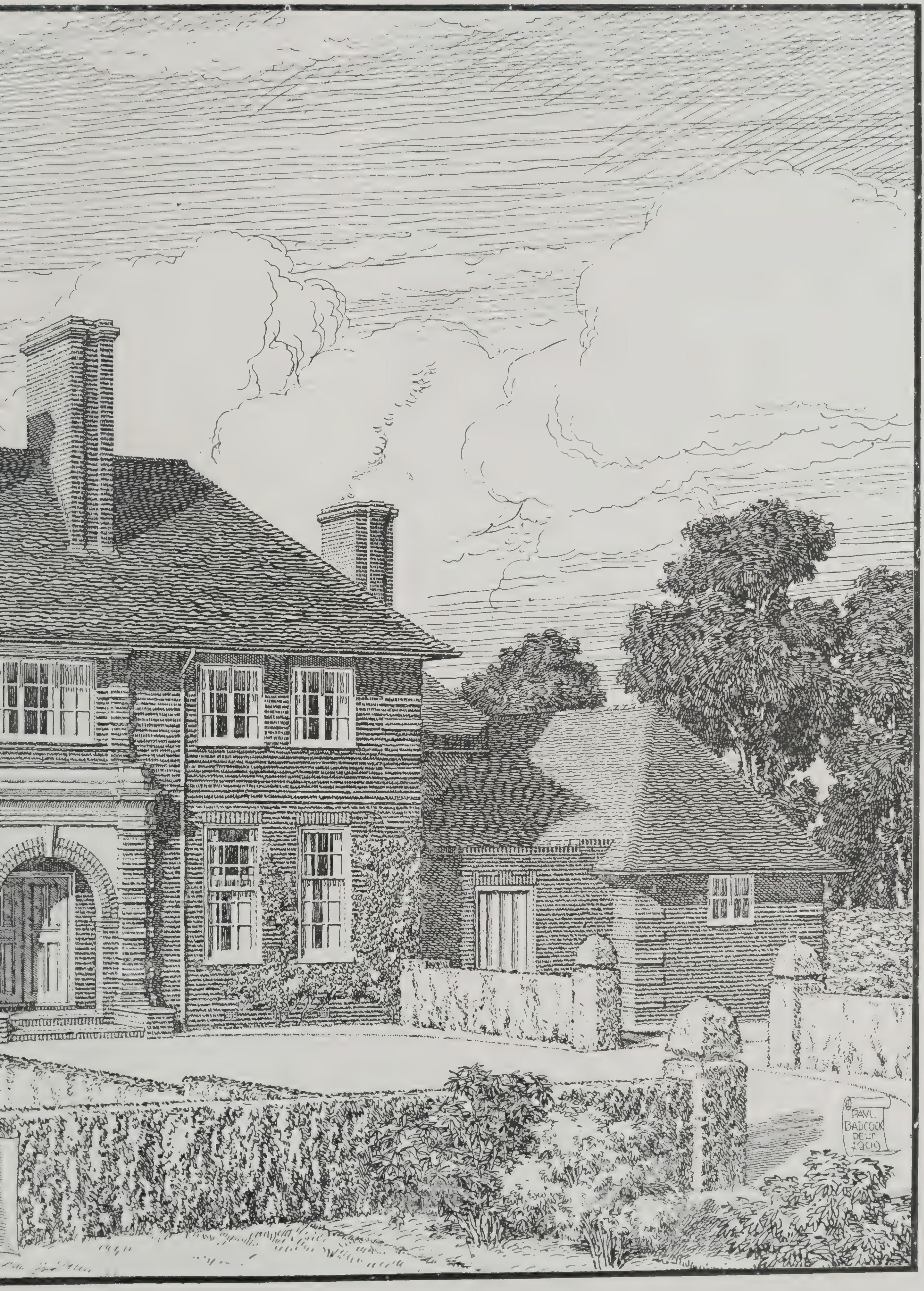
This house has just been completed at Baldock for Mr. William Sale. The ground floor has a large hall (running right through the house), drawing-room, dining-room, morning-room, principal and servants' staircases, china pantry, kitchen, scullery, cellar, and offices arranged round an enclosed yard. On the first floor are six bedrooms, dressing-room, and bathroom, box-lofts, etc. The materials are unpicked red bricks, from Ransom's brickfield at Hitchin, with the joints raked out with an oak slip, giving a very good effect. The roof is covered with hand-made red tiles, the woodwork is painted white, and there are whitened cement cornices to the bay windows and entrance porch. There are modelled cement spandrels to the porch, and lunettes over the doors and windows of the garden side of the house, which are whitened over, and were supplied by Mr. G. H. Cox, of Leicester. Heaped fires are used throughout, supplied by Messrs. Bratt, Colbran and Co., of Mortimer Street, W.; the kitcheners being supplied by Messrs. F. Edwards and Son, of Great Marlborough Street, W. Messrs. N. F. Ramsey and Co., of Victaria Street, Westminster, supplied all the ironmongery, and Messrs. Bolding and Son, of Davies Street, W., the sanitary goods. On the south front of the house there is a wall sundial made to the architect's design, which was arranged and made by Messrs. F. Barker and Son, of Sundial House, Clerkenwell Road, E.C., and the hall is paved with black and white marble paving supplied by the Art Pavements Co., Ltd., 7, Emerald Street, W.C. The general contractors were Messrs. T. Raban and Sons, Baldock, Herts, and the architect was Mr. Geoffry Lucas, A.R.I.B.A., of 14, Hart Street, W.C., and Hitchin, Herts.



This house, of which a view is given on our centre plate, is faced with local unpicked red bricks, with the joints raked out with an oak slip, giving a very good effect. The roof is covered with hand-made red tiles, the woodwork is painted white, and there are whitened cement cornices to the bay windows and entrance porch.

OF THE
UNIVERSITY OF ILLINOIS


GROVND FLOOR PLAN
DRAWING ROOM
KITCHEN
SCULLERY
HALL
DINING ROOM
MORNING ROOM
YARD
COAL
SCALE 10 5 0 10 20 30 40 FEET.
HOVSE AT BALDOCK, HERTS.
FOR WILLIAM SALE, ESQVIRE.
GEOFFRY LVCAS, ARCHITECT.


PAVL BADCOCK DELT 1909

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

THE NATIONAL GALLERY ADDITIONS.

By H. Colin Allen.

The accompanying photographs, taken by the writer just before Whitsun, show the main features of interest of the work of the roof to the additions to the National Gallery. In Fig. 4 is seen the long ventilating gallery in the roof over the largest of the new rooms. Eighty-five feet in length, and made up of walls 4ins. in thickness, it is carried on two 5in. by 12in. reinforced beams, one on each side in the direction of its length.

These beams, in their turn, are supported by twelve elliptical ribs, 14ins. thick at their springing by 5ft. deep, and diminishing to 12ins. thickness and 4ft. 6ins. in depth. (In the centre of the ribs, these dimensions alter to 11ins. and 3ft.) The height of the top of this gallery is about 50ft. above the floor.

There are three similar but smaller ventilating galleries, respectively 35ft., 35ft. and 28ft. in length, with similar ribs (Figs. 1 and 3).

The dome is of 32ft. span, and its underside is 60ft. above the floor (Figs. 2 and 3).

Supported on four reinforced beams, 1ft. 1in. by 3ft. 3ins., are eight smaller beams, 8ins. by 1ft. 9ins. (forming an octahedral figure on plan), from which spring the hips supporting the turret and forming the roof. These hips are reduced from 12ins. in thickness to 8ins., where the circular ring, the underpart of the turret, is met. This concrete ring is 8ins. in thickness and 3ft. 3ins. in height, with 1ft. 9ins. as its internal diameter.

Above this ring just described is an octagonal cill, 8ins. by 8ins., on which are mullions of the same thickness and 1ft. 9ins. in height, supporting a head 8ins. thick. Above this is a 4-in. cover.

Bolts have been left in the concrete to enable grounds for fibrous plaster and blind fittings to be fixed. Also rebates have been left, steps made on the drum, and gutters formed.

The centering to the longest roof is especially noteworthy for its economical construction. To a certain degree, its efficiency depended on the skilful manner in which it was erected.

The whole of the ferro-concrete work (Kahn reinforcement) has been done by Messrs. Wm. Moss and Sons, of Meadway, Hampstead Garden Suburb, N.W., and Loughborough, whose foreman-in-charge is Mr. T. O. Vine.

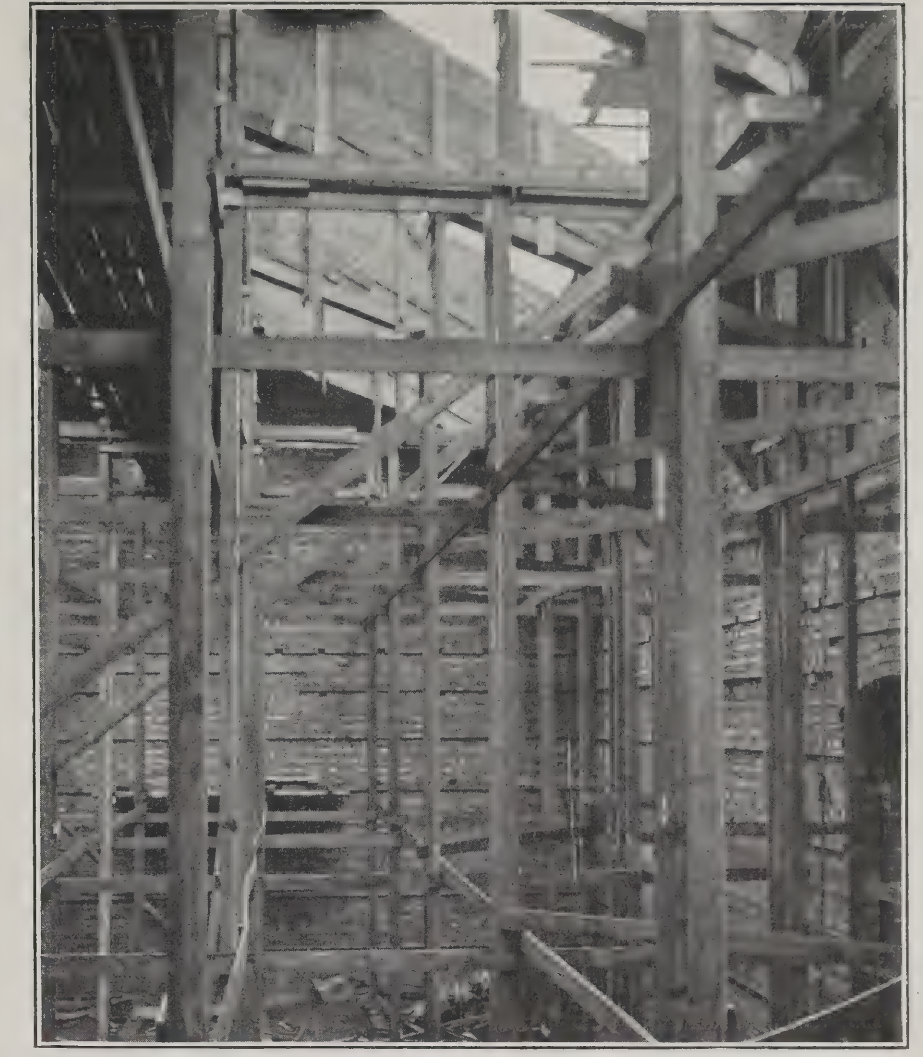


FIG. 1.—ADDITIONS TO THE NATIONAL GALLERY, LONDON.
This is a view of the new main gallery; through the archway on the right is another smaller gallery.

It is satisfactory to learn that the Office of Works will have the roof of the present buildings of the National Gallery rendered fireproof also, as was at one time suggested, and orders for the galleries to be closed a few at a time, so that the works may be carried out, have been circulated.

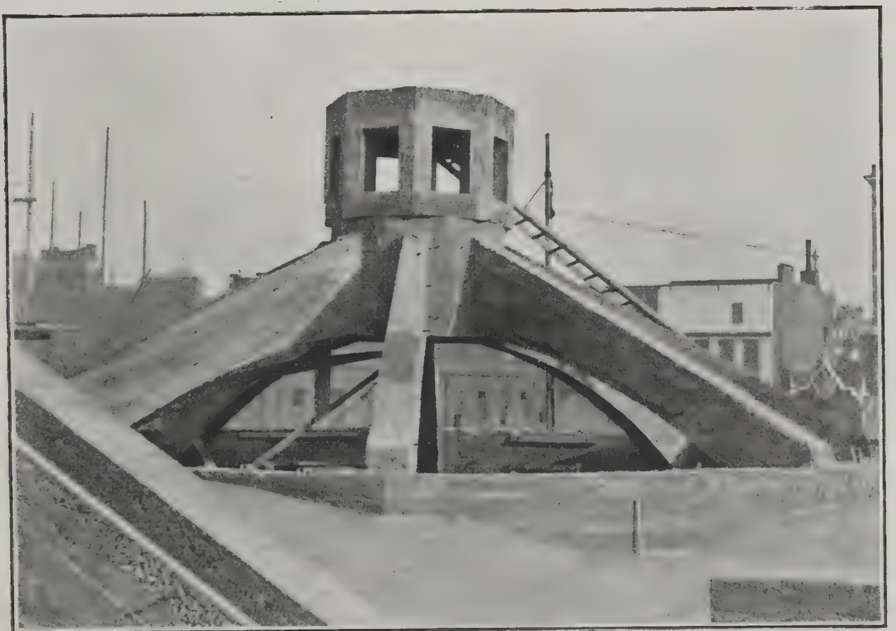


FIG. 2.—ADDITIONS TO THE NATIONAL GALLERY, LONDON.
This is a view of the reinforced concrete dome roof. The dome has a span of 32 feet, and its underside is 60 feet from the floor.

Proposed New Buildings.

BANFF.—A new higher grade school is to be built here to accommodate 200 pupils at as near a cost of £3,500 as possible. Mr. Clyne has prepared the plans.

BELFAST.—The Corporation have received sanction from the L.G. Board to a loan of £75,000, for additional buildings at Purdysburn Asylum.

BURY, LANCS.—The Bury Guardians have decided on an extension of the workhouse to provide 150 beds at a cost of about £7,000.

GLASGOW.—The following plans have been approved:—Additional ward accommodation at Western Infirmary of Glasgow. Four tenements of dwelling houses, Westmuir Street, for Messrs. G. and W. O. Dunsdale, of 11, Dalmarnock Road. Portion of new buildings in John Street, for Glasgow and West of Scotland Technical College. Tenements at junction of London Road and Dalmarnock Road for Mr. E. A. Tait, Verona, Nithsdale Road, Pollokshields. New buildings for the Savings Bank of Glasgow, 101-107, New City Road, and 12-16, Shamrock Street. Reinstatement, after fire, of premises, 50, Kelvinhaugh Street, for Hutson and Sons, Ltd. Five self-contained dwellings at Dinmont Road, Shaylands, for Mr. G. Eadie, 406, Mathieson Street. Three tenements and shops, Great Western Road, for Mr. J. Anderson and another, 27, St. Vincent Street. Five tenements, corner of York Drive and New Street, forming a continuation of Lauderdale Gardens, for Mr. R. A. McCowat, of 8, Brisbane Street.

GLASGOW.—Approval has been given to the following building proposals:—The Alexandra Park Property Company, 65, Bath

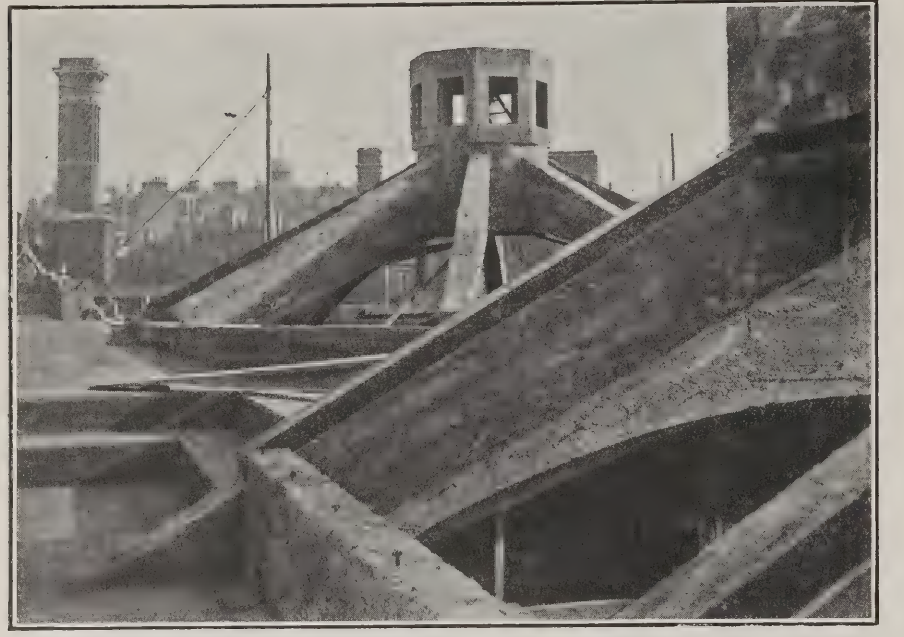


Photo: H. Colin Allen.

FIG. 3. ADDITIONS TO THE NATIONAL GALLERY, LONDON.

Another view of the octagonal dome, showing in the foreground part of the roof of one of the smaller ventilating galleries.

Street, seven tenements of dwelling houses on the east side of Aberfeldy Street, off Cumbernauld Road. William Hollins and Co. (Limited), Boden Street, new dining-rooms in Boden Street. John Smellie, builder, South Street, Whiteinch, eight self-contained lodgings on the south side of Redlands Road, Kelvinside. John Marshall and Sons, builders, Bishopbriggs, two semi-detached villas on the west side of the public road leading from Glasgow to Kirkintilloch. Rev. William F. Knox, M.A., 31, St. Andrew's Drive, Pollokshields, and others, trustees of St. Mark's Episcopal Church, a church and temporary hall in West Scotland Street. Edward Macbean and Co. (Ltd.), 23, Howard Street, buildings in Mary Street, Port-Dundas. James Smith Gray, 74, Osborne Street, warehouse and stores as an extension of the existing buildings at the west corner of Osborne Street and New Wynd. George Eadie, builder, 405, Mathieson Street, three tenements of dwelling-houses on the north side of Kirkcaldy Road, Maxwell Park. Brownlie and Murray (Limited), engineers, Possil Ironworks, Possilpark, alterations and extensions to existing buildings at 64, Denmark Street, Possilpark. The Scottish Automobile Club, 163, West George Street, per Sir J. H. A. Macdonald, K.C.B., and others, alterations and additions to subjects at 11, Blyswood Square. Heinrich Lindeman, 104, West George Street, and others, trustees for the German Evangelical Congregation, a church at 202, Renfrew Street.

HULL.—L.G. Board enquiries have been held into applications by the Town Council to borrow £9,500 for widening and improving Southcoates Lane; and to borrow £5,020 for the purchase of land in Mill Lane and near Perth Street, for the purpose of small holdings and allotments.

Plans for the following have been passed: Garden Village, Ltd., 123 houses, Garden Village; E. W. Waudby, 13 houses, Westcott Street; J. B. McMaster, 6 houses, Cottingham Road; W. Garbutt, 12 houses and shop, new street, Marfleet; W. Garbutt, 20 houses, new street, Marflett; F. W. Lewis, 77 houses, new street, Stepney Lane; J. Kirby, house and stable, Stepney Lane; R. Robinson, 2 houses, Hymers Avenue; Mrs. P. Smith, 12 houses, Brindley Street; G. T. Spruit, 28 houses, Westcott Street; Norman and Cooper, 12 houses, Telford Street; W. Burkes, house and shop, 59, Hessle Road; H. Vokes, 7 houses, Plane Street; A. Bond, 12 houses, new street, Marfleet; A. Botham, 35 houses, Buckingham Street and Derwent Street; F. West, 9 houses, Richmond Street; Garden Village, Ltd., house, Garden Village; E. Singleton, houses, Heathcote Street; J. T. Taylor, 7 houses, Southcoates Avenue and Whitworth Street; A. N. Whincop, 3 houses, Hessle Road; Corporation of the Trinity House, alterations, 33, Posterngate; F. Atkin and Co., Ltd., extensions, Dairycoates; Moors' and Robson's, Ltd., Maltklin, Marlborough Terrace; Marton's, Ltd., alterations, Grand Theatre.

INVERNESS.—The District Asylum Board is considering the advisability of building a sanatorium in connection with the asylum.

LIVERPOOL.—A scheme is on foot for erecting a hall in Liverpool for performances by amateur dramatic, literary, and other societies, and suitable also for concerts, lectures, and recitals. It is thought that the hall will cost about £14,000.

LITHERLAND.—A new church, to be erected out of the sum of £10,000, generously given by Miss Willox in memory of her brothers, is to be erected here in that part of the parish of St. Philip, locally known as "Klondyke."

LEEDS.—The City Council are to purchase 2,700 sq. yds. of land adjoining Armley Park at 7s. a yard, as a site for the proposed special school for mentally defective children.

LONDON.—The Marylebone Borough Council propose to erect new depot buildings, stables, etc., in Grove Road, St. John's Wood, at a cost of £14,214. Application is to be made for a loan, subject to the sanction of the L.C.C.

MANCHESTER.—A L.G. Board enquiry has been held into the application of the Corporation to borrow £5,300 for a new branch library at the corner of Cheetham Hill Road and Kitchen Bank, Crumpsall.

NAPSBURY.—It is proposed to erect additional buildings at the Middlesex County Asylum to accommodate 582 persons. The cost is estimated at £65,475.

NOTTINGHAM. — The Notts Standing Joint Committee have decided to reinstate the Shire Hall after the fire, and add to it—at an estimated cost of £4,000.

PORT GLASGOW. — Messrs. George Arthur and Son, architects, Airdrie, have submitted plans for the reconstruction of the first section of the bay area, and these are now under the consideration of the Town Council.

PRESTON.—The Town Council has decided to erect a new grammar school at Moor Park.

SLEAFORD.—Buildings, estimated to cost £10,000, are projected for a beet sugar factory.

SMETHWICK.—A L.G. Board enquiry has been held respecting an application by the Council to borrow £10,000 for the erection of a depot in Rolfe Street.

SWANSEA.—Mr. G. T. Hine, F.R.I.B.A., has furnished estimates for a fully equipped asylum on a site at Cefn Coed. For an asylum of 800 patients complete his estimate is £184,000, land £16,060, and equipment, at £20 a bed, £16,000—total £216,000. For an asylum with an administrative department for 800 but accommodation for 600 patients, the total is £189,160. For an asylum with an administrative department for 600 and patients' quarters for 400, the total estimated cost is £144,060.

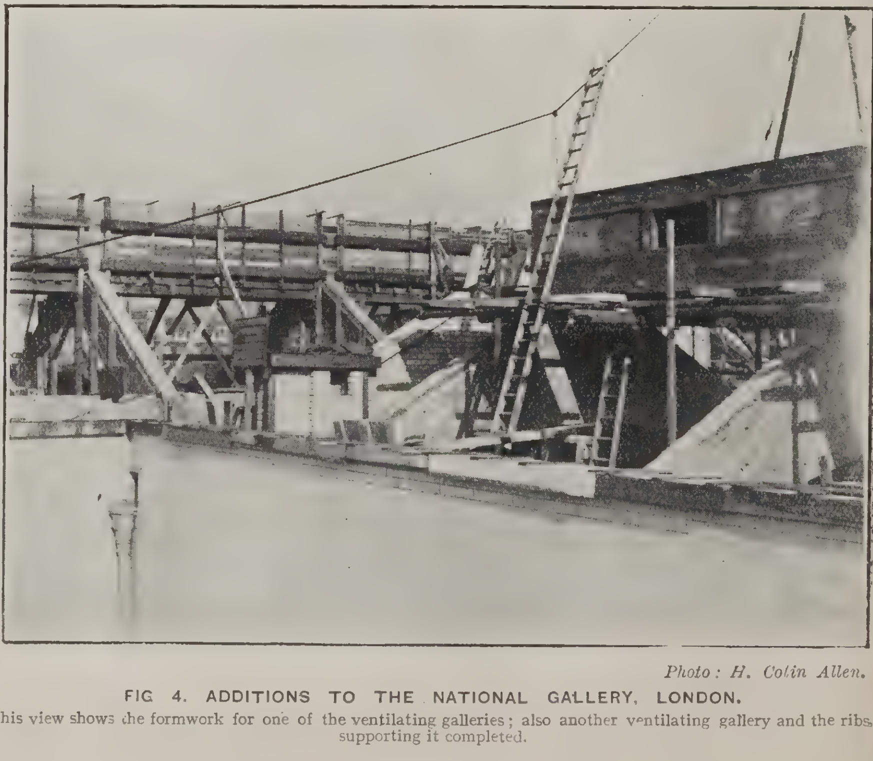


Photo: H. Colin Allen.

FIG 4. ADDITIONS TO THE NATIONAL GALLERY, LONDON.

This view shows the formwork for one of the ventilating galleries; also another ventilating gallery and the ribs supporting it completed.

CONCRETE AND STEEL SECTION.

(MONTHLY.)

Is Reinforced Concrete Economical? Reinforced concrete possesses many advantages—one of which, namely, resistance to shocks, we refer to below, and these advantages would compel its adoption even if its cost were greater than that of other methods of construction. But those advantages, such as fire-resistance, monolithic character, resilience, ductility, resistance to shock, damping of vibration, equability of temperature, durability, resistance to weather, adaptability and pliability, etc., have hardly been sufficiently emphasized, and are not generally clearly realised by the architectural and engineering professions. The chief advocates of reinforced concrete have referred to its economy as compared with other current methods of construction. The economy may be small in certain circumstances, and may not be very apparent at first sight, as it depends on a number of factors; whereas usually first cost is thought to be everything, and the first cost of a reinforced concrete structure may sometimes be relatively high. Efficiency ought to be considered in assessing economy. Rather too much emphasis has been laid upon cheapness—reinforced concrete is not always cheap. An architect listening to that cry sometimes thinks he will test it on his next job. When that job comes along to the specialist, it is found to be really either quite unsuitable for reinforced concrete, or perhaps can be cheaper, though not so efficiently or so economically done in that material as by ordinary steel or brickwork construction. A price and design are, however, submitted in the hope of getting the order, but the architect, finding it higher than what the ordinary method would cost, immediately assumes that reinforced concrete as a whole is dearer than earlier methods of construction, and dismisses it from his mind for future work. That is to be regretted. We can only say to such people that though reinforced concrete is acclaimed by some advocates as superior for every purpose, there are some things which it will not do. However, though it may not in all peculiar circumstances be cheaper in first cost, and may be unsuitable in certain circumstances, it possesses much intrinsic merit, and in the majority of cases affords economy and efficiency, and possesses certain indubitable advantages that cannot justly be claimed for any other material or method of building.

Construction and Commonsense. Commonsense in structural design is a requisite of which many designers really are in great need. We suppose that the deficiency arises from a too theoretical training, as a rule, but a good deal of it is attributable to the teachers and writers of text-books being men with very little practical experience, and untrained to employ scientific ways of thought—analysis and synthesis. The most impracticable proposals are put forward by eminent professional men—even by supposed experts. Often professional schemes are nipped in the bud by hard-headed business men, and there are great resultant heart-burnings, and the clients are called interfering and pettifogging ignoramuses, unable to appreciate the wonderful originality and cleverness of the architect or engineer. But really we have seen some most ludicrous examples of misapplied energy and want of commonsense. Too much knowledge is almost as dangerous to some men as too little, because then the designer goes on theorizing and forgets just to look at the problem in an elementary way, when he might see that he had omitted to consider a factor that entirely upsets his calculations. Many common errors are due to want of acquaintance with materials. Often professional men are confirmed book-worms, and when they go on a job they see nothing but what they have been taught to look for, and see only the surface of things. If they only tried to do things for themselves, looked closely into the actual operations, and studied the materials, tested their assumptions, and stopped on jobs for several days at a time seeing all the operations performed, perhaps we should not hear of so many vexatious mistakes. Yet it is surprising how much can be done by men with the most rudimentary theoretical attainments, provided they have had a little experience and exercise a little commonsense. In fact, we have no hesitation in saying that it is the latter which makes the eminent architect or engineer. There are many men who possess great ability in theoretical investigation, but who rank far below men who work by rule of thumb, with really little ability beyond commonsense. It should be the main endeavour of educationists to instil commonsense into the heads of students—that is far more important than any amount of theory or dry facts. Students chiefly require to be able to think clearly and logically.

Earthquakes and Reinforcement. The earthquake in the South of France has again served to call public attention to the importance of considering the design and construction of buildings with respect to resistance to earthquake shock. It has now been abundantly proved by the earthquakes at Messina and San Francisco that reinforced concrete is the only form of construction which seems to satisfy all the needs of buildings in such districts. Several ingenious theories and methods of design have been suggested, but example seems to show that a raft foundation is practically all that is needed in respect to the preservation of the building. It seems to us too much to hope that a solution can be found which will preserve the contents of a building against harm from vibration and shock. For instance, a building on a raft foundation may be secure in itself, but it may rock about so that the contents may be shaken up and down, and articles bumped against each other, so as to damage or shatter them. The theorists are chiefly concerned with the reduction of such damage rather than with the stability of the structure, for that problem may be regarded as solved.

The Financial Standpoint. Edwin C. Eckel, one of the best-known experts on the cement industry of the United States, the author of "Cements, Limes, and Plasters," the standard work on these materials, and, until recently, in charge of the cement work on the U.S. Geological Survey, has written a book entitled, "The Portland Cement Industry from a Financial Standpoint" (35, Nassau Street, New York; 2 dols.). As Mr. Eckel states in the preface, his book will have served its purpose if it aids either banker or investor to differentiate between securities offered against successful existing plants or sound projects, with reasonable prospects of success, and those issued against foolishly planned or recklessly promoted propositions. Mr. Eckel's book differs from any previous publication on the cement industry in that it devotes itself chiefly to the financial side of the subject. In fact, it is the first authoritative presentation of the financial side of the industry. Matters of purely technical importance are for this reason subordinated to the questions of financial methods and profits. Such subjects as raw materials and manufacturing processes are discussed, therefore, only as they have a distinct bearing on financial results. The opening chapters contain a brief discussion of the processes and raw materials on which cement manufacture is based, with very complete statistics covering the past history and production of Portland cement. The following chapters discuss the probable future trend of the U.S. cement industry, particular attention being paid to price-history.

A Guide to the Foreman and Clerk of Works. This ("Reinforced Concrete Field Handbook" by the Editors of "Concrete Engineering," Cleveland, U.S.A.; The Technical Publishing Co. Price $1), is a very useful little pocket book. It deals with the practical side of reinforced concrete construction, and it contains a great deal of information on the subject. It is just the thing for the foreman and clerk of works who have to deal with reinforced concrete, and it can be read with advantage by the designer of structures erected on that system. The book contains information about cement, sand, aggregates, steel, centreing, steel fabrication and placing in position, manufacture of concrete, and, finally organisation and field notes.

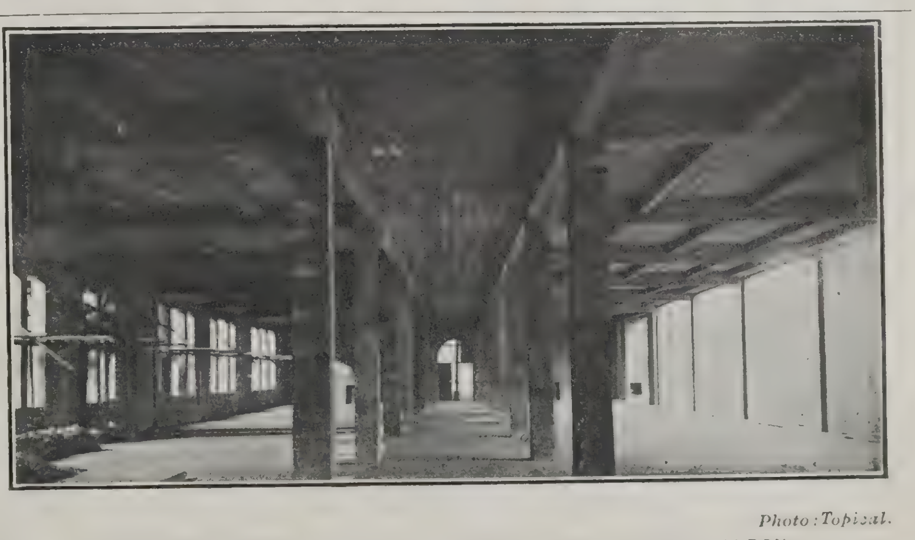


Photo: Topical.

THE KING EDWARD BUILDING, GENERAL POST OFFICE, LONDON.

This is a view of one of the floors in the sorting office block, which is over 300 feet long. The building is constructed entirely of ferro-concrete, and is a striking illustration of the lightness of construction obtainable by the use of reinforced concrete.

THE NEW "KING EDWARD BUILDING" OF THE G.P.O.

This building, of which five illustrations are here shown, consists of two blocks, namely, the public-office block, 210ft. by 54ft. by 80ft. high, and the sorting-office block, 312ft. by 212ft. by 75ft. high. Between them is a loading yard 200ft. by 60ft. The site, it will be remembered, is that on which formerly stood Christ's Hospital ("the Blue-coat School"). Adjoining it is a church; and in digging the 28ft.-deep trenches, the builders had therefore to provide against enormous pressure. A retaining wall of the old-fashioned type would have had to be 10ft. thick at the base; but Messrs. Holloway Brothers put up a ferro-concrete one, of which the general thickness was only 8ins., but it was stiffened with ribs 8ins. wide. Trenches 60ft. wide were dug round three sides of the basement. The construction of the beams is thus described: They are formed of "(1) horizontal rods near the floor level, (2) parallel horizontal rods over the crown of (3) a steel arch, whose ends project through the supporting columns and are embedded in the next beam, (4) a steel truss between the two systems of horizontal rods above referred to, (5) a series of vertical steel stirrups uniting the various members." There are fifteen acres of flooring in the building; yet, in floors, walls, and stanchions, only 20,000 cubic yards of concrete, and about 3,000 tons of steel have been used. With the wall thicknesses required under the old system of building, the floor-space would have been 50,000 superficial feet less than it will be now that the use of ferro-concrete has enabled the adoption of much thinner walls. Advantage is taken of the great tensile strength of ferro-concrete to form the cantilevers shown in the illustration. In the loading yard, it was desirable to form a recess into which the carts could be backed. Columns would have been obstructive, and therefore cantilever beams were adopted as shown. The architect is Sir Henry Tanner, F.R.I.B.A., I.S.O., Chief Architect to the Office of Works; the contractors are Messrs. Holloway Brothers (London), Ltd.; and Mr. T. A. Watson, Messrs. Holloway's engineer, has had charge of the work throughout.

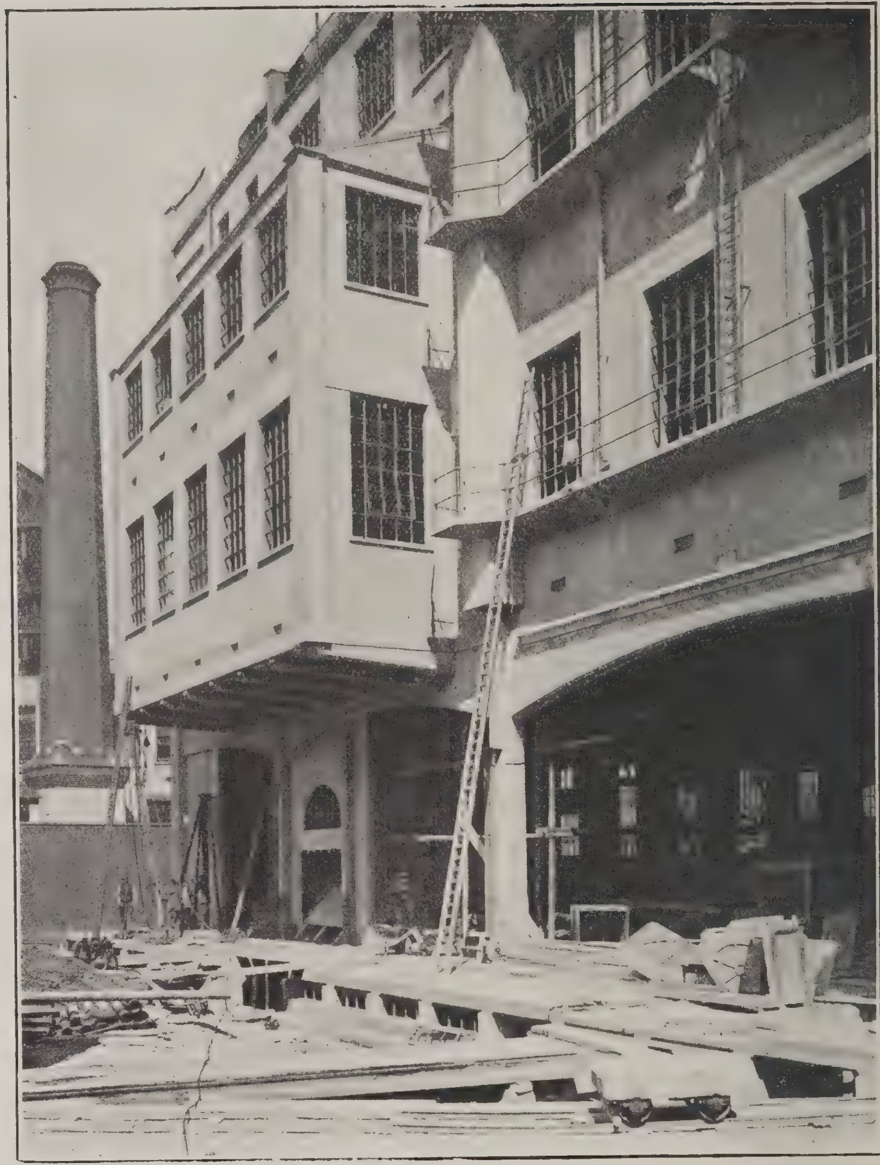
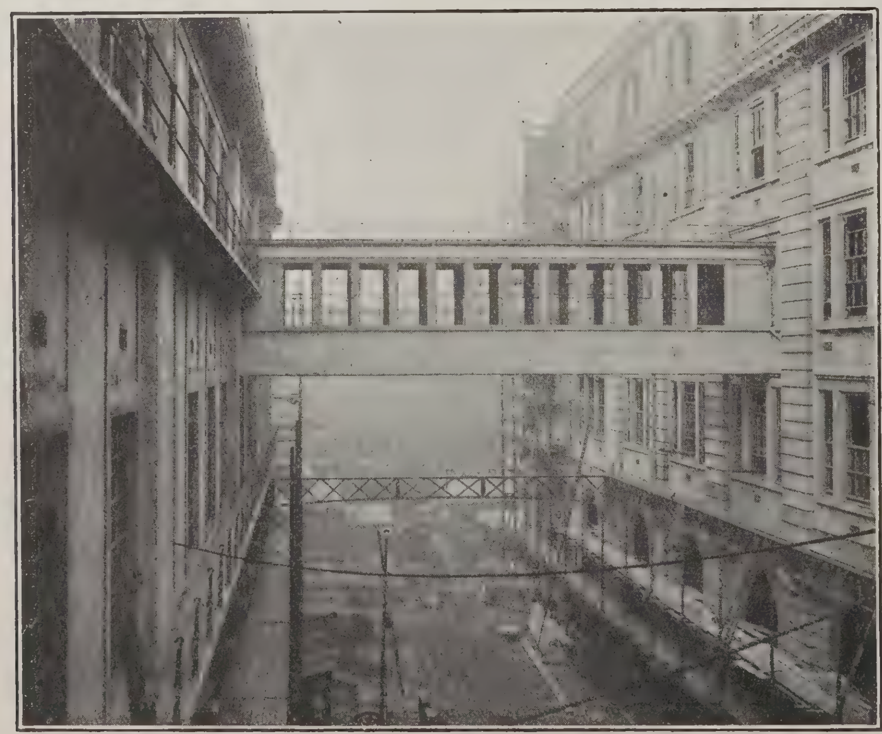


Photo: Topical.

THE KING EDWARD BUILDING, GENERAL POST OFFICE, LONDON.

This is a detail view of the west elevation of the block, showing cantilevered portion projecting 12ft. 6ins.



THE KING EDWARD BUILDING, GENERAL POST OFFICE, LONDON.

This is a view of the loading yard between the Public Office and the Sorting Office blocks of the New General Post Office Buildings, Newgate Street, E.C., and shows clearly the bridge, 51 feet in span, connecting these two blocks. The left end of this bridge is supported on cantilevers projecting 12 ft. 6 in. in cantilever. Another feature is the cornice on the right hand of the picture, which projects 3 ft. 2 in. from the face of the 8.in. wall, into which it is tailed down by means of steel bars. This cornice has not been rendered, but was cast in situ, wrought centering being used, and specially prepared moulds, so that the surface should be smooth and of a good finish.

Concrete Views and Reviews.

A Reinforced Concrete Catalogue.

A Handbook for Engineers and Architects. L. G. Mouchel and Partners, 38, Victoria Street, Westminster.

The Hennebique system of reinforced concrete has been energetically pushed in this country for the past ten years, and in that time it has made great strides, for there are now 600 reinforced concrete structures in Great Britain and Ireland designed on this system. The success obtained with it is attributable to the facts, first, that it was one of the earliest to arrive from abroad, where the subject had been studied closely, and extensively adopted, though reinforced concrete was patented by Wilkinson in 1854; secondly, that M. Hennebique devised rules for calculating the strength of reinforced concrete, based on the results of experimental investigation which enabled the firm to produce and execute very economical designs; and thirdly, to the commercial ability of the late M. L. G. Mouchel, M. Hennebique's agent in this country. Some fine catalogues have been issued by Messrs. L. G. Mouchel and Partners, and these productions have been noted for the careful way in which they have been compiled, and for their excellent get up, with their many photographic illustrations. In those catalogues, however, the time was not ripe to discuss the theory of reinforced con-

Photo: *Topical.*

THE KING EDWARD BUILDING, GENERAL POST OFFICE, LONDON.

Here can be seen the erection of the stone walls of the facade around the ferro-concrete construction. The lightness of the main stanchion in the foreground is typical of the great strength which reinforced concrete possesses.

crete design and construction in great detail, though much information suitable for general consumption was provided, and even to this day M. Hennebique and his agents do not divulge their own methods of calculation, nor can we expect them to do so. In the last few years, however, the subject has received much attention from a theoretical point of view, and much has been published on the subject. The Hennebique firm now find themselves assailed by many competitors, and they have recently published as a pamphlet their standard specification for reinforced concrete work constructed on their system, and now issue this pamphlet as a contribution to the theory and practice of the subject. Of course all catalogues of this nature contain partisan statements, and their arguments cannot in every instance be accepted without question. But from the criticisms they contain of each other's methods the outsider can often glean a good deal of information which will be of considerable assistance in enabling him to judge the real merits of rival systems —and, indeed, perhaps to enable him to discard all and devise his own design. In reviewing this pamphlet we might deal with each item of contentious matter in detail, but in the present state of knowledge of the subject it would be distinctly unwise to dogmatise, and where there is any doubt we prefer to leave the question open for time to determine the merits or demerits and the place of each system. We may, however, draw attention to a few of the salient points of the catalogue. In the earlier Hennebique

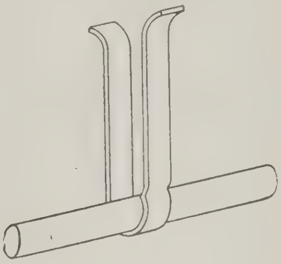
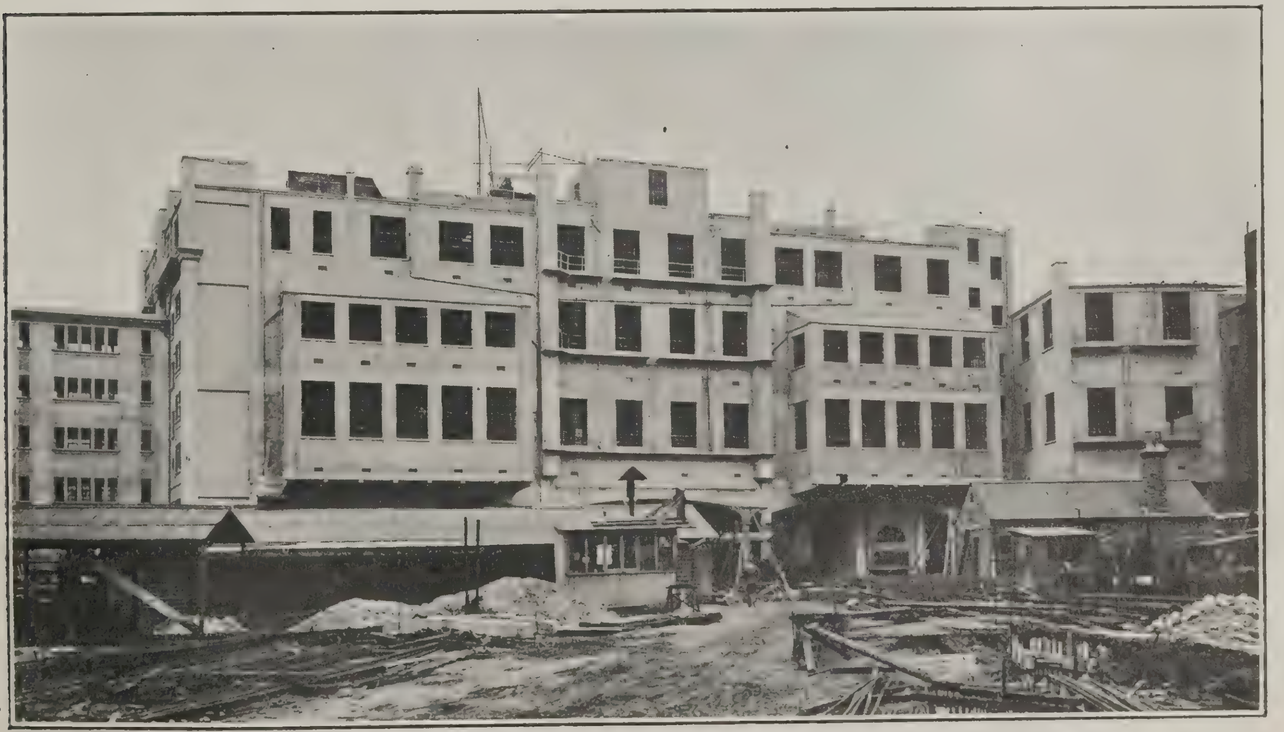


Fig. 1. Hennebique Stirrup.

(*Continued on page* 590)

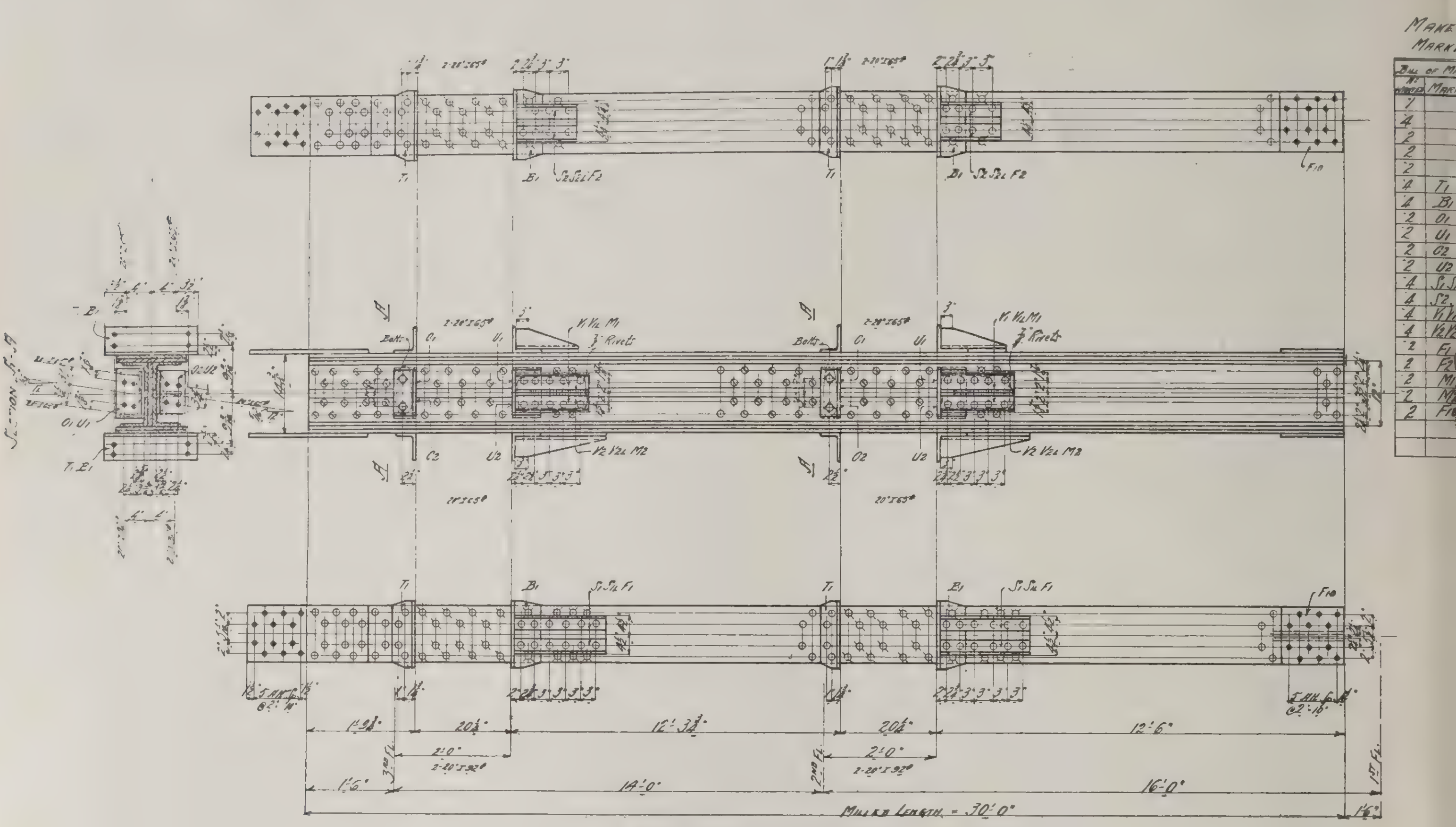


THE KING EDWARD BUILDING, GENERAL POST OFFICE, LONDON.

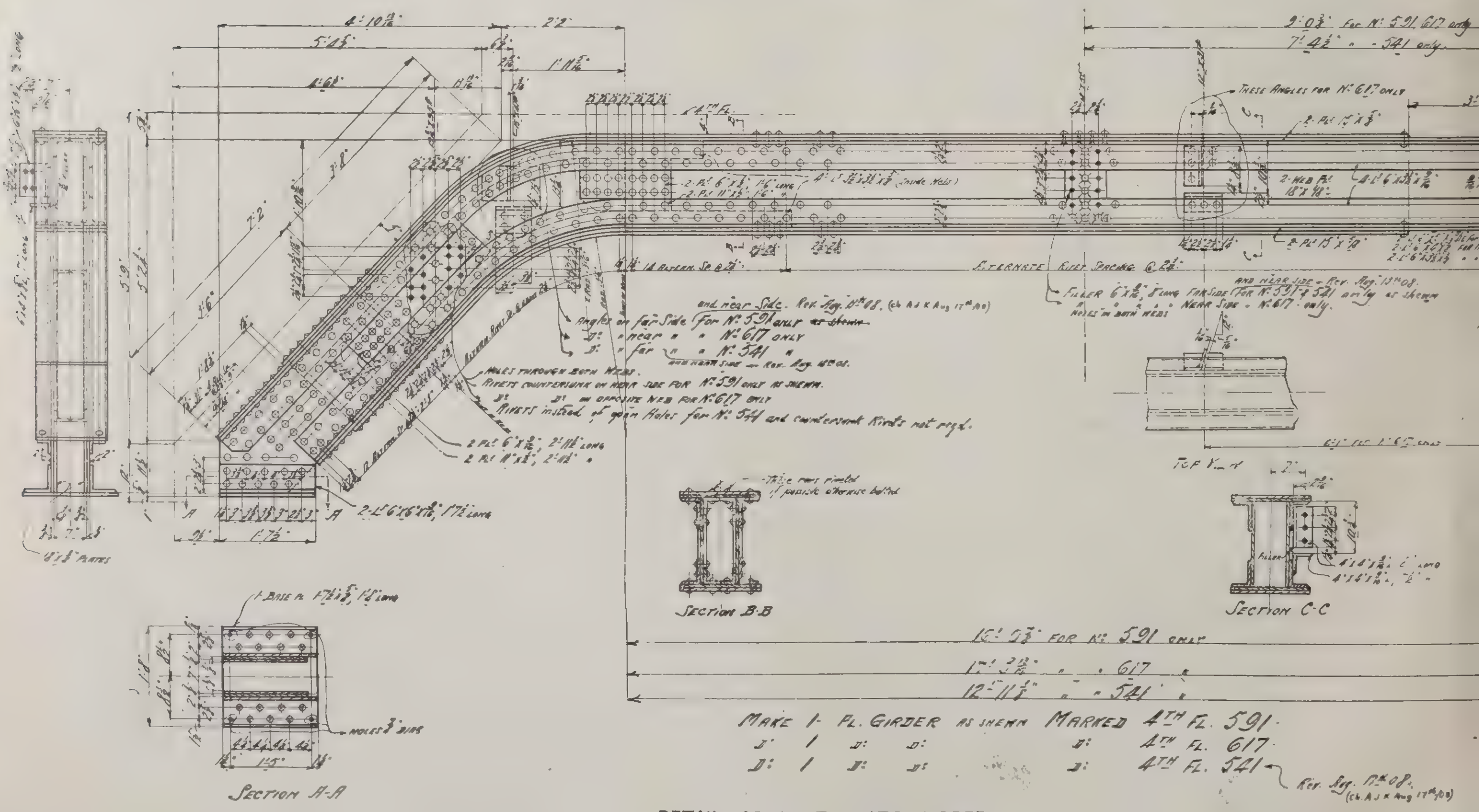
This is a view of the west elevation of the new G.P.O. in Newgate Street. The projecting portions are cantilevered out 12 ft. 6 ins. from the main face interesting to note that as these projecting portions will probably be some day connected up to another extension, the west end walls of same were built of b that they might be more easily pulled down than ferro-concrete work.

SPECIAL STEELWORK DETAILS

R. Frank Atkinson, F.R.I.B.A., Architect. **Waring and White,**



SHOP DRAWING FOR STEEL COLUMNS.

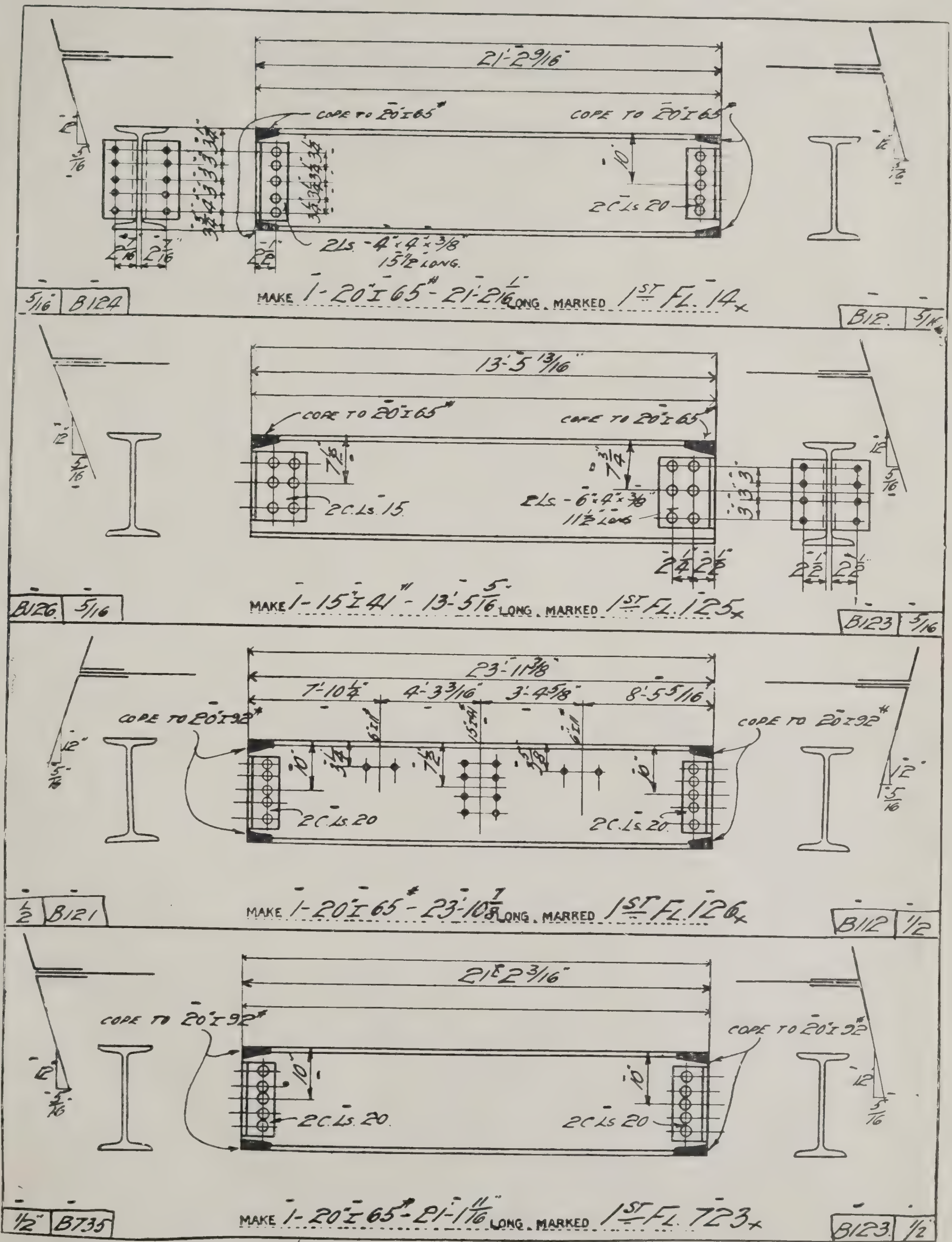

Section A-A
Section B-B
Section C-C
10' 7½" for No. 591 only
12' 3½" " 617 "
12' 11½" " 541 "
Make 1 Pl. Girder as shewn Marked 4th Fl. 591
D° 1 D° D° D° 4th Fl. 617
D° 1 D° D° D° 4th Fl. 541
Alternate Rivet Spacing @ 2½"

DETAIL OF BENT PLATE GIRDER.

These illustrations represent specimen shop drawings (of course, reduced for reproduction) of the steelwork used in the construction of the Selfridge Store. We have, in several issues, given authoritative illustrated descriptions of the constructive work, and the present diagrams are the last of the series. Considering the magnitude of the undertaking, the comparative novelty in this country of the system of construction, the ingenuity with which unusual difficulties have been overcome, and withal the artistic grace and dignity that have been imparted to a building in which those qualities, though eminently desirable, were by no means easy of

AT THE SELFRIDGE STORE.

neral Contractors. **S. Bylander, Engineer for the Steelwork.**



SHOP DETAILS FOR BEAMS.

ainment, we have felt justified in devoting rather extraordinary amount of space to subject; and our desire to present an equate account of what is from many ints of view one of the most remarkable buildings of modern times, has been most courteously facilitated by the proprietor (Mr. H. Gordon Selfridge), by Messrs. Waring and White, the general contractors, by Mr. R. Frank Atkinson, F.R.I.B.A., architect, and by Mr. S. Bylander, the engineer for the steelwork. Bent girders had to be introduced at the fourth floor, next to Somerset Street, owing to ancient light difficulties. The girder is of box section, and can carry two storeys.

(*Continued from p. 587.*)

work a simple U-shaped hanger of flat strip-metal was used to resist diagonal tension; we now find in this catalogue that this has undergone modification in detail, being given a dent at the side, as shown in Fig. 1 on page 587, so as to clip round the round-bars by its own springiness, for the purpose of preventing it getting out of place and being removed from close contact with the main bar by the operation of tamping the concrete. The pamphlet contains an argument that the vertical position of such web-members is the most efficient, both theoretically and practically, and it is argued that plain bars provide quite sufficiently for adhesion, though the additional precaution is taken by M. Hennebique against their slipping, of providing a bond at the ends of rods by splitting them open at these ends. In view of this it seems to us that the argument earlier in the pamphlet, that mechanical bonds cut into and damage the concrete might apply equally to the split ends. Information on the theory of pile design is provided.

Two Pamphlets on Reinforced Concrete.

Reinforced Concrete Construction. By W. Noble Twelvetrees, M.I.Mech.E., etc.; price 1s. London: "Local Government Officer," 36-38, Whitefriars Street, E.C.

Simplified Methods of Calculating Reinforced Concrete Beams. By W. Noble Twelvetrees, M.I.Mech.E., etc., price 6d. London: Whittaker and Co., 2, White Hart Street, Paternoster Square, E.C.

Two small pamphlets on reinforced concrete have been written by Mr. W. Noble Twelvetrees, who wrote "Concrete Steel" and "Concrete Steel Buildings." The first is on the general subject of such construction, and is a useful summary. We do not much like Mr. Twelvetrees's symbols, which he suggests are so much better than those of other authors. He has been trying to standardize symbols for calculations in reinforced concrete, but he is wrong to say, in the second pamphlet, that there is "no marked indication of approaching agreement to be found among theorists and practical enquiries of any individual nature in respect to standard notation and algebraical forms, and still less of any international movement in the same direction," for in England we are standardizing such notation, and also an international notation is being drawn up, and there is very great hope of agreement being arrived at very shortly. The first pamphlet contains some useful notes on practical construction, though there is nothing very new in them.

The United Kingdom Fire-Proofing Company's Catalogue.

The latest catalogue issued by the United Kingdom Fireproofing Co., Ltd., of 47, Victoria Street, London, S.W., is excellently produced. It contains isometric drawings of the various forms of reinforced concrete fireproof floors constructed by the company, and views of fireproof partitions, also an ingenious expansion block for preventing damage to walls by the expansion of solid concrete floors, working drawings of designs for reinforced concrete racecourse stands, tanks, baths, and a water tower. The main portion of the book consists of photographic views of works executed by the firm which have either been completed or are in course of construction. From these it is evident that though the company has only been in existence for a very short time, it has secured a great amount of work, and executed fireproof floors in many notable buildings. We reproduce in this issue some views of the new chemical laboratory at Cambridge in which the United Kingdom Fireproofing Co. executed fireproof floors, roofs, ferro-concrete main beams, lintels, and staircases, etc., for the architects, Messrs. Stevenson and Redfern. The floors were constructed of hollow concrete tubes supported on reinforced concrete beams, covered with a concrete filling; the hollow tubes were utilised for air ducts to radiators, cable trenches, etc. The floors were designed to carry a load of 2 cwts. per foot super, and the working drawing here reproduced shows the framing and detailed arrangement of this rather interesting, and by no means simple piece of work.

Concrete Construction.

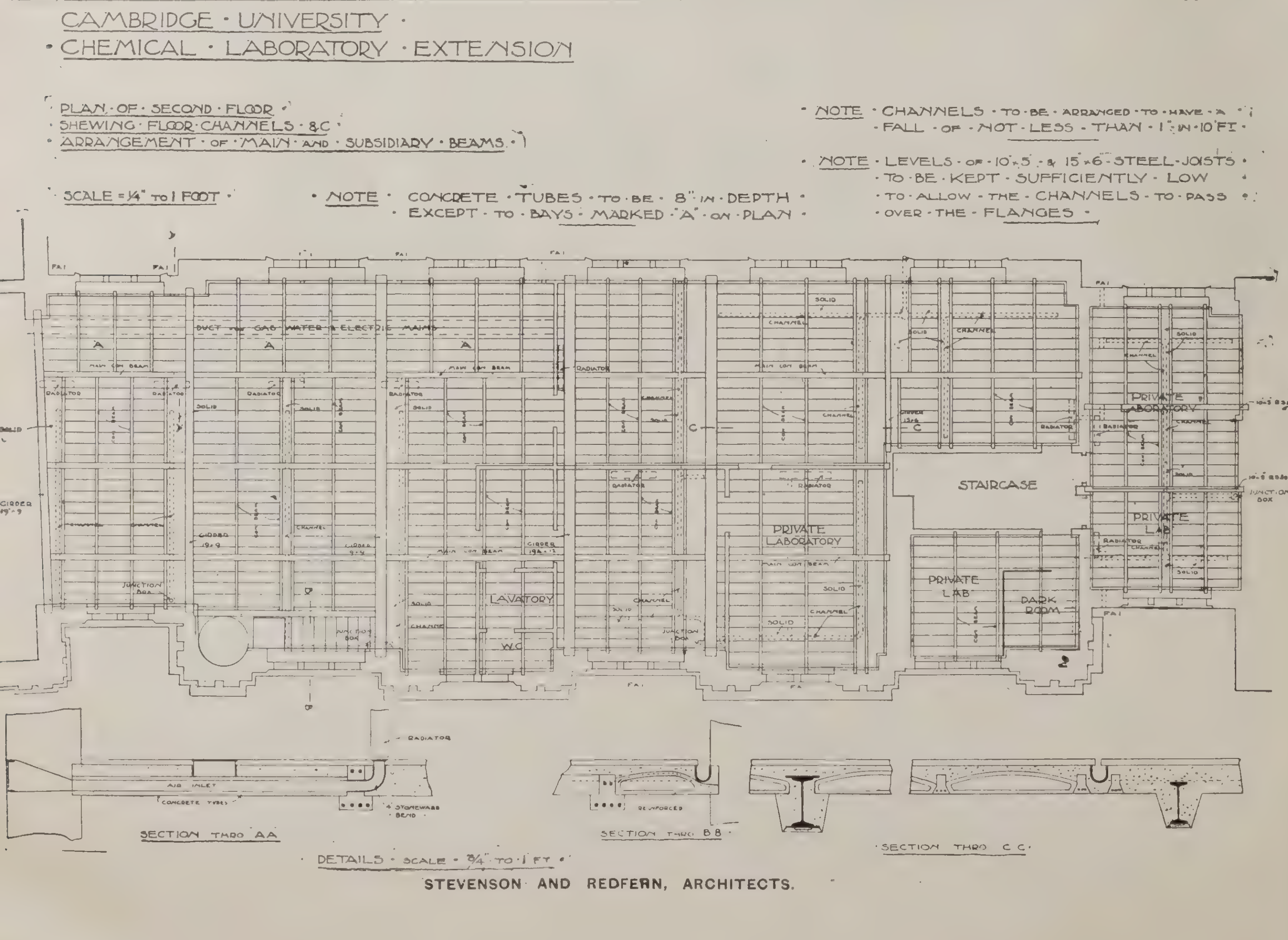
This little volume ("Concrete Construction: Form Work, Estimating, Superintendence, Inspection, Cost, etc." Cleveland, U.S.A.: The Technical Publishing Co., Price 50 cents) deals with practical construction and the execution of works chiefly of reinforced concrete. The notes on centering and methods of executing large jobs are most valuable, and, carefully studied, should result in much economy to contractors.

Hotel in Reinforced Concrete.

Two pamphlets have been published by the Trussed Concrete Steel Co., Ltd., of Caxton House, Westminster, S.W. The first is an article on the new addition to Chateau Frontenac, Quebec, a famous Canadian Hotel. This building has been constructed of reinforced concrete on the Kahn system throughout the interior, the elevations being of stone. The work was of considerable magnitude, and this article by Mr. Gustave Kahn contains much interesting and useful information, with particulars of the design, contracting methods, and cost. The second pamphlet is a price list showing the use of Kahn bars for the construction of concrete lintels, giving standard weights of reinforcement, and sizes of lintels for various spans.

A French Work on Calculations.

The ordinary accepted theory for the calculation of reinforced concrete members is only varied in different countries by slight differences in the factors taken; the main principles remain the same. Thus the report of the R.I.B.A. committee


CAMBRIDGE · UNIVERSITY ·
· CHEMICAL · LABORATORY · EXTENSION
PLAN · OF · SECOND · FLOOR ·
· SHEWING · FLOOR · CHANNELS · &C ·
· ARRANGEMENT · OF · MAIN · AND · SUBSIDIARY · BEAMS ·
· SCALE = ¼" TO 1 FOOT ·
· NOTE · CONCRETE · TUBES · TO · BE · 8" IN · DEPTH ·
· EXCEPT · TO · BAYS · MARKED · "A" · ON · PLAN ·
· NOTE · CHANNELS · TO · BE · ARRANGED · TO · HAVE · A ·
· FALL · OF · NOT · LESS · THAN · 1" IN · 10 FT ·
· NOTE · LEVELS · OF · 10" × 5" · & 15" × 6" · STEEL · JOISTS ·
· TO · BE · KEPT · SUFFICIENTLY · LOW ·
· TO · ALLOW · THE · CHANNELS · TO · PASS ·
· OVER · THE · FLANGES ·
DUCT FOR GAS WATER & ELECTRIC MAINS
A
MAIN CON BEAM
RADIATOR
SOLID
CHANNEL
GIRDER
JUNCTION BOX
LAVATORY
WC
PRIVATE LABORATORY
STAIRCASE
PRIVATE LAB
DARK ROOM
C
SECTION THRO AA
AIR INLET
CONCRETE TUBES
STONEWARE BEND
SECTION THRO BB
REINFORCED
SECTION THRO CC
· DETAILS · SCALE · ¾" TO 1 FT ·

STEVENSON AND REDFERN, ARCHITECTS.

BRIDGE UNIVERSITY CHEMICAL LABORATORY EXTENSION. GENERAL VIEW OF THE FACADE. STEVENSON AND REDFERN, ARCHITECTS.

A noteworthy and interesting example of fire-resisting construction.

agrees with the official instructions of the French Minister of Public Works and of the German and Swiss Governments. The books of various theorists in all languages produced to-day are therefore in general agreement, and in this latest work of M. Séguéla ("Eléments de Résistance des Matériaux appliquée au Béton Armé." Par R. Séguéla, Ancien élève de l'Ecole Polytechnique, Paris: Librarie Polytechnique, Ch. Béranger, Editeur, 15, Rue des Saints-pères), we have nothing particularly novel. He performs good service, however, in so clearly and so succinctly summarising the methods of calculation in so a handy form. The book is illustrated with a few diagrams explanatory of the text, and the demonstrations are very well done. In reading such a work one sees the great advantage there would be in an international notation. A very valuable feature of the work are the examples used to illustrate each part of the work. Pieces subjected to compression, tension, bending, etc., are each taken in turn, and the book is concluded by tables to facilitate calculations.

The Concrete Institute Transactions.

The second part of volume I. of the "Transactions and Notes of the Concrete Institute" is now before us for review. It contains notes of the standing committees appointed and their constitution, and the petition of the Institute against the London County Council (General Powers) Bill now before Parliament for amending the Building Act, in respect to permitting structures to be erected of reinforced concrete. The volume also contains the balance-sheet for 1908, which shows the society to be in a strong position, and verbatim reports of papers read at general meetings by Mr. L. Serraillier and Mr. E. P. Wells, and the discussions that took place thereon. This volume is even more interesting and useful than the first. It contains a mass of information, Mr. Wells's paper alone serving as almost a text-book on how to mix and use plain concrete in bridge construction, with particulars of a most interesting series of tests. The Concrete Institute has now a very large membership, *i.e.*, over 750, and it is one of the most progressive and important technical societies. Its membership is growing rapidly, and for this the excellent work it is doing and the valuable papers read before it are no doubt in great part directly attributable. The Transactions are published at 1, Waterloo Place, Pall Mall, S.W.

Notes and News.

Mr. Edwin T. Hall has been appointed by the Council to represent the Institute at a Conference which is being organised by the Engineering Standards Committee to consider the desirability of a standard being adopted for stoneware, fireclay, and other similar pipes.

* * *

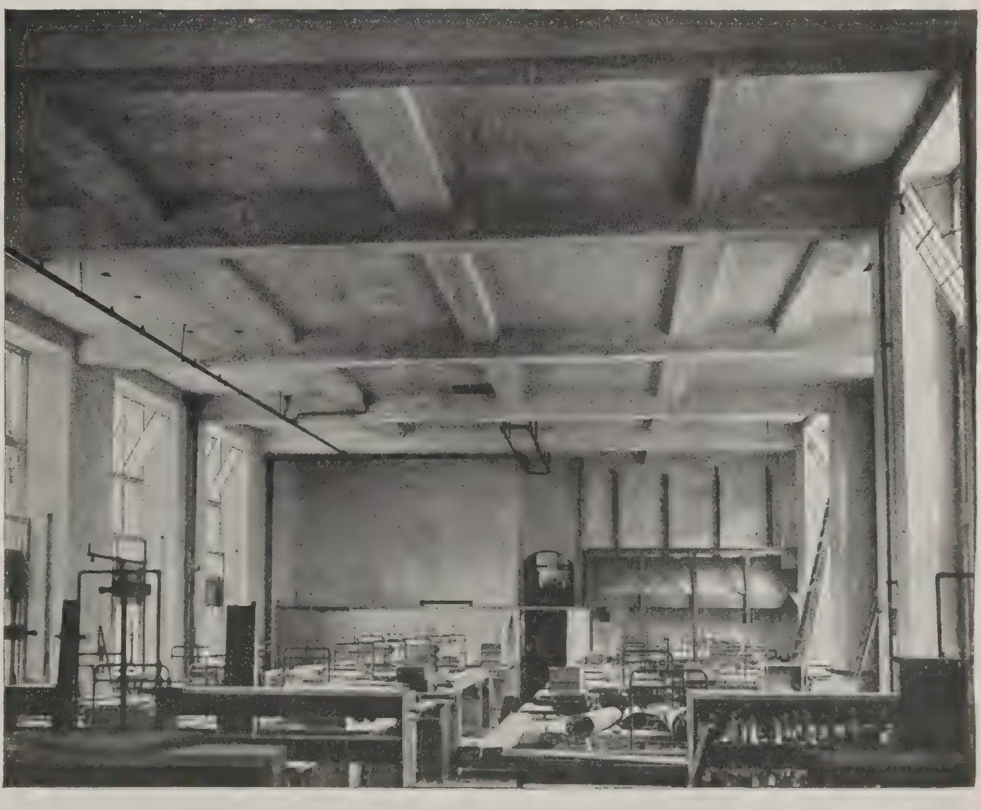
We are informed that rapid progress is being made with the huge building that is being erected at Liverpool for the Royal Liver Insurance Company. Messrs. A. and F. Manuel, of Gracechurch Street, London, are supplying and fixing the granite work, and the general contractors are Messrs. Nuttall and Son.

* * *

The "I.C.S. Student" for June, the organ of the International Correspondence Schools, Ltd., International Buildings, Kingsway, London, contains much interesting matter that justifies the sub-title, "A Journal of Inspiration to Self-Help." From this periodical it appears that the movement is flourishing exceedingly, and that the institution is successful not only in systematising study, but in organising the students, who, we observe, are encouraged to unite in social functions, such as concerts, as well as in educational effort, and the strenuous life.

* * *

An arbitration case between the Lambeth Borough Council and the London County Council, arising out of the erection of the new London County Hall, on the south side of the Thames, near Westminster Bridge, was opened at the Surveyors' Institution, Great George Street, on June 17th, before Mr. Samuel Walker. The site of the new County Hall, in respect of which claims have already been settled, will include that previously occupied by a large wharf owned by the Lambeth Borough Council, who accordingly claimed originally for a sum of about £180,000. Agreements had been arrived at in respect of compensation for disturbance, machinery, etc., and the revised claim to-day stands at £107,813 for land and buildings.



CAMBRIDGE UNIVERSITY CHEMICAL LABORATORY EXTENSION. INTERIOR OF ONE OF THE LABORATORIES. STEVENSON AND REDFERN, ARCHITECTS.

The floors are constructed of hollow concrete tubes supported on reinforced concrete beams, covered with a concrete filling.

With reference to the illustrated account of Sennowe Hall, Norfolk, appearing in last week's issue, we are informed that the metal casements and leaded lights to the new lodges were supplied by Messrs. George Wragge, Ltd., 152, 154, and 156, Chapel Street, Salford, Manchester.

* * *

A company has been formed, and a site has been secured on the Duke of Devonshire's estate, Carlisle, for the erection of a large roller skating rink. The preparation of the plans is in the hands of Messrs. Oliver and Dodshun, architects, Carlisle. Roller skating is fast becoming as popular in this country as it has long been in America. Many rinks are being constructed in London and the provinces, and we are informed that the proprietors are studying the safety of their patrons by the extensive use of fireproof Uralite in the construction of such buildings.

* * *

The Garden City Association has now concluded arrangements with the German Garden City Association for about two hundred members of the latter body to visit this country next month. Their first trip will be to York on July 7th, when they will inspect the cottages and garden suburb of Earswick, which have been built by Messrs. Rowntree for the benefit of their workpeople. On July 8th the party will pay a visit to Manchester and inspect the housing works there and at the Co-partnership Tenants' estate just outside the city. At Liverpool there are the extensive works of the Corporation in building model dwellings in place of slum cottages, and these will be seen on July 9th. In the course of two or three days in the neighbourhood the party will also see Port Sunlight, Messrs. Lever's model village, and on the 12th Birmingham will be also visited, and the town efforts at slum patching will be seen, while Bournville and Harborne will also be inspected. Letchworth (Garden City) will be visited on the 13th, Hampstead on the 14th, and Ealing on the 15th. The party will probably return on the 17th.

BUILT-IN BEAMS.

By R. D. Whitehead, A.M.I.Mech.E.

In dealing with the case of beams built-in at the ends, the writer discovered a simple method of obtaining the curve of bending moments, and of correcting the shearing forces, which he believes to be quite original, and which is applicable to all methods of loading. The method is here illustrated, with examples:—

General method:—

(a) Draw the diagram of bending moments and shearing forces, for a beam supported at the ends only.

(b) Convert the bending moment diagram into a triangle of equal area, on the same base as the bending moment diagram.

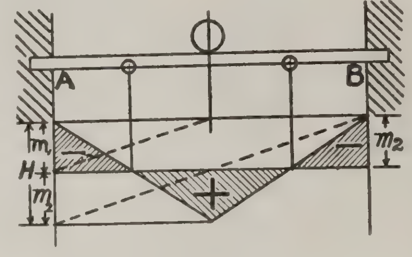
(c) Draw a vertical line through the centre of gravity of the load or loads.

(d) Project the height of the triangle found in (b) on to one of the abutments A or B.

(e) Join this point (d) to the opposite angle of the base of the bending moment diagram.

(f) From the point where the vertical through the centre of gravity of the load or loads (c) cuts the base of the bending moment diagram, draw a line parallel to the line found in (e). This parallel will divide the distance marked H in the diagrams into two segments, whose values m_1 and m_2 respectively, are the torques necessary to keep the beam horizontal.

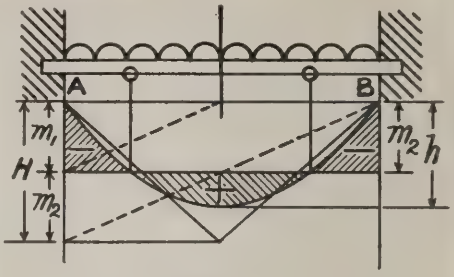
(g) Measure these values on their respective abutments, i.e., M_1 on A and M_2 on B, and join by a line. This line will divide the diagram obtained in (a) into portions of equal area, shown by the + and — signs; it also fixes the points of contraflexure as shown marked o.



EXAMPLE 1.

(h) If a line is drawn parallel to the line joining m_1, and m_2 from the pole of the polar diagram to cut the line of loads, this will fix the point from which the new base of the shearing force diagram must be drawn (shown dotted in examples III. and IV.

Example I.—A uniform beam of rectangular section, built in at the ends and carrying a central load W. Draw bending moment diagram.



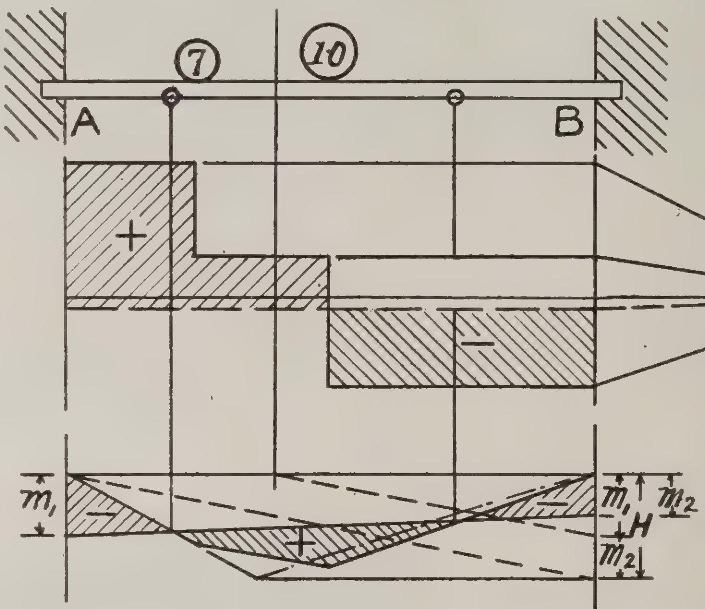
EXAMPLE 2.

(a) The bending moment diagram is a triangle, with its vertex directly under W, whose altitude equals $\frac{WL}{4} = H$.

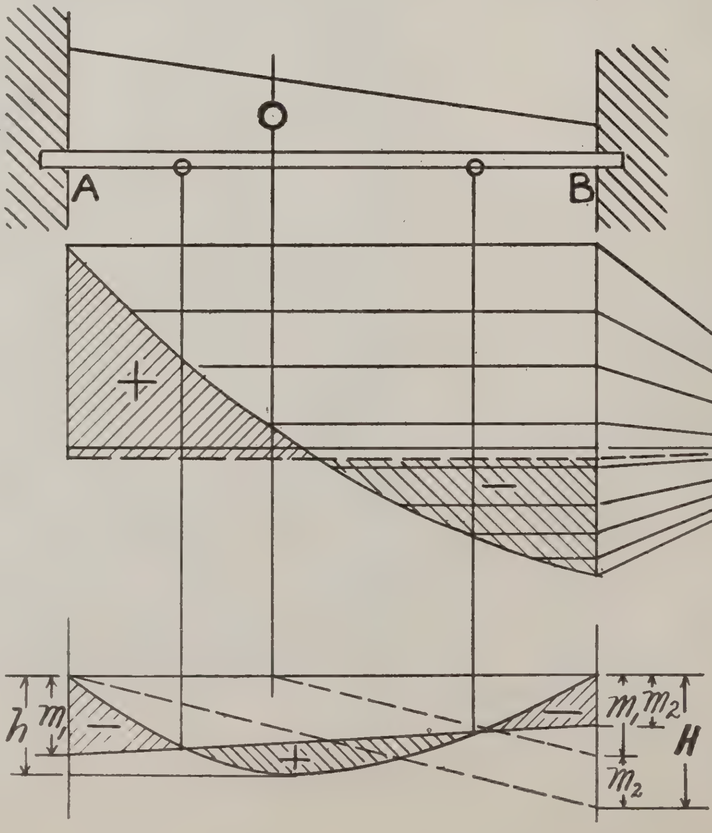
(b) is equal to H found in (a).

(c) This line passes through W.

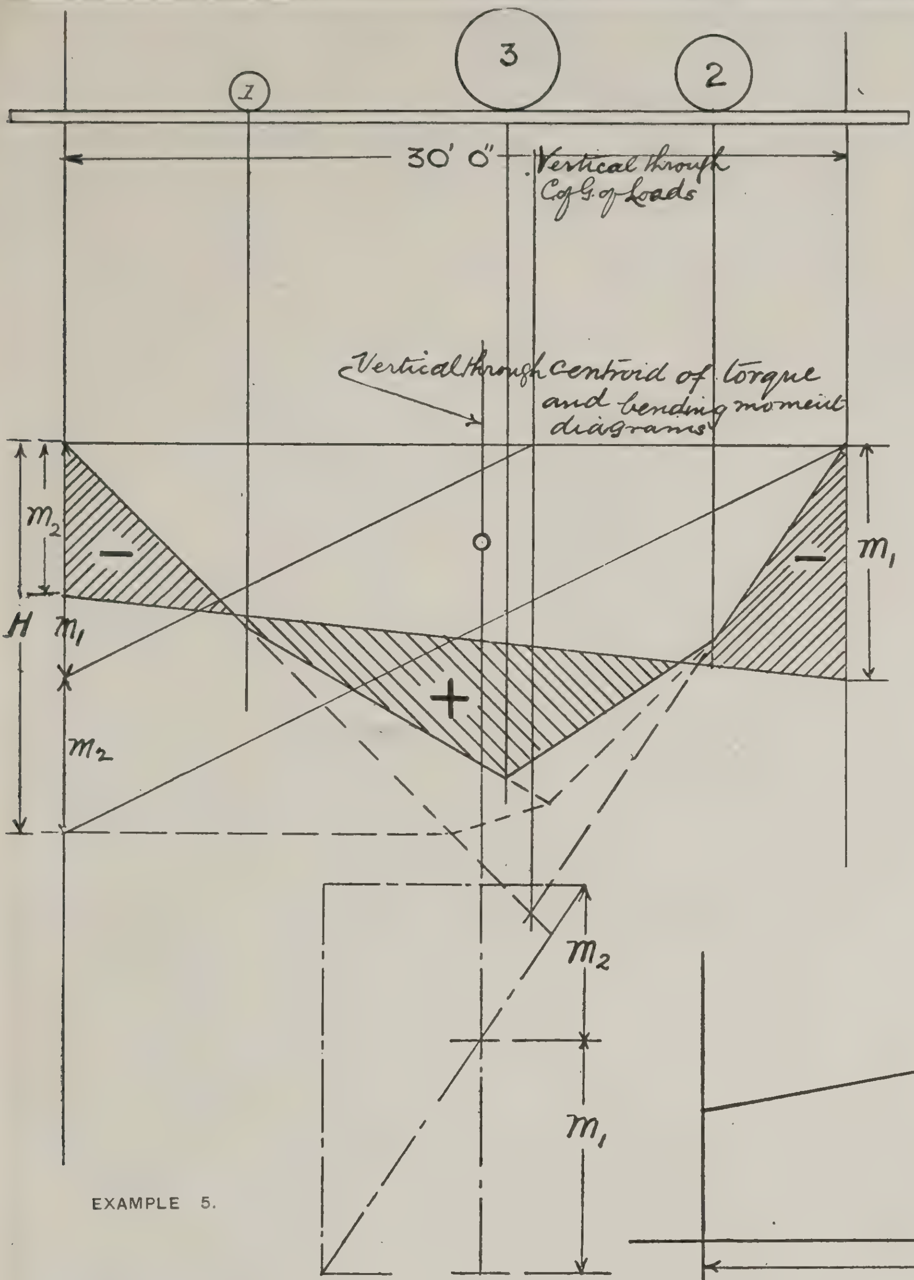
For (d), (e), (f), (g), see diagram, and note that m_1 equals m_2. When this is the case the shearing force diagram requires no correction.



EXAMPLE 3.



EXAMPLE 4.


1
3
2
30' 0"
Vertical through C of G of Loads
Vertical through centroid of torque and bending moment diagrams
m_2
m_1
H
m_1
m_2
−
−
+
m_2
m_1

EXAMPLE 5.

Example II.—A uniform beam of rectangular section, built-in at the ends, carries a uniformly distributed load of w lbs. per foot run. Draw diagram of bending moments.

(a) The bending moment diagram is a parabola whose vertex is directly under the centre of the span, and whose maximum ordinate equals $\frac{WL}{8}$ equals h

(b) In this case H equals $\frac{4h}{3}$

(c) This line passes through the centre of the span. For (d), (e), (f), (g), see diagram, and note that m_1 equals m_2, as in Example I.

Example III.—A uniform beam of rectangular section, 20ft. span, is fixed at the ends. It carries a load of 10 tons at the centre, and one of 7 tons at 5ft. from one end. Draw the diagrams of bending moments and shearing forces.

(a) Draw by means of a polar diagram.

(b) Draw by applying a construction based on Euclid, Bk. I. Prop. 37, to find H.

(c) Find (c) from (a).

For (d), (e), (f), (g), proceed as in previous examples, taking notice that m_1 does not equal m_2, (h) draw as described in "General Method."

Example IV.—A uniform beam of rectangular section, 20ft. span, is fixed at the ends, and carries a load which varies uniformly from 1 ton at B, to 4 tons at A. Draw the diagrams of bending moments and shearing forces.

(a) Draw by means of a polar diagram. It will be found to approximate so closely to a parabola that we may, without appreciable error, treat it as such; then H equals $\frac{4h}{3}$.

(b) Altitude of triangle equals H.

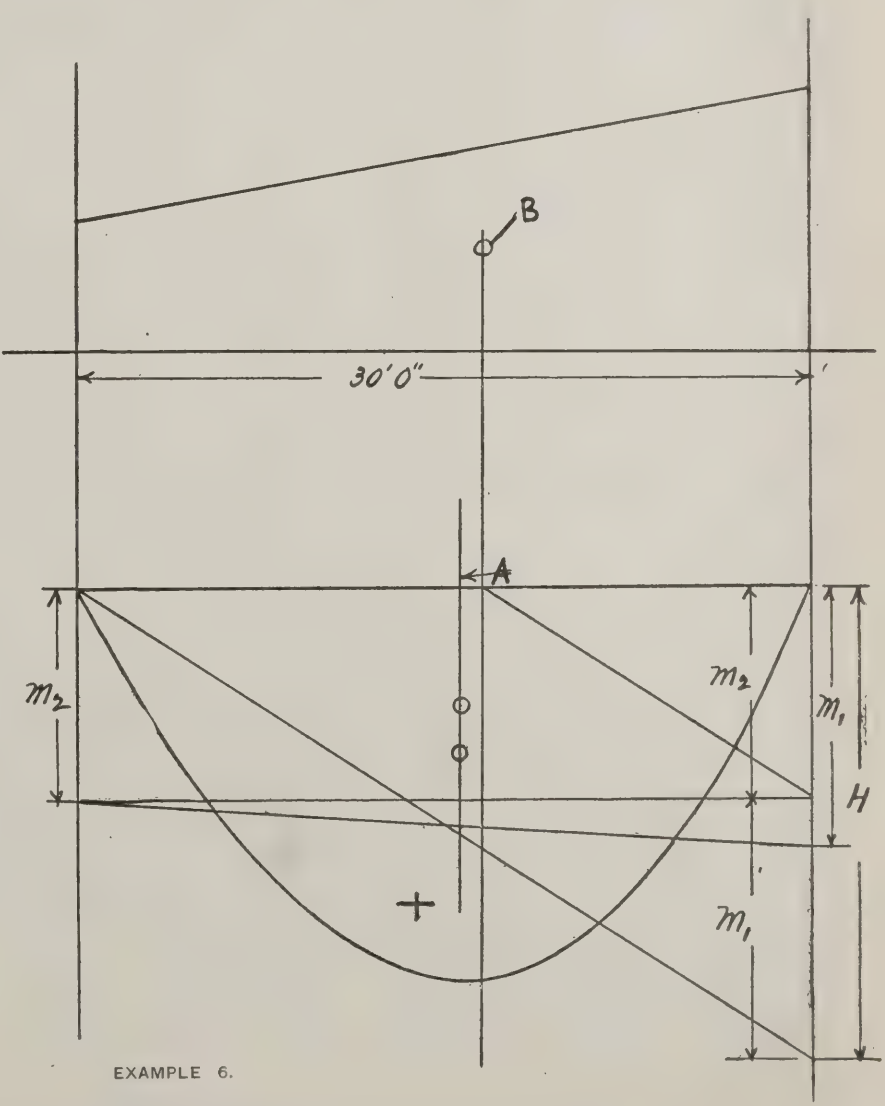
(c) Find the centre of gravity of the loading by a graphic construction.

For (d), (e), (f), fg), (h), proceed as in previous examples. Any other case must be treated in exactly the same way. If any particular difficulty is experienced in obtaining the height H of the equivalent triangle, measure the area of the bending moment diagram (a), using a planimeter. Then divide the area found by half the span; this fixes H. Also if the load diagram is very irregular, its centre of gravity can easily be found by cutting it out from thin cardboard, making a pinhole at a point near the edge. Then suspend the diagram in a vertical plane, on a pin, to which is attached a plumb-bob and line. Draw the line of the plumb-bob thread on the figure, and repeat this process from some other point; the intersection of the two lines so obtained is the centre of gravity of the load diagram.

The proof of the construction depends upon the fact that the centroids of the torque and bending moment diagrams fall upon the same vertical line. When this is the case, the − areas equal the + areas; as required in the case of built-in beams.

In Fig. 6, A indicates vertical through centroids of torque; B, centre of gravity of loads.

The writer does not object to anyone using this method by incorporating it in text books or pamphlets, provided due acknowledgement is made of the source.



EXAMPLE 6.

A. Vertical through centroids of torque and bending moment diagram.
B. Centre of gravity of loads.

Federation News.

MANCHESTER, SALFORD, AND DISTRICT ASSOCIATION.

Secretary: John Tomlison.

The monthly meeting of the General Committee of Manchester, Salford, and District Association was held at the Board-room, Manchester, on Thursday, May 20th, Mr. George Macfarlane presiding.

Four new members were elected into the association, bringing up the total to 198.

The half-yearly report and statement of accounts were considered and adopted for presentation to the annual meeting.

It was decided to issue the forms for making the annual return of men and apprentices employed to members, as supplied by the National Federation.

Several complaints were considered under the inter-trading rule.

The annual general meeting of the association was held immediately after the committee meeting, Mr. George Macfarlane presiding over a good attendance of members.

The committee's half-yearly report and annual statement of accounts were taken as read, and adopted for circulation to the members. The report, which is rather lengthy, is very interesting to members, inasmuch as three of the branches are, or have been, dealing with operatives for alterations in their working rules.

Mr. Samuel Gerrard, of the firm of Messrs. J. Gerrard and Sons, Ltd., contractors, Swinton, was elected president for the ensuing year.

A vote of thanks was passed to the retiring president, Mr. George Macfarlane, for his services during the past year, and was suitably acknowledged.

Mr. Harry S. Daniels (Messrs. Jas. Daniels and Sons, builders, Pendleton), and Mr. William Tinker (Messrs. Young, Tinker, and Young, builders), were elected senior and junior vice-presidents respectively. Mr. James Higson, J.P., plasterer and painter, Salford, was elected hon. treasurer, and Messrs. John Gibbons and W. Green were elected hon. auditors.

The General, Emergency, and Branch Committees were elected in the usual way, and also the representatives on the Lancashire and Cheshire Federation Executive and Trade Committees.

A long discussion took place regarding the desirability of enforcing the inter-trading rule, and after a very lengthy discussion, it was decided that the same come into operation in this district as from September 1st next.

A communication was received from the Master Painters' Association regarding the growing tendency of the Manchester and Salford Corporations to undertake building and other operations, and the same was referred to the General Committee for consideration.

The stonemasons' branch have met on two or three occasions to discuss their notice to the operatives for a reduction in wages and several alterations to the present working conditions, and the matter was referred to conciliation under the rules. (See below.)

The plasterers' branch have met several times during the month with reference to their proposed amendments to the operatives' working rules, and although the committee have interviewed deputations from the society on two occasions, and offered several concessions, they have been unable to settle the matter. Their notice, however, does not expire until June 11th, and it was hoped that something definite will be arrived at before that date.

At the annual meeting of this branch, held on May 11th, Mr. James Cadman, Swinton, was elected chairman for the ensuing year. The Joint Standing Committee under the N.A.O.P. Agreement was also elected at this meeting. It is regretted that this agreement in its recently amended form is not yet in operation, inasmuch as it provides for conciliation in disputes similar to the one at present pending, practically on the same lines as our National scheme.

The manufacturers of plaster partitions held a further meeting on May 24th for the purpose of considering the question of master plasterers fixing and finishing their partitions.

Manchester Board of Conciliation.

The annual meeting of the Manchester Board of Conciliation was held at the Employers' Board-room, Blackfriars Street, on May 13th, Mr. George Macfarlane in the chair.

Mr. George Macfarlane was re-elected chairman of the Board for the ensuing year, and Mr. T. R. Jones was elected vice-chairman.

Messrs. John Tomlison and J. M. Hughes were elected joint secretaries for the respective parties.

A notice of appeal from the employers and operative stonemasons, in which the employers had given notice for a reduction in wages of 1d. per hour, alterations in the summer working hours, and various amendments in the present working conditions, was before the meeting, and evidence was heard from witnesses from both sides. After hearing the witnesses, several resolutions were moved, with a view to attaining a settlement, but the ballot resulted on each occasion in equal voting; therefore the matter will go before the Northern Centre Board, according to rule.—JOHN TOMLISON, Employers' Secretary.

BARNOLDSWICK AND DISTRICT ASSOCIATION.

Secretary: J. C. Addyman.

A special meeting of the officers of Barnoldswick and District Association was held at the secretary's office, on Monday, May 24th, the president, Mr. E Smith, in the chair.

The meeting was called to consider a letter from the Yorkshire Federation secretary, and a telegram with regard to the proposed outing.

The Federation secretary's letter, suggesting that the Federation June meeting should be held at Skipton or Keighley instead of in Barnoldswick, was first dealt with, and after careful consideration it was resolved that the Federation secretary be written to informing him that, owing to many circumstances, the members could not accede, and urging that the meeting be held at Barnoldswick—if not in June, then at a later date—and intimating that the association is willing to send members to Skipton and assist in inaugurating an association if desired.

The secretary reported that a telegram had been received by the local stationmaster informing him that his company could not arrange for the saloon (required on the occasion of the annual outing to the Dukeries) to be sent nearer than Leeds, and, after due consideration, it was decided that under those circumstances all arrangements with the company with regard to the outing be at an end, and that the local stationmaster be informed to that effect.

BARROW-IN-FURNESS ASSOCIATION.

Secretary: J. Baker.

The monthly meeting of the Barrow-in-Furness Association was held on May 25th, when the question of binding apprentices was again under consideration, and it was decided to adhere to the rules as agreed upon by the masters and operatives. Two new candidates were balloted for membership, and accepted, and another was proposed for ballot at the next meeting.

The secretary reported that the master joiners had met and drawn up a list of prices to be charged for retail work, and it was arranged for the painters and plumbers to meet also for the same purpose.

The insurance under the Workmen's Compensation Act was under consideration, but was deferred for final decision at a special meeting to be held on June 8th.

WAKEFIELD AND DISTRICT ASSOCIATION.

Secretary: J. Beaumont.

A meeting of the Wakefield and District Master Builders' Association was held at the Bull Hotel, Wakefield, on June 3rd, Mr. Tom Lee (president) in the chair. A report of the meeting of the Executive Council of the Yorkshire Federation, held in Hull on May 20, was read, and Messrs. H. Fallas and G. Crook, who attended the meeting on behalf of the Association, made a supplementary report on various matters dealt with at this meeting. A long discussion took place on these reports, including the questions of priced schedules with tenders, and sub-contracting, inter-trading, and insurance against accidents. With regard to the insurance question, Alderman Judge asked for information as to the position of full contractors in case of accidents to sub-contractor's men, and the course to be adopted as to the insurance against accidents to these workmen. Mr. Fallas and Mr. Cook, in reply, stated that the Executive Council were taking legal advice on the matter, and that they expected it would be considered at the June meeting of the Executive Council.

During the meeting a new member was elected in the person of Mr. George Clements, builder, Featherstone, on the proposition of Alderman Judge, seconded by Mr. Scales.

LEEDS ASSOCIATION.

Secretary: J. Davidson.

The monthly meeting of the Leeds Association was held at the Grand Central Hotel on Tuesday, June 8th.

A letter was read from the Town Clerk of Leeds asking for information with respect to the usual practice in the building trade in regard to an allowance for walking time and payment of car fares, and whether payment was made to men who turn up for work but are unable to commence work for reasons over which they have no control. The secretary was instructed to state that as a general practice workmen are expected in Leeds, without allowance, to be on the job at starting time, and that no allowance is made for car fares or for men unable to commence work. The secretary was also instructed to point out that it was a generally recognised custom throughout the country, where employers and workmen were properly organised, to allow them to hear and determine upon all matters or disputes affecting rates of wages and conditions of labour. The conciliation arrangements with many operative societies engaged in the building trade afforded opportunities of this being done without resort to strikes and lock-outs. As the members of the association were required by the corporation to pay the standard rate and observe the recognised conditions of labour, and were under an obligation to observe the same for private as well as public work, they might be most materially affected by a decision of the corporation to depart from the conditions mutually agreed upon, and it was decided respectfully to ask the corporation not to set up any conditions of labour which are not in strict accordance therewith.

The secretary reported the result of his investigation of the accounts of the Education Committee for school repairs, and it was decided to leave the matter over for further consideration and attention.

A letter was read from the bricklayers' society calling attention to the fact that the erection of slabs for division walls was being carried out in some instances by plasterers, and claiming that this work should be exclusively done by bricklayers. After careful consideration, the members were unanimously of opinion that the matter was essentially one to be determined in the first instance between the operative societies directly concerned, and recommended that this procedure should be adopted.

The provisions of the Housing, Town Planning, etc., Bill in connection with the erection of back-to-back houses was also considered. It was felt that the strictures upon such erections which have been made in many quarters are not applicable to the style and character of houses erected in Leeds, and that the opponents of such houses did not appeciate the high standard and complete sanitary arrangements which such property affords. It would be disastrous to the building trade if any hindrance to the erection of workmen's dwellings at a reasonable cost was imposed in towns where land is freehold, and where rents have to be fixed to give a return for capital invested both for the property erected and also for the land occupied. Several members expressed the opinion, from their practical knowledge as builders and observation of properties in other towns, that there was no town in England where the working classes are so cheaply and efficiently housed as in Leeds. It was decided to send a letter to the Leeds Corporation hoping that their efforts to obtain either a substantial amendment or absolute withdrawal of the provisions of the Bill dealing with the back-to-back houses would be entirely successful, and promising to give such assistance as the corporation might deem expedient or helpful.

Several accounts were passed for payment, including further remittance on account of subscription to Yorkshire Federation.

The president invited the members to visit Ilkley on Monday, June 21st, and kindly offered to provide tea for them and their wives. The offer was unanimously accepted, and the secretary instructed to make the necessary intimation with a view to facilitating the arrangements.

Sheffield Building Trades Conciliation Board.

The annual meeting of Sheffield Building Trades Conciliation Board was held at the Builders' Exchange on May 17th, under the presidency of Mr. A. J. Forsdike. Mr. T. Smith was present as secretary for the employers, and Mr. T. Driver as secretary for the operatives. When the minutes of the meeting held on November 11th were submitted to the meeting, the vice-chairman objected that they were not a faithful record of the proceedings. Mr. Lindley said that the minutes unfairly favoured the employers' section of the Board.

Mr. Smith (employers' secretary) said that he entirely demurred from the remarks of Mr. Lindley. The operatives' secretary had approved the draft before they were finally typed off for the joint signatures, with the single exception in reference to an alleged promise of the chairman, about which they were unable to agree, and as the chairman confirmed his (the employers' secretary's) notes that no such promise was made, he refused to insert the paragraph in the minutes, and asked the operatives' secretary if he would sign the minutes, and cover his signature with a letter to the effect that he protested against the alleged omission, and on these conditions he had signed the minutes.

Mr. Driver (employees' secretary) said that the report had necessarily to be cut down. Generally speaking, the minutes were a faithful record, with the exception referred to. After some further discussion, the minutes were eventually passed with one dissentient.

The election of officers for the ensuing year was then proceeded with. Mr. A. J. Forsdike was again unanimously re-elected chairman, and Mr. F. Limage was re-elected vice-chairman.

The employers re-elected Mr. Thos. Smith as their secretary, and the operatives elected Mr. J. T. Welburn in place of Mr. T. Driver.

The method of paying overtime rates was next discussed, at the request of the operatives.

Mr. Lindley said that in several instances joiners, instead of being paid actual overtime rates, had been instructed to put down a certain amount of extra time to cover the extra rate of pay due to them, and if reference had to be made to the time sheets afterwards, it might appear that men had worked overtime at ordinary rates, and they thought that overtime should be paid for in accordance with the rules at time and a quarter, time and a half, or double time, as the case might be.

The Chairman said it was merely a question of method of reckoning, as the method complained of made not the slightest difference to the operatives.

The Chairman promised that the matter should receive the attention of the Master Builders' Association at their next meeting.

The question of a uniform holiday week, which was referred to last year, was again discussed, the Chairman remarking that the M.B.A. were anxious that something should be done in the matter.

Mr. Driver said that all the operatives' societies had reported to him as unfavourable to the proposal, and he thought the employers would not be willing to inaugurate a uniform holiday week this year in view of the destitution in the city.

Mr. Biggin spoke of the disorganisation caused by clerks and others taking their holidays throughout the summer months, and in reply to Mr. Wood, said that it was proposed to shorten the other holidays.

The Chairman said it was proposed to have only one day at Easter and one day at Whitsuntide.

The matter was eventually left over for further discussion by both parties.

The Chairman asked if the Joiners and Bricklayers' Societies had yet come to any decision in regard to their meeting on March 5, when the M.B.A. proposed the abolition of walking time.

Mr. Lindley said that the reports on the subject that had appeared in the local Press were unauthorised, and a resolution to that effect was unanimously passed.

Mr. Stone said that it was still the practice of some employers to make stoppages of 1d. or 2d. a week for Workmen's Compensation Insurance. He thought that every fair-minded employer would agree that the premiums were never intended to be paid by the workmen, and that the members of the M.B.A. should point out to their members that the practice was illegal. The Chairman promised that the matter should receive attention.—THOS. SMITH, Employers' Secretary.

EDINBURGH, LEITH, AND DISTRICT BUILDING TRADES ASSOCIATION.

Secretary: James Cameron.

The monthly meeting of the Executive of Edinburgh, Leith, and District Association was held in the Building Trades Exchange. 61, Lothian Road, Edinburgh, on Thursday. May 27th. There was a good attendance of members, presided over by Mr. David Mekie.

Two new members were admitted.

On the invitation of the Edinburgh School Board, Mr. Simon Slater, builder, and Mr. William Patterson, blind manufacturer, were elected as representatives to the advisory council in connection with the educational information and employment bureau.

Mr. Patrick Knox, plumber, and Mr. Alexander Macdonald, plumber, were appointed to represent the association on the Council of the National Registration of Plumbers.

The secretary reported that the Board of Trade arbiter had now given his award in connection with the Glasgow joiners' wages. The operatives had asked an increase from 9¼d. per hour to 10d., but the arbiter has fixed the wages at 9d. per hour—a reduction of ¼d. per hour, the change to take effect as from July 1st.

The meeting had also under consideration the schedules for a certain contract. At the end of the schedule the usual clauses are inserted for day's work and material, but an innovation has been introduced in respect that the architects issuing the schedules have inserted the rates they are to allow for time and material. It was pointed out that the rate allowed for several of the items was very much under the cost price of the material, and it was felt that the building committee and the law agents who had issued the schedules were not cognisant of how matters stood, and the secretary was instructed to address a letter to the law agents, protesting that some of the prices stated were below the actual cost of material, but that the principal objection to this innovation of inserting prices in a schedule is, that it is directly against fair competition, and that no architect or surveyor has any right to dictate to a contractor the price that he must do certain work for.

Arrangements have been made for the annual excursion to take place on June 23rd to Blairgowrie and Dunkeld.

OLDHAM AND DISTRICT ASSOCIATION.

Secretaries: Cowper and Dean.

After long and careful consideration by the Finance Committee of the Oldham Corporation, who held interviews with the representatives of the Oldham Master Builders' Association, and also with the Oldham Trades and Labour Council, the Oldham Town Council have at last accepted as a basis for construction of the new Fair Contracts Clause—the document reproduced below.

It will be noticed that, after strenuous opposition to the original clauses submitted from the Oldham Trades and Labour Council by the Oldham and District Master Builders' Association, certain objectionable clauses have been removed, such as giving the trades union the sole right to state what is the standard rate of wages in the several occupations, also the question of delegates being allowed on any of the contractors' jobs to collect subscriptions, etc. A further objectionable feature providing that workmen shall be paid compensation for *any* loss sustained out of the penalty has been removed; the loss is now strictly confined to *loss of wages* only. It is to be regretted that the maximum sum of £500 as a penalty has not been reduced, and it is further to be regretted that the Finance Committee have not seen their way to recommend the appointment of an independent arbitrator in connection with the clauses, which really leaves the Town Council, who are parties to the contract, the sole right to decide when a breach has been committed, and they are also empowered to impose penalty for same. The Oldham and District Master Builders' Association have done their utmost to remove this objectionable view, but without avail. This information will probably be interesting to other towns.

Basis for Construction of New Fair Contracts Clause, as Adopted by the Town Council.

Payment of the Standard Rate of Wages.

1. Contractors tendering for or executing work under this Council must pay to the whole of their workpeople the standard rate of wage in the several occupations and districts in which they are engaged. The rate recognised between the Trade Unions and the Associations of Employers shall be deemed to be the standard rate.

Observance of Trade Conditions.

2. Contractors shall observe the hours of labour and conditions and customs of employment prevailing in the several trades and districts, in regard to rates for overtime, extra work, apprentices, holidays, or other established conditions.

Responsibility in Sub-Contract Cases.

3. The contractors shall not assign or sublet a contract or any part of it without the consent of the Council, and in connection with any sub-contract work the principal contractor shall be responsible for the observance of the various conditions as though the contract was being carried out by the contractor himself. The sub-contractor shall be made subject by the Council to the conditions herein stated respecting any work he has undertaken.

Availability of Information regarding Contracts.

4. A list of rates of wages paid in the several trades in connection with work for the Council shall if required be provided by Contractors who are accepting contracts and shall be available for inspection by representatives of the Workmen's Societies.

Freedom as to Trade Union Requirements.

5. Contractors or sub-contractors must recognise the freedom of their workpeople to be members of Trade Unions and concede full liberty to fulfil the usual conditions of membership provided that the duties of workmen to their employers are not thereby interfered with.

Production of Proof when Demanded.

6. Should the Council have reasonable grounds in its opinion for believing that the conditions of the contract are not being com-

plied with, the contractor shall be required to produce, without delay, adequate proof to satisfy the Council.

Penalty for Breach of Conditions and Recompense to Workmen.

7. Failure on the part of contractors to comply with any conditions set forth in this clause shall leave the Council power to cancel the contract or call upon defaulting contractors to pay to the Council any sum not exceeding £500. From any sum so obtained payments may be made to workmen to cover any loss of wages which it may be proved they have suffered by breaches of any of the conditions herein stated.

Assent to Contract, and Application to Local Authority.

8. Clauses expressing these various conditions for contractors shall be inserted in all contracts for work to be done or goods to be supplied, and contractors shall be required to signify their assent to them in writing. The provisions of this clause regarding wages, hours, and other conditions named herein shall also apply to public work done by the Council itself.—*June 2nd*, 1909.

HULL ASSOCIATION.

Hon. Secretary: A. Peers.

The monthly meeting of the Hull Association was held at the Builders' Exchange, Posterngate, on Tuesday evening, June 15th, when upwards of forty members were present, Mr. E. Quibell presiding.

Reference was made to the death, after a long and painful illness, of an old and well-respected member of the association, Mr. J. Hunter, slater, Machell Street, Hull, the members rising in sympathy. It was resolved that a letter of condolence be forwarded to the widow and family.

The need for a more convenient morning train service from Bridlington to Hull was raised. It was decided that the association petition the North Eastern Railway Co. for an earlier and faster train service during the summer months. The suggested inter-trading rules from the Yorkshire Federation were again discussed, and the decision come to that the same be not adopted, and that the present rules be adhered to.

It was resolved that the monthly meeting be discontinued during the months of July and August, unless any special business arises; the Builders' Exchange to be closed for August Bank holiday week, which is the date arranged for the week's general holiday throughout the building trades of Hull.

The annual picnic of the Association will take place on Thursday, June 24th, to Pateley, about 10 o'clock. After hot luncheon has been served at the King's Arms Hotel, the party will be conveyed in carriages to Holstein Beck. A meat tea will be partaken of at Pateley on returning from the drive. At 8.15 p.m. a start will be made for Hull.

Views and Reviews.

Italian Architecture of the Renaissance.

The Architecture of the Renaissance in Italy. A General View for the Use of Students and Others. By William J. Anderson, Architect, Associate of the Royal Institute of British Architects. Fourth edition, revised and enlarged. With seventy collotype and other plates, and one hundred and ten illustrations in the text. Large 8vo, 12s. 6d. net. London: B. T. Batsford, 94, High Holborn. 1909.

This improved edition of a successful book is sure to find wide acceptance. It has been carefully revised by Mr. Arthur Stratton, A.R.I.B.A., of King's College, London, who gratefully acknowledges "the help and advice unsparingly given by Mr. R. Phené Spiers, F.S.A." Many fresh illustrations have been added, and several of them are from drawings by Mr. Leslie Wilkinson, A.R.I.B.A., to whose artistic skill our own pages have on many occasions borne witness.

Perhaps the chief value of the book for students, as well as for those who, while not disdaining to be still classed as students, have passed beyond the state of pupilage, consists in the fact that the author threw his work into a truer perspective than that with which the more pretentious works of Fergusson and Gwilt had made us familiar. Whereas these authors dealt at disproportionate length with the later periods of the Renaissance, Mr. Anderson endeavoured to see it steadily and see it whole, devoting four-fifths of his space to the early and culminating periods, and relegating Vignola and Palladio and the Barocco school to the last chapter.

The origin and character of the Renaissance, and the part played in it by Brunelleschi—"wherever the arts of form are understood and believed, the genius of Brunelleschi will not fail of honour and renown"—are set forth in the introductory chapter with keen insight and remarkable terseness; and although the contention that the Italian Renaissance was no mere reactionary copying of good forms that had been forsaken, but was unquestionably an embodiment of the temper of the time, seems now a little too insistent and perhaps rather superfluous, it may still serve to correct some lingering misapprehensions fostered by Ruskin and Fergusson; and the observation that possibly all ages of healthy human prosperity are more or less periods of revival, when men's minds wisely turn to the contemplation of the best traditions, represents the attitude of many who see in the impatient demand for a "new style" not strength and wisdom, but their opposites. Aggressive self-assertion in art and architecture, and the excessive straining and striving after originality, can only result in futile effects; and the Renaissance, Mr. Anderson is at some pains to show, was not of this kind, any more than it was the mere fanning of the ancient embers. The energy that led to the perception and choice of the best elements of earlier work was not exhausted in this effort; rather it grew with the exercise; and originality found free scope in fresh interpretations and re-combinations in accordance with the virile and valiant spirit of the times. The masters of the Renaissance were at once exuberant and scholarly, receptive and creative; and the Renaissance itself was, in a word, a wondrous expansion of evolution, in an extraordinary season of rapid and vigorous growth and of swift flowering and fruition.

Of this prolific period the author has rendered a faithful and just account; concise but not incomplete. His mastery of the subject, and his love of it, are apparent on every page; his commendation and his adverse criticism of the sagaciously chosen examples that he examines and compares are, one feels instinctively, alike inspired by entire sincerity of conviction, which is broadly and firmly based upon the conscientious ascertainments of an acutely judicial mind. One can respect his judgments even in the surprisingly few instances in which one does not feel bound to agree with him. The student will find no sounder or safer guidance in the study of the most stupendously important period in the history of architecture. The book is well and copiously illustrated; and the pictures alone, being chosen with taste and discrimination, and including as they do all that is most profitable for contemplation (as well as one or two examples that are perhaps hardly quite worthy of the august company), are a priceless boon to the earnest student. Extremely useful addenda are a chart of the chief buildings of the Renaissance, and a select list of books relating to the subject. The book is produced in the ecellent style that is customary with the house of Batsford.

Coming Events.

Monday, June 21st—Saturday, June 26th.

Annual Congress of French Architects, Paris.

Wednesday, June 23.

Special General Meeting R.I.B.A. to consider a resolution authorising the council to purchase leases of additional premises for the Institute. 8 p.m.

Saturday, June 26th.

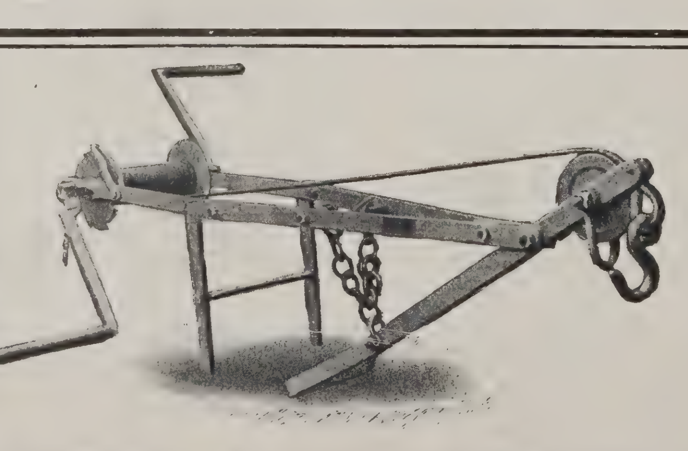
Edinburgh Architectural Association, 117, George Street.—Visit to Dunfermline, leaving Waverley at 1.20 p.m.

Wednesday, June 30th.

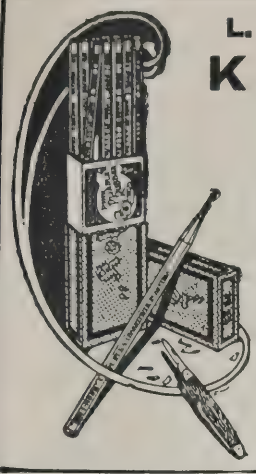
Members of the R.I.B.A. view the "Exhibition of Chosen Pictures," at the Grafton Galleries, 3 to 6 p.m., on the invitation of the hon. committee.

Monday, July 26th—Friday, July 30th.

Institution of Mechanical Engineers,—Summer Meeting, Liverpool.



A HANDY, PORTABLE
and instantly adjusted Tackle for raising and lowering
LADDERS, SCAFFOLDING MATERIALS, &c.
A valuable addition to Contractors and Builders' Plant.
SAVES TIME AND LABOUR.
Best English Make. Fitted with galvanized steel wire rope.
Price £5 5 0.
Call and see — THE AUTOMATIC FIRE ESCAPE CO., LTD., 117, QUEEN VICTORIA STREET, LONDON, E.C.



L. & C. HARDTMUTH'S

KOH-I-NOOR PENCIL

Is the most economical Pencil made. It lasts six times as long as an ordinary pencil. But it is the velvety smoothness of the lead that is the great charm of the Koh-I-Noor. There is no other pencil that nearly approaches its quality. The lead of the Koh-I-Noor is specially prepared by a perfected process which gives it a firmness yet delicacy of touch that cannot be imitated. The Koh-I-Noor is made in seventeen degrees to suit all pencil purposes.

Koh-I-Noor Pencils are **4d.** each, and **3s. 6d.** per dozen, everywhere. Of Stationers, Artists' Colourmen, Photographic Dealers, &c. Booklet free from

L. & C. HARDTMUTH,
12, Golden Lane, London, E.C.

KOH=I=NOOR

TRACING CLOTH

Is a stout and substantial cloth possessing every advantage for the drawing room. Its surface is smooth and clear, free from blotches. Does not tear or break. Is transparent enough for the finest work. Erasures may be freely made without causing the ink to run. Is excellent for giving impressions by process

THE GREATEST SATISFACTION IN USING THIS SPECIALITY IS FOUND IN ALL DRAWING OFFICES.

Of Stationers Artists' Colourmen, Photographic Dealers &c

L. & C HARDTMUTH, 12, Golden Lane, London, E C

ELECTRIC LIGHTING

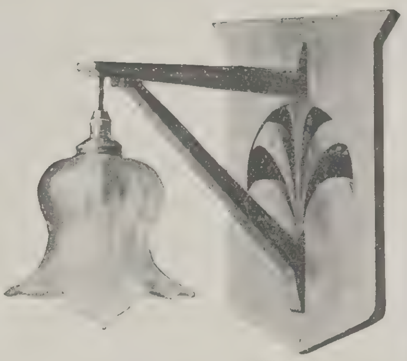
Heating,

Bells,

Telephones.

FITTINGS.

Estimates Free.



A "Tredegar" Bracket.

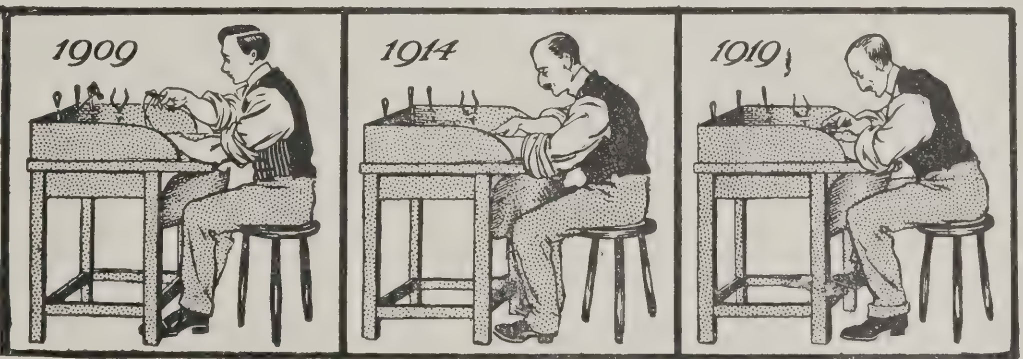
Specialists in Temporary Electric Lighting and Power during construction of Buildings. ∴ We installed and maintained Electric Lighting and Power during the construction of the Baker Street & Waterloo Railway, the Piccadilly Hotel, etc.

TREDEGAR & CO.

HEAD OFFICE—56, Victoria Street, London, S.W.
BRANCH—St. Albans.
WORKS—Tredegar Works, Bow, E.

Telephone: WESTMINSTER 5907.

Don't let it be "the same old grind."



5 years — 10 years — 15 years hence.

The man who is content just to go on "waiting" for advancement, "wishing" for a more congenial position, "hoping" for more money, finds himself still at the same old job at the same low pay as the years roll over his head—unless, indeed, he finds himself displaced altogether!

Don't let this hopeless record be yours. You have ambition—give rein to it.

Get the training which will promptly fit you for a better post

and secure you successive advances as the years pass on. It's not a difficult matter to get this training. The International Correspondence Schools will bring it to you in your own home, in your spare time, and on terms to suit your pocket. This institution was founded 18 years ago for the express purpose of enabling ambitious men to improve their prospects. Its record is a brilliant one. As typical of our students' successes, read the following:—

"Edinburgh.

Before enrolling in the I.C.S. I held a very humble position of junior fitter in the...........Branch of the...........Company. I was advised to take up your course in Telephone Engineering. I commenced studying at night from 6 till 10 p.m. although employed during the day. In six months I completed the course. I was placed in a responsible position on the new switch board without delay. Within a few weeks I was given the position of Assistant Traffic Superintendent, with the promise of rapid promotion. (Signed) J. A. J. HAY."

Send for particulars of our training, also of the

Free assistance in the matter of employment

rendered by our "Students' Aid Department," which is in touch with employers in every district, and furnishes I.C.S. students with introductions, recommendations, etc.

Mark the coupon or write us about any special career which interests you—NOW.

Residents of the following Countries should address the respective I.C.S. Branches:—

CANADA—Toronto.
INDIA—Fort, Bombay.
SOUTH AFRICA—Cape Town.
NEW ZEALAND—Wellington.
AUSTRALIA—Sydney.
ITALY—Naples.
CHINA.—Shanghai.
P.I.—Manila.
HONOLULU—Honolulu.
PANAMA—Ancon.
BERMUDA—Hamilton.
STRAITS SETTLEMENTS—Singapore.
PORTO RICO—San Juan.
JAMAICA—Kingston.
MEXICO—Mexico D.F.
ARGENTINE REPUBLIC—Buenos Aires

Registrar, INTERNATIONAL CORRESPONDENCE SCHOOLS, Ltd., 88
(Dept. B·), International Buildings, Kingsway, London, W.C. And at Manchester, Birmingham & Glasgow.

I am interested in your System of Technical Training and desire to increase my earning power. Please send me, post paid free of charge, the Book covering the subject before which I have marked **X** on the Coupon, and full information showing how I can succeed in same.

Mechanical Engineering.
Architecture.
Electrical Engineering.
Structural Engineering.
Civil Service.
Book-Keeping and Business Training.
Gas Engineering.
Machine Shop Practice.
Sanitary Engineering.
Textiles.
Civil Engineering.
Analytical Chemistry.
Mining Engineering
Steam Engineering.

PREPARATION FOR EXAMINATIONS.

Name..
Street..
Town.................... Occupation....................

23/6 09

Publishers' Notices.

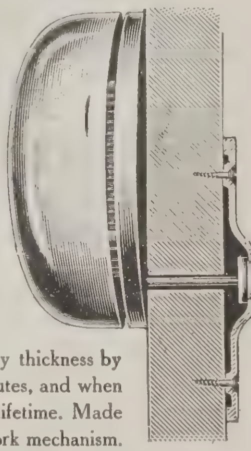
Offices : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—Caxton House, Westminster. PUBLISHING—6, Great New Street, Fetter Lane, E.C.
Telegraphic Address : "Buildable, London."
Telephones : ADVERTISEMENT, EDITORIAL AND COUNTING HOUSE—817 Gerrard. PUBLISHING—2200 Holborn (six lines).

New-Departure Door Bells.

Cheaper and better than electric bells. No wiring or batteries to attend to. Can be fixed to a door of any thickness by anyone in a few minutes, and when once attached will last a lifetime. Made with rotary or clockwork mechanism. Door plates furnished in various styles and finishes.

Sold by all Ironmongers and Builders' Merchants. In case of difficulty in obtaining supplies, please communicate with

JOHN H. GRAHAM & CO.,
118-122, Holborn, LONDON.



Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, BUILDERS' JOURNAL, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Bolton (Lancs.).—For erection and fitting up of St. Philip's Church, Bolton. Mr. E. H. Lingen Barker, architect :—

Hodgekiss, Farnworth	£5,509	0	0
Townson and Sons, Bolton	5,000	0	0
Dickinson, Bolton	4,789	10	0
Thorpe and Son, Manchester	4,406	0	0
Hatch and Son, Lancaster	4,242	0	0
Tyson, Bolton	4,159	10	0
Maginnis Bros., Bolton	4,158	0	0
Clayton Bros., Stockport	4,083	0	0
Ridyard, Ashton-under-Lyne	4,005	0	0
Greenhalgh and Co., Warrington	3,958	0	0
Gerrard and Sons, Swinton	3,930	0	0

Buckley (Chester).—For erection of a new isolation hospital to be built on a piece of land at Dob's Hill, near Buckley, for the Hawarden Rural District Council. Messrs. John H. Davies and Sons, architects, 14, Newgate Street, Chester.

P. Edwards, Dodleston	£3,126	0	0
E. O. Probert, Hope	2,943	18	8
W. Tomkinson and Sons, Liverpool	2,939	0	0
H. Kelley and Co., Liverpool	2,922	0	0
G. Wright and Sons, Hawarden	2,838	18	4
E. Blane and Son, Connah's Quay	2,772	5	6
R. Williams, Brymbo	2,750	19	10
Pryce Williams, Overton-on-Dee	2,748	17	2
D. H. Roberts,* Hope	2,477	1	10

*Accepted provisionally.

Colwall (Malvern).—For new church at Upper Colwall.

Porter, Malvern Wells	£2,677
Stokes	2,675
Bowers, Hereford	2,500
Wilesmith, Malvern Link	2,492
Wood and Son	2,384
Brazier	2,365
Collins and Godfrey	2,360
W. James, Upper Colwall	2,247
T. Broad, Ltd.,* Malvern	2,201

*Accepted.

Coventry.—For erection of proposed out-patients' department at the Coventry and Warwickshire Hospital. Messrs. A. Hessell Tiltman, F.R.I.B.A., 2, Verulam Buildings, Gray's Inn, London, W.C., and Herbert W. Chattaway, Trinity Churchyard, Coventry, architects.

H. Willcock and Co., Wolverhampton	£3,325	0	0
E. Green, Northampton	3,252	0	0
J. Parnell and Son, Rugby	3,239	15	0
Kelley and Son, Foleshill, Coventry	3,269	4	11
A. J. Lord, Wolston	3,191	19	3
Bosworth & Lowe, Nottingham	3,103	2	9
T. Elvins, Birmingham	3,142	0	0
Beardsmore and West, Northampton	3,085	10	0
W. Pattinson and Sons, Ltd., London, S.W.	3,039	0	0
T. Hickman, Market Harborough, near Leicester	3,025	2	8
W. Moss and Sons, Ltd.,* Lough	3,013	7	4
T. Higgs, Northampton	3,004	4	8
R. P. Gathercole, Leamington	2,964	2	7

*Accepted.

Hereford.—For the erection of St. Nicholas Rectory, for the Rector and Churchwardens of St. Nicholas. Messrs. Nicholson and Hartree, architects, Offa Street, Hereford. Quantities by Messrs. H. H. Barber and Son, 22, Buckingham Street, Adelphi, W.C.

Bowers and Co.	£1,505	8	0
C. Cooke	1,482	10	0
Beavan and Hodges	1,479	10	0
W. Powell	1,359	0	0
W. P. Lewis and Co.	1,348	5	0
E. W. Wilks	1,271	15	0
R. Preece*	1,216	0	0

All of Hereford.

*Accepted.

Torquay.—For erection of new wing at Torquay Hydropathic. Messrs. Waymouth, Johnson, and Webber, architects, Tormohan Manor House, Torquay.—Quantities by the architect :—

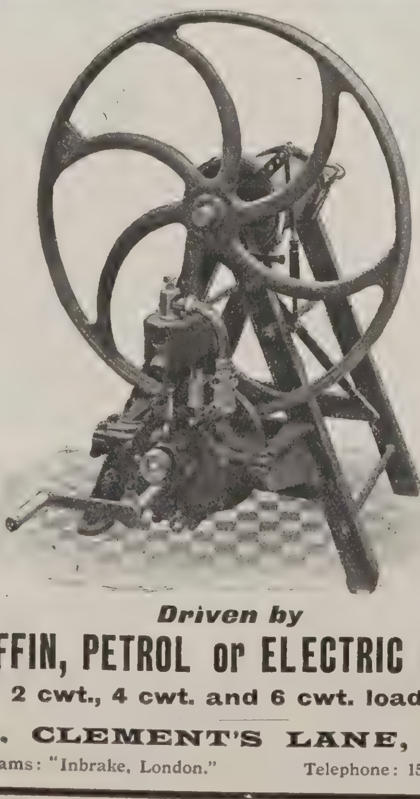
S. Blatchford	£6,251
Parker Bros.	5,918
W. Watson and Son	5,770
H. Phare	5,719
H. C. Jackman	5,700
R. F. Yeo and Sons	5,466
E. P. Bovey and Son,* Torquay	5,293
R. E. Narracott	5,078

*Accepted.

(*Tenders continued on page viii.*)

BROOM & WADE,
ENGINEERS, LTD.,
HIGH WYCOMBE.
POWER HOISTS for BUILDERS.

Always Ready for Use.
No Skilled Attention Required.



Driven by
PARAFFIN, PETROL or ELECTRIC MOTORS
2 cwt., 4 cwt. and 6 cwt. loads.
27. CLEMENT'S LANE, E.C.
Telegrams: "Inbrake, London." Telephone: 15133 Central.

The BUTTERMERE GREEN SLATE Co., LTD.
KESWICK, Cumberland.

Supply the finest *Cumberland & Westmorland GREEN SLATES* from their Celebrated—

Honister and Yew Crags Quarries, Cumberland.
Original Elterwater Green Quarries, Elterwater.
Coniston Green Slate Quarries, Tilberthwaite.
Lingmoor Quarries and Highfellside Quarries.

In the following colours:—
LIGHT SEA GREEN,
DARK SEA GREEN,
OLIVE GREEN,
and other Shades.

WESTMORLAND GREEN SLATES.

Manufacturers of Green Stonework for Flooring Tiles, Flagging, Heads, Sills, Mullions, Steps, Memorials, and other Architectural specifications.

Write for Prices, Samples and other particulars with List of Roofs covered to
Head Office—
KESWICK,
CUMBERLAND.
Telegrams—"Buttermere Slate, Keswick."
or to
52, QUEEN VICTORIA ST., LONDON, E.C.
Telegrams—"Khoro, London." Telephone—8206 Bank.

Laying Lattice for Floors, Transvaal University, Johannesburg, S.A.

JOHNSON'S STEEL WIRE LATTICE SYSTEM OF REINFORCED CONCRETE.

Simplicity in construction, combined with great efficiency and . saving . of material and labour.

Telegrams: "Metallicus."
Telephone 6437.

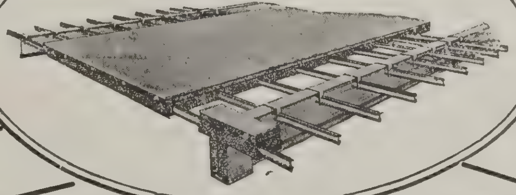
R. JOHNSON, CLAPHAM & MORRIS, LTD., Reinforcement Dept., 24, Lever Street, MANCHESTER.

COLUMBIAN FIREPROOFING Co., LTD.

Reinforced Concrete Floors.

RITZ HOTEL, PICCADILLY.
WARING'S, OXFORD ST., W.
ROYAL INFIRMARY, GLASGOW.
"MORNING POST," STRAND.
LAMBETH DISTILLERY.
50 Repeat Orders for L. C. M. BANKS.

ECONOMICAL CONSTRUCTION.
RIGID AND SOUNDPROOF.
SAVING IN COST.
OWNERS & ARCHITECTS ENTIRELY SATISFIED.
SEND FOR PARTICULARS.



"COLUMBIAN" System.

37, KING WILLIAM STREET, LONDON, E.C.

A.W.E.

TEL. No. 5060 BANK.

(Tenders continued from page vi.)

Hove (Sussex).—Accepted for enlarging the administration block, constructing porter's lodge, water tower, and destructor, forming paths, laying drains, and other work at the Infectious Diseases Hospital at Portslade. Mr. Hugh Hamilton Scott, borough surveyor.

Peerless, Dennis and Co., Langney Road, Eastbourne, £5,236.

London, S.E.—For alterations to the Police Section House at Kennington Lane, London. Mr. J. Dixon Butler, F.R.I.B.A., surveyor to the Metropolitan Police, New Scotland Yard, S.W. Quantities by Messrs. Thurgood, Son and Chidgey, 8, Adelphi Terrace, Strand, W.C.

Mowlem and Co., Ltd.	£2,200
F. G. Minter	2,051
Lorden and Son	1,975
Holloway Bros.	1,975
F. and H. F. Higgs	1,960
Appleby and Son	1,909
C. Ansell	1,900
W. Smith and Son	1,895
Rice and Son	1,851
W. Eyre	1,850
Higgs and Hill, Ltd.	1,774
Prestige and Co.	1,711

London.—For a new school, Fairclough Street, St. George-in-the-East, for the London County Council.

G. Parker and Sons, Peckham	£19,582	0	0
F. & H. F. Higgs, Herne Hill	18,691	0	0
D. W. Davies, Cardiff	18,651	7	6
W. Smith and Son, Eldon Works, Harleyford Road	17,969	0	0
J. Garrett and Son, 83, Balham Hill	17,571	0	0
C. Wall, Ltd., 4, Lloyd's Avenue	17,487	2	8
Kirk and Randall, Warren Lane Works, Woolwich	17,480	0	0
H. L. Holloway, Deptford	17,450	0	0
J. Carmichael, Wandsworth	17,263	0	0
J. Appleby and Sons, Cornwall Works, Southwark Park	17,187	0	0
T. D. Leng, Evelyn Street, Deptford	17,006	0	0
Perry and Co. (Bow), Ltd., Tredegar Works, Bow	16,824	0	0
J. and C. Bowyer, Ltd., Upper Norwood	16,796	0	0
H. Lovatt, Ltd., Wolverhampton	16,757	10	0
J. and M. Patrick, Wandsworth	16,730	0	0
Thomas and Edge, Woolwich	16,596	0	0
F. and T. Thorne, Isle of Dogs	16,543	0	0
G. E. Wallis and Sons, Ltd., 1, Albemarle Street	16,332	0	0
J. Marsland and Sons, Walworth	16,198	0	0
E. Lawrance and Sons, Wharf Road, City Road	16,030	0	0
Holliday and Greenwood, Ltd.,* Brixton	15,991	15	9

Architect's (Education) estimate, £17,095.

*Recommended for acceptance.

London.—For erection of school at Lauriston Road, Hackney, for the London County Council.

C. R. Price, 139, Bishopsgate Street Without	£9,009	0	0
McLaughlin and Harvey, Ltd., 13, Brecknock Road	8,816	15	10
W. Johnson and Co., Ltd., Wandsworth Common	8,814	0	0
W. Harris, North Woolwich	8,708	0	0
W. M. Dabbs and Son, Rookwood Road, Stamford Hill	8,649	0	0
McCormick and Sons, Northampton Street, Essex Road	8,587	0	0
Perry and Co. (Bow), Ltd., Tredegar Works, Bow	8,485	0	0
C. P. Roberts and Co., Highbury	8,471	0	0
T. D. Leng, Deptford	8,372	0	0
F. and T. Thorne, Isle of Dogs	8,366	0	0
E. Lawrance and Sons, Wharf Road, City Road	8,287	0	0
W. Shurmur and Sons, Ltd., Upper Clapton	8,217	0	0
Galbraith Bros., Ltd.,* 46, Camberwell Green	8,140	16	0

*Recommended for acceptance.

Solihull (Warwickshire).—For steam, hot and cold water supplies, and steam heating apparatus, for the Guardians of the Poor of the Solihull Union. Messrs. W. H. Ward, architects, Paradise Street, Birmingham.

Rosser and Russell, Birmingham	£415	0	0
Henry Hope and Sons, Ltd., Birmingham	375	0	0
Reynolds and Co., Birmingham	365	0	0
William Southall, Junr., Birmingham	365	0	0
James Stott and Co., Birmingham	347	2	6
Moorwood, Sons and Co., Sheffield	319	0	0
Parker, Winder and Achurch, Birmingham	300	0	0
Griffin Ironworks Co., Ltd., Birmingham	296	2	6
G. N. Haden and Sons, Birmingham	293	0	0
Thomas Taylor, Birmingham	280	0	0
Brightside Foundry Co., Ltd.,* Birmingham	272	0	0

*Accepted.

Tiree.—For the erection of Gott Bay Pier. G. Woulfe Brenan, M.I.C.E., engineer, Oban.

1. Whole Works.

John Cochrane and Son, London (without road)	£19,109	8	8
R. B. Neal, Ltd., Plymouth	18989	5	9
Playfair and Toole, Southampton (without road)	18,020	14	5
Yorkshire Hennebique Co., Leeds (without road)	14,277	3	1
J. Adam and Co., Glasgow	11,594	4	3
Kinnear Moodie and Co., Glasgow (recommended for acceptance)	11,000	0	0
R. C. Brebner, Edinburgh	9,715	12	0

2. Breakwater and slip only.

E. and D. Stewart, Kinlochiel	7,904	18	7
T. Munro, Wick	7,791	5	7
T. Topping, Edinburgh (with road)	7,090	8	7
J. Adam and Co., Glasgow	6,300	15	0

3. Reinforced concrete work only.

R. Thorburn and Son, Edinburgh	5,889	4	1
E. Nuttall and Co., Manchester (incomplete)	4,641	12	6
Yorkshire Hennebique Co., Leeds	5,750	12	8

4. Road and fencing only.

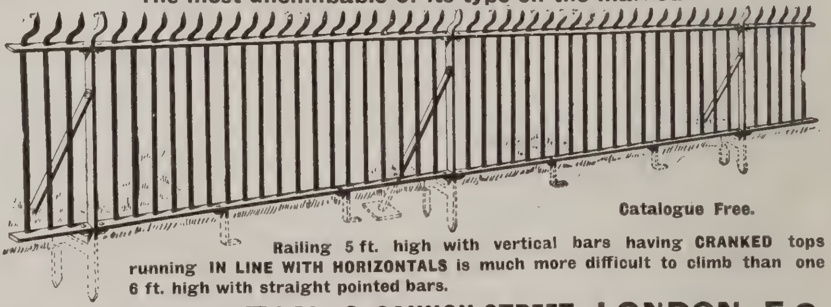
Alexander MacKechnie, Tiree	326	0	0
Alexander MacArthur, Tiree	301	15	0
Donald MacDougall, Tiree	291	12	6
Malcolm MacDonald, Tiree	250	0	0

Wirral (Cheshire).—Accepted for erection of sanatorium, for the Wirral Board of Guardians.

W. Fleming and Co., Neston, £903.

ROOFING SLATES.
Velinheli, Penrhyn and Westmoreland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

LAUNDRY
and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE.
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.



BAYLISS, JONES & BAYLISS LTD.,
THE "CRANKED BAR" RAILING.
The most unclimbable of its type on the market.
Catalogue Free.
Railing 5 ft. high with vertical bars having CRANKED tops running IN LINE WITH HORIZONTALS is much more difficult to climb than one 6 ft. high with straight pointed bars.
WOLVERHAMPTON, & CANNON STREET, LONDON, E.C.

WILLESDEN UNDERLINING PAPER
FOR ALL CLIMATES. WATER-PROOF, ROT-PROOF, INSECT-PROOF.
For Underlining Slates, Tiles, Iron Buildings, with or without Boards. For laying on joists. Placed under Floor Boards excludes damp and deadens sound. Also for damp walls.
WILLESDEN PAPER AND CANVAS WORKS, LTD., WILLESDEN JUNCTION, LONDON, N.W. Established 1870.

PROMPT DELIVERY REPRESENTATIVES SENT TO ANY PART
TELEPHONE Nos 9492 Central
MEASURES BROS LTD 53B SOUTHWARK ST LONDON.S.E. & PITLAKE, CROYDON.
TELEPHONE No 171 CROYDON.
10,500 TONS OF SIEMENS MARTIN ENGLISH & BESSEMER STEEL JOISTS 3" TO 20" DEEP ALWAYS IN STOCK.
SECTION SHEETS, BOOKS & PRICES ON APPLICATION.
CHEQUERED & PLAIN PLATES & SHEETS. CASTINGS OF EVERY DESCRIPTION.
STEEL SHAFTING, from 2½ in. to 8 in. diameter and up to 36 feet long, always kept in stock.

For Architects, Builders and Engineers.

TRUE TO SCALE.

BLACK LINE PRINTS.

Permanent. *Done on any Paper or Cloth.*

R's Method of Perspective

WRITE FOR PARTICULARS.

W. F. STANLEY & CO., LTD.,

13, Railway Approach, London Bridge.

Tel. 371 Hop. Telegrams. "TRIBRACH, LONDON.

"THE" LIFT & HOIST CO.,

Also Revolving Shutters,
Iron Doors and Iron
Fire-Escape Stairs,

Premier Ironworks,
DEPTFORD, S.E.

"AQUABAR"

WATERPROOFING COMPOUND
For Cement and Concrete.

Easiest to use, most
economical, reliable
and satisfactory.

C. S. TAPLIN & Co.,
MOORGATE STATION CHAMBERS,
LONDON, E.C.

THE STRAND
DRAWING OFFICE
PERSPECTIVES
WORKING DRAWINGS.
DRAWINGS FROM SKETCH PLANS.
DESIGNS TO A CUBED COST.
ASSISTANCE IN COMPETITIONS.
MODELS.
TRACINGS.

R. CHARLES HALL,
Gladstone House,
188, Strand,
LONDON, W.C.
Telephone: No. 5553 Central (P.O.).

THATCHING AND REED LAYING.

J. G. COWELL, SOHAM.

"The Architectural Review." A Magazine of Architecture and Arts of Design. Edited by MERVYN E. MACARTNEY, B.A., F.R.I.B.A., F.S.A. Price 1/- Monthly. Annual Subscription 16/- post free.

Technical Journals, Ltd., Caxton House, Westminster.

"SCHOLA" HOOK (Regd.)

FOR CLOAK ROOMS.

Over 300 Schools, etc.
fitted with 250,000 Hooks.

Lists and Estimates Free. Fortnightly advt.

SOLE MAKERS:

BROOKES & Co., Ltd., 4, Cateaton St.,
Also GATES, &c. **MANCHESTER.**

THE WOULDHAM CEMENT Co. Ld.

RED CROSS BRAND.

RED CROSS BRAND
is the highest quality of
PORTLAND CEMENT.

quick medium or slow setting.

Established 1855.

Output, Lion Works, Grays. 3,000 tons weekly.

35, GREAT St. HELENS, E.C.

Telephone
No. 1846 Avenue

Telegrams
Enriching, London

HOSPITALS, INFIRMARIES, SCHOOLS, &c., REQUIRE

MANCHESTER STOVES, GRATES, & VENTILATORS.

E. H. SHORLAND & BRO., DRAKE STREET WORKS, MANCHESTER.

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about **five days** after the date of this issue.

Unless expressly stated to the contrary, all deposits required for bills of quantities, etc., are returned on receipt of *bona-fide* tenders.

The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the contract, which requires them to pay the rates of wages current in the district.

BUILDING.

June 23—July 5. **GREAT YARMOUTH.**—Erection of a new children's ward at the General Hospital, for the Committee. Builders desirous of tendering should send their names, together with postal order or cheque for £1, to Olley and Haward, architects, 5, Queen Street, Great Yarmouth, by first date above. Tenders are to be sent to R. F. E. Ferrier, Hon. Secretary, 33, Hall Plain, Great Yarmouth.

June 24. **WIMBLEDON, SURREY.**—Extension of the technical institute at Wimbledon, for the Surrey Education Committee. Drawings and conditions of contract may be seen on application to the Architests, Jarvis and Richards, 10, Queen Anne's Gate, Westminster, S.W. Names to sent to the Secretary, Surrey Education Committee, County Education Office, Kingston-upon-Thames, together with deposit of £2 2s.

June 25. **MANCHESTER.**—Construction of a battery house at Dickinson Street generating station, for the Corporation. Forms of tender, etc., of F. E. Hughes, Secretary, Electricity Department, Town Hall, Manchester, on deposit of £2 2s. Tenders to the Chairman of the Electricity Committee, Town Hall.

June 25. **LONDON.**—Erection of a bandstand, composed of wood and tiles, at Boundary Street Garden, Bethnal Green, for the L.C.C. Drawing and specification, form of tender, and other particulars, at the architect's department, 19, Charing Cross Road, W.C., upon deposit of 10s. with the cashier of the Council, at the County Hall, Spring Gardens, S.W. Tenders to be delivered at the County Hall, addressed to the Clerk of the L.C.C., Spring Gardens, S.W. Fair wages clause.

June 25. **ORMSIDE (near APPLEBY).**—Erection of an additional block, 97ft. in length, consisting of two wards with kitchen and nurses' room, lavatories, bath, w.c., etc., in connection with the Joint Infectious Hospital at Ormside. The building will be constructed of match boarding on brick foundations, and will be covered with corrugated iron. Plans and specifications by appointment of the borough surveyor, Appleby. Tenders to be delivered to Wm. Hewitson, clerk to Joint Hospital Committee, Appleby.

June 26. **CULGAITH.**—Erection of a new classroom at the Culgaith School. Plans and specifications, at the Vicarage, Culgaith, or at the offices of the architect, Jos. Graham, Castle Street, Carlisle.

June 26. **PENSNETT (near DUDLEY).**—Erection and completion of a new Council school for 250 children, and a cookery-room, at Pensnett, for the Staffordshire Education Committee. Persons desirous of tendering should apply to Graham Balfour, Director of Education, County Education Offices, Stafford, enclosing deposit of £1 1s., when quantities will be supplied.

June 26—July 1. **LONDON.**—Repairs and decorative work at the Infirmary, Lower Road, Rotherhithe, S.E., for the Guardians of the Parish of Bermondsey. Specification of A. H. Newman. F.R.I.B.A. Forms of tender, specification, and bills of quantities, etc., of E. Pitts Fenton, Clerk, 283, Tooley Street, S.E., to whom tenders are to be sent. £10 deposit (Bank of England Note) required.

June 28. SHARLSTON.—Erection of a central Sunday school, near S. Luke's Church, Sharlston; drawings and specifications may be seen at S. Luke's Lodge, Sharlston, near Wakefield, on deposit of £1.

June 28. **COTHERSTONE.**—Additions and alterations to St. Cuthbert's Grove, Cotherstone. Plans and particulars can be seen with Wm. Kidd, Red Lion Hotel, Cotherstone. Tenders to be sent to E. Stephenson, 14, North Lodge Terrace, Darlington.

June 28. **LLANFYNYDD.**—Execution of structural alterations to the Council School for the Flintshire Education Committee. Plans and specifications may be seen on application to Samuel Evans, County Surveyor, Mold. Tenders are to be sent to Fred. Llewellyn-Jones, Secretary, Mold.

June 28. **PENARTH.**—Re-erection of the tower at the public baths for the U.D.C. Plans and specification, etc., of the Architect, H. Snell, 13, Hickman Road, Penarth, on deposit of £1 1s. Tenders to be sent to J. W. Morris, Clerk to the Council, District Council Offices, Penarth.

June 28. **DORCHESTER.**—Repairs at the following schools, for the Dorset Education Committee:—Bothenhampton, Buckhorn Weston, Caundle Stourton, Charmouth, Gillingham, Handley, Lytchett Matravers, Lytchett Minster, Stour Provost, Stratton, Swyre, Yetminster. Tenders to be sent to the Secretary, County Education Office, Dorchester.

June 28. **DROXFORD (HANTS.).**—Taking up a stone floor and replacing same with wood, and certain other repairs, painting, etc., at the Droxford Workhouse, for the Guardians of the Union. Specifications may be had from the Clerk, or at the Workhouse, Droxford. Tenders to be delivered to Godfrey Pearson, Clerk, Bishop's Waltham.

June 28. **NORTHOP HALL (near NORTHOP).**—Reconstruction (after fire) of the Council School, for the Flintshire Education Committee. Plans and specifications can be obtained on application to Samuel Evans, County Surveyor, Mold, on deposit of £2 2s. Tenders to be sent to Fred. Llewellyn-Jones, Secretary, Mold.

June 28. **GREENFIELD (near HOLYWELL).**—Erection of a new Council School, to accommodate 350 children, at Greenfield, for the Flintshire Education Committee. Plans and specifications at the offices of Samuel Evans, County Surveyor, Mold, on deposit of £2 2s. Tenders to be sent to Fred. Llewellyn Jones, Secretary, Mold.

June 28. **BIGGLESWADE.**—Erection of a block of Church of England schools, Biggleswade, for the Foundation Managers. Bills of quantities and form of tender may be obtained of Thomas Cockrill, A.M.Inst.C.E., Architect, Market Square, Biggleswade, on deposit of £2 2s. Drawings, specifications and conditions of contract, may be inspected at the office of the Architect. Tenders must be delivered to P. A. Smith, Secretary to Building Committee, "Elmhurst," Drove Road, Biggleswade.

June 28. **GLASGOW.**—Execution of works:—1, digger, mason, brick, and steel; 2, carpenter, joiner, glazier, and ironmonger; 3, plumber; 4, plaster; 5, tile and marble; in connection with Glasgow Royal Infirmary reconstruction. Drawings at the office of the architect, James Miller, A.R.S.A., 15, Blythswood Square. Copies of schedules on deposit of £1 1s. with Peter Rintoul, secretary, 212, West George Street, Glasgow.

June 28. **SOUTHAMPTON.**—Execution of:—(1) erection of a small brick bridge at Ashley, between Lymington and Christchurch; (2) strengthening a small three-span bridge at Hartley Row, known as Hartford Bridge; (3) strengthening a small two-arched bridge, known as Lea Farm Bridge, near Bramshill, for the C.C. Plans and specifications and all other information on application at the office of W. J. Taylor, County Surveyor, The Castle, Winchester. A deposit of £2 2s. will be required for a copy of the plan and specification of each contract, to be made by cheque, payable to the Hants County Council and crossed Bank of England. Tenders to be sent to H. Barber, Clerk to the County Council, The Castle, Winchester.

June 28—July 9. **NORWICH.**—Execution of improvements to the Stow Bridge School, for the Norfolk Education Committee. Names of persons desirous of tendering should be sent to Thos. A. Cox, Secretary, Shirehall, Norwich, with whom a deposit of £1 1s. is to be lodged, and to whose offices tenders are to be sent.

June 28—July 12. **SWINDON.**—Internal and External renovations to Crickdale, Old Swindon, and new Swindon Police Stations, for the Standing Joint Committee of the Wilts County Council. Specifications and forms of tender can be obtained of J. George Powell, County Architect and Surveyor, County Surveyor's Office, County Offices, Trowbridge, to whom tenders are to be sent.

June 29. REDGRAVE.—Enlargement of the school for the managers. Plans and specifications of the Rector, Redgrave.

June 29. **MALMESBURY.**—Erection of additional cloak-room and lavatory accommodation at the Secondary School, Malmesbury, for the Governors. Plans and specifications may be seen with G. F. V. Fenton, Clerk, Gloucester Road, Malmesbury, to whom tenders are to be sent.

June 29. **BIRMINGHAM.**—Supply and erection of platform roof covering at Moor Street Station, Birmingham, for the Great Western Railway. Plans and specification and forms of tender and bills of quantities at the office of the New Works Engineer, at Paddington. Tenders to be sent to G. K. Mills, Secretary, Paddington Station, London.

June 29. **PLAISTOW, E.**—Erection of a new ward block in Upper Road, Plaistow, E., for the Trustees of the St. Mary's Hospital for Women and Children. Bills of quantities, etc., up to June 19, of the Trustees' Architect, A. Saxon Snell, F.R.I.B.A., 22, Southampton Buildings, Chancery Lane, W.C., and deposit of £10 Bank of England note. Tenders to be sent to Percy J. Glenton, Secretary to the Hospital.

June 29. **LOWESTOFT.**—Erection and completion of an additional ward pavilion and for addition to the administrative block at the Sanatorium, Rotterdam Road, for the Urban Sanitary Authority. Plans, etc., at the office of G. H. Hamby, A.M.I.C.E., Borough Surveyor, Town Hall, Lowestoft, on deposit of £2 2s. Tenders, addressed to the Chairman of the Sanitary Committee, to be sent to the Borough Surveyor.

June 29. **WHITEHAVEN.**—Various works in alterations and additions to the old Infirmary at the Workhouse, Whitehaven, for the Guardians of the Poor of the Union. Drawings, specifications, and conditions may be inspected at the office of George Boyd, C.E., 33, Queen Street, Whitehaven, from whom form of tender and schedule of quantities may be obtained on deposit of 5s. Tenders to be sent to Wm. Henry Atkinson, Clerk, Union Hall, Whitehaven.

June 29. **CROYDON.**—Execution of (a) builders' work in the erection of engine and boiler-houses, two cottages, etc., at the Waddon Well (Contract No. 5). (b) Smith and ironfounder's work necessary in the erection of a steel roof, etc., in the pumping station, at the Waddon Well (Contract No. 6). Plans and specifications, and general and special conditions, bills of quantities, and form of tender, of Geo. F. Carter, M.Inst.C.E., Borough Engineer, Town Hall, Croydon, upon deposit of £1 1s., which will be returned upon receipt of a bona-fide tender. Tenders to be sent to F. C. Lloyd, Town Clerk, Town Hall, Croydon.

June 29—July 20. **EAST HAM.**—Erection of school buildings, to accommodate 1,032 children, at Vicarage Lane, East Ham, for the Corporation. Deposit of £50 Bank of England note or crossed cheque required. Plans and specifications, etc., of the Committee's Architect, R. L. Curtis, 11 and 12, Finsbury Square, London, E.C. Tenders to be sent to H. C. Padgett, Secretary, Education Offices, East Ham, E. Fair wages clause.

June 30. **SKEWEN.**—Erection of two shops at New Road, Skewen. Applications should be made to Richard Thomas, Miner's Arms, Skewen.

June 30. **CHOPWELL.**—Erection of five shops at Chopwell for M. F. Rupp. Plans, etc., may be seen at office of D. M. Spence, architect and surveyor, Shotley Bridge.

June 30. **AMMANFORD.**—Erection of a new church at Ammanford, to seat 600 people. Names of persons desirous of tendering should be sent to W. D. Jenkins, F.S.I., A.R.I.B.A., Architect, Llandilo, S. Wales.

June 30. **MALDON (ESSEX).**—Structural alterations and repairs at the Steeple Council Schools, for the Education Committee. Specification and further particulars of F. H. Bright, Clerk, Maldon D.S.C., 53, High Street, Maldon, to whom tenders are to be sent.

June 30. **LLANELLY.**—Erection of two villas at the Tumble. Plans and specifications may be inspected at the office of Wm. Griffiths, F.S.I., architect, Falcon Chambers, Llanelly, to whom tenders are to be sent.

June 30. **SALTASH (CORNWALL).**—Converting the space under the Guildhall, Saltash, into two committee-rooms, for the Corporation. Plan and specification may be seen at the Borough Surveyor's Office. Tenders to be sent to Fred. Et. Cleverton, Town Clerk.

June 30. **WREXHAM.**—Alterations to shop front at the Butchers' Market, for the Corporation. Plan and specification, and form of tender on application to John England, Borough Engineer, Willow Road. Tenders to be delivered to Lawson Taylor, Town Clerk, Guildhall, Wrexham.

June 30. **GOREY.**—Erection of new National Schools, Gorey, Co. Wexford. Plans, etc., prepared by Geo. L. O'Connor, M.R.I.A.I., architect 42b, Great Brunswick Street, Dublin. Bills of quantities prepared by D. W. Morris and Co., 68 Harcourt Street, Dublin, and can be obtained on deposit of £1.

June 30. **CAHIRCIVEEN.**—Erection of a Carnegie Free Library at Cahirciveen, for the Public Libraries Committee. Plans, etc., prepared by Doolin and Butler, Architects, Dawson Chambers, Dublin, may be inspected at the office of Thos. C. Fitzgerald, Clerk of Library Committee, Cahirciveen.

June 30. **MARYPORT.**—Various works in the erection of 15 workmen's cottages; two at Crofton, four at Brayton, one at Mealsgate, four at Aspatria, three at Bullgill, and one at Dearham Bridge, for the Maryport and Carlisle Railway. Plans and specification of the Engineer of the Company, Maryport Station. Tenders to be sent to Thomas Blain, Secretary, Maryport.

June 30. **BLACKWOOD.**—Erection of thirty houses for the Park View Building Club, Blackwood. Plans and specifications at the office of the Architect, or at the office of the Secretary, Joseph E. Davies, 11, Bloomfield Terrace, Blackwood. Tenders to be delivered to Alan H. Davies, M.S.A., Architect and Surveyor, Dock Street, Newport, Mon.

June 30. **BARNET.**—Erection and completion of a new County Council school at Barnet; accommodation, 456. Drawings, specification, etc., at the County Surveyor's Office, Hatfield. Schedule of works (quantities) and form of tender at the County Surveyor's office, upon deposit of £2 2s. Tenders must be delivered to Urban A. Smith, County Surveyor, County Surveyor's Office, Hatfield.

June 30. **WEMBLEY.**—Extension of the Public Offices, Harrow Road, Wembley, including the erection of a fire station, for the U.D.C. Plans and specifications of Cecil R. W. Chapman, Surveyor to the Council, Public Offices, Wembley. Copies of the quantities, with forms of tender, may be obtained on deposit of £2 2s. with Fredk. W. Rodd, Clerk to the Council, Public Offices, Wembley, to whom tenders are to be sent.

June 30. **SOUTHEND-ON-SEA.** — Alterations and additions to the boys' and girls' departments of Southchurch Hall Council School, for the Education Committee. Specification and plan can be seen, and form of tender obtained at the office of Burles and Harris, Architects, Clarence Street. Tenders must be delivered to J. W. Barrow, Clerk to the Committee, Education Office, Municipal Buildings.

June 30. **LETTERKENNY, CO. DONEGAL.**—Erection of entrance gates and railings, swimming bath, and laundry at the College of St. Eunan, Letterkenny, Co. Donegal. Plans and specification can be seen at the college and at the office of Thomas F. McNamara, Architect, 50, Dawson Street, Dublin. Bills of qantities can be obtained from the Surveyor, J. Mackey, 58, Dame Street, Dublin. Tenders to be sent to the Most Rev. Dr. O'Donnell, Lord Bishop of Raphoe, Letterkenny, Co. Donegal.

July 1. **LEEDS.**—Erection of a block of buildings in Hope Street, Leeds. Drawings and quantities of C. S. Nelson, Architect, Sun Buildings, 15, Park Row, Leeds, to whom tenders are to be sent.

July 1. **EWOOD, BLACKBURN.**—Mason's, joiner's, plumber's, and slater's work in the erection of a new church at Ewood, Blackburn. Persons desirous of tendering must send their names to J. A. Seward, architect, 148, Church Street, Preston.

July 1. **LITTLEHAMPTON.**—Erection and completion of a shelter hall on the Green at Littlehampton. Drawings and specification and form of tender on application to the Council's Surveyor, H. Howard, M.S.A., Town Offices. Tenders to be sent to the Chairman of the Council, Town Offices.

July 1. **RATHANGAN.**—Erection of new schools in Rathangan, for the Very Rev. Peter Campion, P.P., Kildare. Plans, etc., can be seen at the residence of the Rev. Patrick Loughlin, Rathangan, or at office of William H. Byrne and Son, Architects, 20, Suffolk Street, Dublin.

July 1. **PERRANZABULOE (CORNWALL).**—Erection and completion of cow-house, stable, and barn, at Polgoda Farm, Perranzabuloe, in the occupation of John Withiel. Plans and specifications may be seen at the farm house or at the office of Morley B. Collins, Architect, Clinton Road, Redruth. Tenders to be sent to G. C. Hancock, the Manor Office, St. Agnes.

July 1. **KNOTTINGLEY.**—Erection of a new school at Knottingley, for the West Riding Education Committee. Plans and quantities on application to the Architects, Tennant and Collins, of Pontefract. A deposit of £1 must be paid to the West Riding Treasurer, County Hall, Wakefield. Tenders to be sent to C. Harris, Divisional Clerk, Knottingley. Whole or separate tenders may be submitted.

July 3. **MEXBOROUGH.**—Asphalting, building retaining wall, and improvements to urinals, at Mexborough Garden Street and Doncaster Road provided schools, for the West Riding C.C. Specifications of W. R. Hudson, Education Office, Mexborough, to whom tenders are to be sent.

July 3. **TREDEGAR.**—Erection of thirty or more workmen's cottages, for the Glyn Building Club. Plans and specifications may be seen at the offices of A. F. Webb, Architect and Surveyor, High Street, Blackwood, or Tredegar, to whom tenders are to be sent.

July 3. **GUILDFORD.**—Erection of a receiving home for children, for the Guardians of the Union. Plans, specifications, etc., on deposit of £3 3s. with Edward L. Lunn, Architect, 36, High Street, Guildford. Tenders must be delivered to W. S. V. Cullerne, Clerk to the Guardians, Union Offices, Commercial Road, Guildford.

July 5. **BELFAST.**—Plastering and renovating Doagh Masonic Hall. Plan, etc., may be obtained from W. C. Heron, Doagh.

July 5. **ABERDARE.**—Erection of 10 houses for the Monk Street Building Club. Plans, etc., of Thomas Roderick, Clifton Street, Aberdare. Tenders are to be sent to E. J. Hughes, Solicitor, Canon Street, Aberdare.

July 5. **ABERDARE.**—Erection of a men's hall, institute, and free library, at Cwmbach, Aberdare, Plans, etc., of Thomas Roderick, architect, Ashbrook House, Clifton Street, Aberdare. Tenders to be sent to A. T. Atkins, Cwmbach National Schools, Aberdare.

July 5. **BALLYHERRIDAN, near ARMAGH.**—Erection of a new dwelling-house, at Ballyherridan, for William Menary. Drawings and specification, with full particulars, can be obtained from Sampson Jervois, M.R.I.A.I., Architect, Armagh, to whom tenders are to be sent.

July 6. **LUTON.**—Erection of a new public library for the Corporation. Plans and specification by S. F. L. Fox, A.M.I.C.E., Borough Engineer and Surveyor, Town Hall, Luton, of whom plans, etc., may be obtained on deposit of £3 3s. with the Borough Accountant. Tenders to be sent to Bruce Penny, Town Clerk, Town Hall, Luton.

July 6. **LONDON.**—Supplying (a) cupboards, time-table frames, mirrors, tables, stools, steps, extension ladders, etc.; (b) chairs; (c) "Sheffield" desks; (d) blinds; for the L.C.C. Full particulars may be obtained on application to G. L. Gomme, Clerk of the London County Council, County Hall, Spring Gardens, S.W., to whom tenders are to be sent.

July 7. **TIVERTON.**—Erection and completion of new school buildings, for the Governors of the Middle Schools and School of Art. Plans, etc., prepared by W. H. Ashford, A.R.I.B.A., Architect, 90, New Street, Birmingham. Bills of quantities and form of tender on application to E. S. Perkin, director, School of Art, Fore Street, Tiverton, accompanied by deposit of £2 2s.

July 7. **SWANSEA.**—Erection and completion of the following works for the Swansea Union Workhouse, for the Guardians: — (1) operating block, together with bridge connecting same to male block, etc.; (2) extension to female imbecile block. Plans and specifications, and bills of quantities and all particulars of the Architect, Charles T. Ruthen, Bank Chambers, Swansea, on deposit of £2 2s. Tenders to be sent to Llewn. Jenkins, Clerk, Union Offices, Alexandra Road, Swansea.

July 8. **PEAKDALE, near BUXTON.**—Erection of infants' school and additions to Peakdale Council School, near Buxton, for the Derbyshire C.C. Names to George E. Garlick, Architect, Quadrant Chambers, Buxton. Bills of quantities and forms of tender of the Architect upon deposit of £1 1s. Tenders must be delivered to the Architect. Two sureties required.

July 8. **FEATHERSTONE.**—Execution of builder, joiner, slater, plasterer, plumber and painter works, at the Featherstone New School, for the West Riding Education Committee. Plans and specifications with quantities on application to the West Riding Architect, County Hall, Wakefield. Deposit of £1 in each case must be sent by separate letter to the West Riding Treasurer, County Hall, Wakefield. Tenders to be sent to Francis Alvey Darwin, Clerk to the Council, County Hall, Wakefield.

July 9. **HULL.**—Execution of steel roof work in an extension of the Madely Street Baths, for the Corporation. Forms of tender and other particulars may be obtained on deposit £1 with A. E. White, M.InstC.E., City Engineer, Town Hall, Hull. Prints of contract plan will be supplied on payment of 2s. 6d. not returnable. Remittances must be made payable to T. G. Milner, City Treasurer. Tenders to be sent to the Chairman of the Baths Committee, at the Town Clerk's Office.

July 10. **BURY.**—Erection of a secondary school at Westminster Street, Bury, for the Corporation. Plans prepared by J. T. Halliday, A.R.I.B.A., of 14, John Dalton Street, Manchester, at whose offices drawings may be inspected, and also specifications and bills of quantities, upon deposit of £2. Tenders to be delivered to the Town Clerk, Bury.

July 12. **SOUTHAMPTON.**—Erection of an additional classroom for fifty children, and a cloakroom, at Ashley Council School, for the C.C. Plans, specification, and conditions of contract (no quantities), and other information, at the office of W. J. Taylor, County Surveyor, The Castle, Winchester. Tenders to be sent to H. Barber, Clerk to the County Council, The Castle, Winchester.

July 12. **MANCHESTER.**—Erection of the Moseley Road Municipal School, Fallowfield, Manchester, for the Education Committee. Plans and bills of quantities (including specification) at the Education Offices, Deansgate, Manchester, on deposit of £2 2s. Tenders to be sent to William Henry Talbot, Town Clerk. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

July 12. **TOTTENHAM.**—Execution of summer repairs to various schools in the district, for the Education Committee. Separate tenders are invited for repairs to playgrounds. Specifications, particulars, and forms of tender may be obtained upon application to W. H. Prescott, A.M.I.C.A., Surveyor to the Committee, Council Offices, Tottenham, on deposit of £1 1s. Tenders must be delivered to W. Mallinson, Clerk, Education Offices, Philip Lane, Tottenham. Fair wages clause.

July 14. **GRANTHAM.**—Erection of a girls' secondary school for the Kesteren County Council Education Committee. Quantities, etc., may be obtained from H. N. Dunn, A.R.I.B.A., Silver Street, Lincoln, on deposit of £1 1s. Tenders are to be sent to Hudson Donaldson, Secretary, County Education Office, 64, London Road, Grantham.

July 15. **PEKING, CHINA.**—Erection and completion of a group of buildings to be used as a bureau of engraving and printing, for the Chinese Government. Plans, etc., prepared by the architects, Milburn, Heister, and Co., Home Life Building, Washington, D.C. Plans, etc., at the Chinese Consulate, 88, Fenchurch Street, London. Bids from America and Europe must be filed with the Chinese Legation at Washington, D.C

July 15. **ST. ALBANS, HERTS.**—Alterations and additions to accommodate 582 additional patients at the Asylum, for the Visiting Committee. A selection will be made from names of the firms received, and the selected firms will then be invited to tender. Further particulars will be given by Rowland Plumbe, F.R.I.B.A., 13, Fitzroy Square, London, W., or by the Clerk to the Committee. Names to be sent to Walter Geo. Austin, Clerk of the Visiting Committee, Guildhall, Westminster, S.W.

(Continued on next page.)

THE
Federated Employers' Insurance Association, Ltd.

HEAD OFFICES:
8, King Street, MANCHESTER.

Non-Tariff—Founded by Builders.

THIS ASSOCIATION GUARANTEES THE DUE PERFORMANCE OF CONTRACTS and invites enquiries from Contractors in matters incident thereto. Negotiations tend to prompt and effective arrangements.

BUILDERS' RISKS so far as WORKMEN'S COMPENSATION AND PUBLIC LIABILITY are concerned form special features in connection with the Association's operations. Moderate Rates and equitable conditions apply.

FIRE, PERSONAL ACCIDENT AND ILLNESS, and miscellaneous Insurances are transacted.

Submit enquiries.

Federation Secretaries are invited to apply for an Agency.

GEO. L. DREW,
General Manager and Secretary.

No Date. **GRANTHAM.**—Erection of new residence, Belton Road, Grantham, for Theodore Norton. Application should be made to R. J. Girling, Architect, 1, St. Peter's Hill, Grantham, enclosing £1 1s. deposit.

No Date. **FRESHWATER, I.W.**—Alterations and additions in providing harness-room, etc., for the artillery drill hall, Freshwater. Plans and specification, and form of tender, on deposit of £1 1s. with Percy M. Du Feu, Architect, Ventnor, I.W.

No Date. **KNUTSFORD.**—Erection of a building for the Waterproof Paper Company, Limited. Plans and specifications may be seen on application to the Secretary at the registered office of the Company, Booth Mills, to whom tenders are to be sent.

No Date. **BRADFORD.**—Alterations and additions to St. Stephen's National School, Bowling Old Lane, Bradford. Plans, etc., may be obtained from T. L. Dixon (late Brayshaw and Dixon), Architect, Surveyor, etc., Bowling Old Lane, Bradford, and Halifax Road, Buttershaw.

No Date. **KIRKBURTON (near HUDDERSFIELD).**—Execution of masons', joiners', plumbers', plasterers', slaters' works, in alterations and additions to house at Kirkburton, near Huddersfield. Names to be sent to Harrison Brier, Architect, Savile Town, Dewsbury, and quantities will be forwarded when ready.

No Date. **ABERYSTWYTH.**—Improvements and repairs to the undermentioned school buildings, for the Cardigan County Education Committee. Ponterwyd, Penllwyn, Cross Inn (New Quay), Llanarth, Talgarreg, Penuwch. Plans and specifications and full particulars from the respective head masters or from Geo. Dickens-Lewis, County Architect, Aberystwyth.

ENGINEERING.

June 14-29. **SOUTHAMPTON.**—Construction of a scheme of drainage, together with settling tanks and three 62ft. circular bacteria beds, also a 70,000 gallon rain-water tank, together with alterations to the system of rain-water drainage at the Hants County Asylum, near Fareham, for the C.C. Plans, specification, and conditions of contract, bills of quantities, and all other information, of W. J. Taylor, county surveyor, The Castle, Winchester, on and after June 14, on deposit of £10 10s. Tenders must be sent to J. Railton Wyatt, clerk to visiting committee, Hants County Asylum, Fareham.

June 18-28. **LEITH, EDINBURGH.**—Laying main drains for sewage and surface water from the Redford Estate, and constructing new timber bridge over the Waters of Leith, Edinburgh, in the Scottish Command, for the Secretary of State for War. Plans, etc., of the Director of Barrack Construction, 80, Pall Mall, London, S.W., or at the Barrack Construction Office, Room No 226, Headquarters, Scottish Command, Edinburgh. Deposit of 10s. required. Tenders to be sent to H. De la Bere, Director of Army Contracts, War Office, Whitehall, London, S.W.

June 28—July 16. **LONDON.**--Erection of a steel stand pipe and other subservient works at Shooter's Hill, Kent, for the Metropolitan Water Board. Drawings, conditions of contract, and specifications at the offices of the Chief Engineer, Savoy Court, Strand, W.C., on and after June 28. Forms of tender, conditions of contract, etc., on the production of receipt for £10 deposit. Tenders to the Clerk, Metropolitan Water Board, Savoy Court, Strand W.C.

June 28—July 16. **LONDON.**—Construction of a water tower and other subservient works at Shooter's Hill, Kent, for the Metropolitan Water Board. Drawings, conditions of contract, and specification at the offices of the Chief Engineer, Savoy Court, Strand, W.C., on and after June 28. Forms of tender, conditions of contract, specification, etc., from the Chief Engineer on production of receipt for £10 deposit. Tenders to the Clerk, Metropolitan Water Board, Savoy Court, Strand, W.C.

June 30. **CARDIFF.**—Installation of a new heating apparatus at St. Catherine's Church, for the Committee. Tenders to be sent to the Secretary, 14, Pontcanna Road, of whom particulars may be obtained.

June 30. **GAINSBOROUGH.**—Installation of a new heating apparatus (low pressure) at the Church of St. John the Divine, Gainsborough. Further particulars may be obtained from Wm Surfleet, 87, Trinity Street, Gainsborough.

June 30. **REPTON.**—Provision, laying, and jointing of about 1¼ miles of 9in. and 6in stoneware pipe sewers, together with manholes, lampholes, and flushing chambers; also construction of liquefying tank, etc., for the R.D.C. Drawings and specifications, etc., on deposit of £3 3s. with F. A. Pickles, Assoc.M.Inst.C.E., 11, Park Row, Nottingham. Tenders to be delivered to C. F. Chamberlin, Clerk to the Council, Union Offices, Burton-on-Trent.

June 30. **BLAENAVON.**—Construction of about 85 lineal yards of a reinforced concrete culvert, 4ft. 9in. diameter, with contingent works, in the British Paragon system (specified), for the U.D.C. Plans and specifications and bill of quantities from E. W. Edmunds, Engineer and Surveyor to the Council, Council Offices, Lion Street, on deposit of £1 1s. Tenders to be delivered to John Thomas, Clerk to the Council.

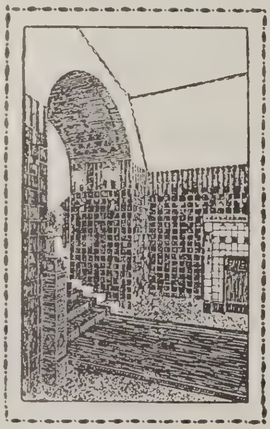
July 1. **TUNBRIDGE.**—Construction of masonry abutments and retaining walls, piling, etc., ready to receive steel superstructure of a bridge over the River Medway at Hartlake, in the parish of Hadlow, for the R.D.C. Drawings, specifications, bill of quantities, form of tender, etc., of Frank Harris, Engineer and Surveyor to the Council, Broadway, Southborough, Tunbridge Wells, on deposit of £1 1s. Tenders to be delivered to Neville R. Stone, Clerk to the Council, 23, Church Street, Tunbridge Wells.

July 6. **LONDON.**—Construction of a sewer, mainly of cast-iron, lined with concrete, and blue brick, of 6ft. to 8ft. internal diameter, and of a total length of about 42,450ft., to be formed mainly in tunnel, together with penstock and weir chambers, and other incidental works, from Northside, Wandsworth Common, Battersea, to the Deptford pumping station, Greenwich, for the L.C.C. Drawings, specifications, bills of quantities, form of tender, and other particulars, of the chief engineer, Maurice Fitzmaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon deposit with the cashier of the Council of £10. Tenders to be delivered at the County Hall, addressed to the Clerk of the L.C.C., Spring Gardens, S.W.

July 7. **MIDDLETON.**—Supply and erection of six sprinklers at the Sewage Works, Middleton, for the Corporation. Particulars, specification, and form of tender, may be obtained from W. Welburn, Borough Surveyor, Town Hall, Middleton, to whom plans of sprinklers must be sent. Tenders, addressed to the Chairman of the Surveyor's Committee, must be delivered to Frederick Entwistle, Town Clerk, Town Hall, Middleton. Fair wages clause.

July 8. **GREENWICH.**—Erection and equipment of two electric lifts at the Infirmary, Vanbrugh Hill, East Greenwich, S.E., for the Union. Specification and form of tender on application to Samuel Saw, Clerk, Union Workhouse, Woolwich Road, Greenwich.

Continued on page xxix.



"Modernia" Patent Glass Tiles

give an artistic and novel effect.

No glassy surface. Coloured throughout. Substance about ¼ inch. Any colour supplied. Prospectus, Samples, Estimates and Designs for complete decorations, free.

The "Modernia" Patent Glass Tile Co.

Sole Concessionaires: Aug. Brennecke & Co., 68, Finsbury Pavement, London, E.C.

TANK ROOF TO FACTORY 190 ft. by 57 ft.

The Chain Concrete Syndicate.

Constructional Engineers in Reinforced . . Concrete. . .

The most complete system in existence.
Every Member, Tension or Shear, RIGIDLY FIXED.
No Loose Bars to be misplaced during Concreting.

Fireproof Floors, Flat Roofs, Reservoirs, Culverts, Bridges, etc.

Write for Pamphlet—

1, Basinghall Square, LEEDS, and Carlton Street, CASTLEFORD.

July 8. **SOUTHEND-ON-SEA.**—Construction of about 2,900 yards of 33in. cast-iron sea outfall, and 1,550 yards of 39in. diameter and 2ft. 2in. by 3ft. 6in. oval concrete sewers, together with all piling, manholes, and other works, for the Corporation. General conditions, specification, bill of quantities, and form of tender, and drawings, on application to the Borough Engineer, Ernest J. Elford, M.I.Mech.E., Municipal Buildings, Southend-on-Sea, on deposit of £5 5s. Tenders to be delivered to H. J. Worwood, Town Clerk (pro.tem.), Town Clerk's Office, Southend-on-Sea.

IRON AND STEEL.

June 28. **LLETTY BRONGU (WALES).**—Supply and delivery of 1,200 yards or thereabout of 3in cast-iron water main pipes, valves, etc., coated with Dr. Angus Smith's solution, at Lletty Brongu Station, Port Talbot Railway, for the Ogmore and Garw U.D.C. Further particulars on application at the Council Offices, Brynmenyn, Glam. Tenders to be sent to S. H. Stockwood, Council Offices, Brynmenyn, Glam.

June 29. **SILSDEN.**—Supplying and laying 12in. cast-iron water mains and the taking out and relaying 8in. water mains; also excavating for laying the above, for the U.D.C. Plans and specifications, and bills of quantities, from Henry Longbottom, Surveyor to the Council. Tenders to be sent to John Driver, Clerk to the Council, Town Hall, Silsden.

June 29. **WEST HARTLEPOOL.**—Supply and delivery of wrought iron unclimbable fencing for the Corporation. Specification can be had from Nelson F. Dennis, M.I.C.E., Borough Engineer and Surveyor, Municipal Buildings. Seaton Carew, conveniences (Corporation to fix), 55 yards fencing, 5ft. high in 9ft. bays, 21 yards fencing 5ft. high to 10ft. radius, and short lengths 4ft. high; also 2 small gates with C.I. pillars. Stranton cemetery (contractor to fix, in Brierton Lane), 425 yards ornamental fencing 5ft. high in 10ft. bays, with C.I. standards, etc., and 1 pair gates with C.I. pillars. Tenders to be sent to the Town Clerk's Office, 78, Church Street.

July 3. **BARNSTAPLE.**—Supplying and fixing about 120 yards run of unclimbable iron fencing at the Portmarsh Field, for the T.C. Particulars can be obtained from S. Y. Saunders, P.A.S.I., Borough Surveyor, The Strand, Barnstaple, to whom tenders are to be sent.

Sept. 1. **LONDON, for BRISBANE (QUEENSLAND).**—Supplying 42in. and 48in. steel pipes, or 42in. and 48in. wrought iron pipes, or 42in. and 48in. cast-iron pipes, for the Brisbane Board of Water Works. Specifications and drawings may be obtained at the office of the engineer to the agent-general for Queensland, 409 and 410, Strand, London, W.C., on payment of £3 3s. Tenders must be sent addressed to the secretary, Brisbane Board of Water Works, Brisbane, Queensland.

PAINTING.

June 28. **LIVERPOOL.**—Painting the exterior of the Kirkdale Homes, Westminster Road, for the Select Vestry. Specification may be obtained of H. J. Hagger, Vestry Clerk, Parish Offices, Brownlow Hill, Liverpool, to whom tenders are to be sent.

June 29. **OSSETT.**—Cleaning, painting, etc., the interior of Ossett Parish Church. Particulars may be obtained from J. Lockwood, 20, Springstone Avenue, Ossett, to whom tenders are to be sent.

June 29. **GUISELEY, near LEEDS.**—Making about 460 yards of 9in. stoneware pipe sewer in Kelcliffe Lane, Guiseley, for the U.D.C. Plans and specification and bills of quantities and full particulars of Joe Battye, Surveyor, Town Hall, Guiseley, on deposit of 10s. 6d. Tenders to be sent to M. Rennard, Clerk to the Council, Guiseley.

June 29. **NORWOOD, S.E.**—Internal cleaning and painting at the School at Norwood, for the Guardians of the Poor of the Parish of Lambeth. Specification will be supplied on personal application on deposit of £2. Tenders to be sent to James L. Goldspink, Clerk to the Guardians, Guardians' Offices and Board Room, Brook Street, Kennington Road, S.E.

June 29. **LEYTON.**—Cleansing, painting, and repairs at four schools, improvement of gas lighting at two schools, to be executed during the summer vacation, and hot-water heating apparatus, at Sybourn Street School, now in course of erection, for the U.D.C. Specifications, conditions and forms of tender of William Jacques, A.R.I.B.A., 2, Fen Court, Fenchurch Street, E.C., on deposit of £1 (cheques will not be accepted). Tenders must be delivered at the meeting of the council to be held on June 29, at 7 p.m. Fair wages clause.

June 29. **LONDON.**—Cleaning and repainting stations, etc., at the following places, for the Great Western Railway:—16, Stations at Coed Poeth, Brymbo, Plas Power, and engine shed at Croesnewydd, near Wrexham; 17, stations, at Baschurch, Rednal, Chirk, Cefn, and Oswestry; 18, stations etc., at Park Royal, Ealing, Southall, Trumpers Crossing, Brentford, and Uxbridge; 19, stations at Windsor, Cookham, Bourne End, Twyford, Wargrave, and Shiplake; 20, stations at Goring, Cholsey, Wallingford, Didcot, Upton, Churn, Hermitage, and Woodhay; 21, bridges between Oxford and Birmingham, etc.; 22, bridges in Worcester, Birmingham, and Wolverhampton districts; 23, stations at Coleford, Monmouth (May Hill), Monmouth (Troy), Raglan, Llandenny, and Little Mill; 25, stations at Church Stretton, Craven Arms, Plealey Road, and Pontesbury; 26, stations at Onibury, Bromfield, Ludlow, and Woofferton. Specifications and forms of tender and bills of quantities at the office of the Engineer at Shrewsbury for 16, 17, 25, and 26; at 7, Eastbourne Terrace, Paddington, W., for 18, 19, and 20; at Wolverhampton for 21 and 22; and at Gloucester for 23. Tenders to be sent to G. K. Mills, Secretary, Paddington Station, London.

June 30. **EDINBURGH.**—Execution of painters' work at George Heriot's School, the Heriot Watt College, and the Trust Offices. Specifications, etc., may be obtained from John Anderson, Superintendent of Works. Tenders to be sent to Peter MacNaughton, Clerk, 20, York Place, Edinburgh.

June 30. **HOLYHEAD.**—Execution of (a) external painting of the Cybi Council School, Holyhead; (b) certain alterations at the Park Council School (infants' department), Holyhead, and (c) painting and repairs to the Llangeinwen (Dwyran) Council School, for the Anglesey Education Committee. Specifications may be inspected at the office of Jos. Owen, F.R.I.B.A., County Architect, Exchange Chambers, Holyhead. Tenders to be delivered to R. H. Williams, Secretary of Education, Education Offices, Llangefni. Tenders for the work at either or all the schools may be submitted.

July 1. **KING'S LYNN.**—Cleaning, distempering, and painting the ground floor of the female ward at the Infirmary, for the Guardians of the Union. Specifications may be seen at the Workhouse. Tenders are to be sent to R. C. Coulton, Clerk to the Guardians.

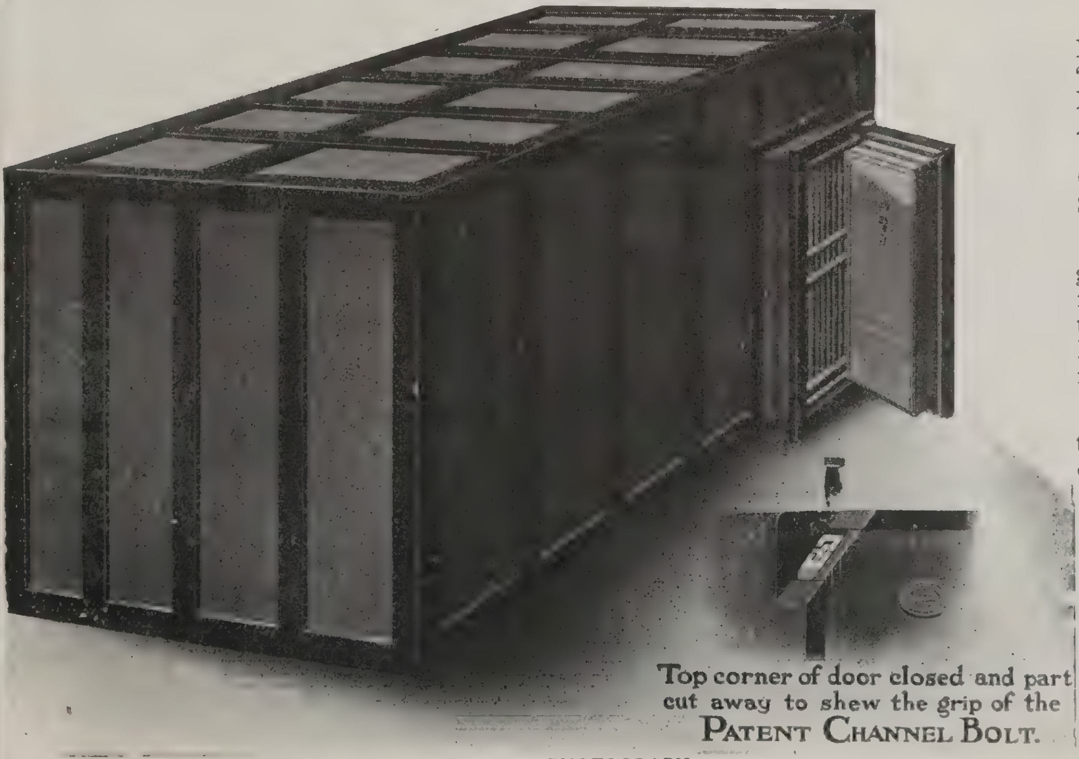
July 1. **WALWORTH, S.E.**—Painting, cleaning, etc., work at the Southern Relief Station, Boyson Road, Walworth, S.E., for the Southwark Union, London. Specification, etc., of Sydney Wood, Clerk, Union Offices, John Street West, Blackfriars, S.E., to whom tenders are to be sent. Fair wages clause.

July 1. **EAST DULWICH.**—Painting, cleaning, etc., work at the Infirmary, East Dulwich Grove, S.E., for the Southwark Union, London. Specification, etc., of the Architect, A. W. Tribe, 120, Clapham Road, S.W., on deposit of £2 2s. Tenders to be sent to Sydney Wood, Clerk, Union Offices, John Street West, Blackfriars Road, S.E. Fair wages clause.

(*Continued on next page.*)

STEEL STRONG ROOM.

Measurements: 18 ft. × 13 ft. × 8½ ft.



Top corner of door closed and part cut away to shew the grip of the PATENT CHANNEL BOLT.

FROM A PHOTOGRAPH

Undrillable Burglar-Proof Door, fitted with patent "Channel Bolts." Supplied February, 1909, to the Anglo-South American Bank, Ltd., for their new Chief Offices in Old Broad Street, London, E.C.

Strong Rooms and Burglar-Proof Doors have also recently been supplied by us to several of the leading Banks, Jewellers and Diamond Merchants.

We are pleased to quote to Architects' specifications or advise re Strong Room construction.

Steel Shelving for Strong Rooms a speciality.

LONDON OFFICE:
CAXTON HOUSE,
WESTMINSTER, S.W.
Telephone; GERRARD 4754.

PHILLIPS & SON, SAFE & STRONG ROOM MANUFACTURERS, Speedwell Works,
BIRMINGHAM.
Telegrams: "PHILLIPSON, Birmingham
Telephone Nos. 481 and 1641 Midland.

July 12. **BLACKBURN.**—Painting, etc., at various schools in the Borough, for the Corporation. Applications should be made to William Stubbs, A.M.I.C.E., Borough Surveyor, Municipal Offices, Blackburn, to whom tenders are to be sent.

July 13. **LONDON, S.E.**—Cleaning, painting, etc., at the Infirmary, Brook Street, Kennington Road, S.E., for the Guardians of the Poor of the Parish of Lambeth. Tenders to be sent to James L. Goldspink, Clerk, Guardians' Board Room and Offices, Brook Street, Kennington Road, S.E., to whom forms of tender and specification may be obtained on deposit of £2.

No Date. **ARMLEY.**—Painting outside 20 houses. Particulars may be obtained on application to 32, Cheltenham Street, Tong Road, Armley.

No Date. **BISHOP AUCKLAND.**—Painting the Waterloo Hotel, Bishop Auckland, and Fleece Hotel, West Auckland. Specifications to be seen on the premises. Tenders to be sent to E. I. Robinson, Bishop Auckland.

No Date. **ECCLESFIELD (YORKS).**—Painting and distempering at Provided Schools, for the County Council of the West Riding of Yorkshire. Specification may be obtained of W. Hague, Divisional Clerk, Education Office, Ecclesfield.

No Date. **WOODHOUSE.**—Painting and distempering at the Handsworth, Fence, Treeton, and Catcliffe Provided Schools, and asphalting Aston Provided School, for the County Council of the West Riding of Yorkshire. Applications for specification to be made to S. Abson, Divisional Clerk, Education Office, Woodhouse.

PLUMBING AND SANITARY.

June 26. **WINDSOR.**—Forming connections between house drains and sewers in the parish of Clewer Without from and after June 30, for the R.D.C. Conditions from the surveyor to the council, W. Menzies, Englefield Green, Surrey. Tenders must be delivered to J. E. Gale, clerk, 3, Sheet Street, Windsor.

June 28. **WANTAGE.**—Re-construction of drainage at the Workhouse, for the Guardians of the Union. Plan, specification, and quantities, on deposit of £2 2s. with Edwd. B. Ormond, Clerk to the Guardians, Wantage, to whom tenders are to be sent.

June 28. **ANSTON.**—Laying about 3,900 yards of 9in. and 6in. stoneware pipe sewers, construction of manholes, tanks, filters, and other appurtenant works at Anston, for the Kiveton Park R.D.C. Drawings and copies of the specification, bill of quantities, and form of tender at the offices of the engineers, Berrington, Son and Watney, Bank Buildings, Lichfield Street, Wolverhampton, and 28, Victoria Street, Westminster, S.W., on deposit of £5s. 5s. Tenders must be delivered to James Snow Whall, solicitor, Clerk to the Council, 66, Bridge Street, Worksop.

June 29. **NOTTINGHAM.**—Sanitary fittings and plumbing work, as follows, for the Education Committee:—1, Scotholme Council school, Southwark Council School, w.c. fittings; 2, St. Anne's Well Road Council School, Forster Street Council School, Ropewalk Council School, Carrington Council School, lavatory basins. Plans and copies of the bills of quantities and forms of tender from the office of the City Architect, Frank B. Lewis, Guildhall, on deposit of £1 1s. for each contract. Tenders to be delivered to W. J. Abel, Clerk, Education Offices, South Parade. Fair Wages Clause.

June 3. **WANTAGE.**—Construction of a sewer from Newbury Street to the Workhouse premises, a distance of one mile, 206 yards, for the U.D.C. Plans, specifications, and billse of quantities, can be seen with Edwd. B. Ormond, Clerk, Wantage, Berks, to whom tenders are to be sent.

June 30. **MANCHESTER.**—Construction of an underground lavatory for males at the Poultry Market, Shudehill, for the Corporation. Drawings may be seen and specification, bill of quantities, and form of tender obtained, at the office of the City Surveyor, Town Hall, Manchester, on deposit of £1 1s. with the City Treasurer. Tenders, addressed to the Chairman of the Lavatories Sub-Committee, to be delivered at the City Surveyor's office.

July 5. **STEPNEY, E.**—Construction of two underground conveniences in Horseferry Branch Road, by Commercial Road East, Ratcliff, E., for the Corporation. Drawings and bill of quantities, etc., of the Borough Engineer, M. W. Jameson, A.M.Inst.C.E., Municipal Offices, Great Alie Street, Whitechapel, E., upon deposit of £5 Bank of England note. Tenders to be sent to Geo. W. Clarke, Town Clerk, Municipal Offices, Great Alie Street, E.

July 6. **RAWTENSTALL.**—Construction, in Cowpe Road, within the Boroughs of Rawtenstall and Bacup, of a 12in. and 9in earthenware pipe sewer, together with manholes, lampholes, etc., for the Corporations. Plans and specification, bill of quantities, and forms of tender, on application to James Johnson, Borough Engineer, Municipal Offices, Rawtenstall, or William Henry Elce, Borough Engineer, Bacup, on deposit of £1 1s. Tenders to be addressed to James Whalley, Town Clerk, Rawtenstall.

July 10. **BELFAST.**—Internal plumbing work in connection with the Purdysburn Villa Colony Asylum (No. 1 Contract), for the Corporation. Specifications and particulars on application to the Architects, Graeme Watt and Tulloch, 77a, Victoria Street, on deposit of £1. Tenders to be sent to R. Meyer, Town Clerk.

ROADS AND CARTAGE.

June 26. **LEWES.**—Scarifying and steam road-rolling, for the Corporation. Forms of tender and further information can be obtained at the Borough Surveyor's Office, Town Hall, Lewes. Tenders to be left at the office of Montague S. Blaker, town clerk, Town Hall, Lewes.

June 26. **BEDWELLTY (WALES).**—Construction of a new road from Aberbargoed to Cwmsyfiog, and extension of road from Pengam to Fleur-de-Lis, for the U.D.C. Plans and specifications and forms of tender on application to the Council's Surveyor, J. H. Lewis, Assoc.M.Inst.C.E., Blackwood, Mon., upon deposit of £3 3s. Tenders to be delivered to T. J. Thomas, Clerk to the Council, Bargoed, Glam.

June 26. **ACOCK'S GREEN.**—Making up Douglas Road, Acock's Green, for the Yardley R.D.C. Plans, etc., of the Engineer and Surveyor, Arthur W. Smith, Council House, Sparkhill, near Birmingham. Bill of quantities and form of tender on deposit of £1 1s. Tenders to be delivered to Francis Ladbury Thompson, Clerk to the Council, Council House, Sparkhill, near Birmingham. Fair wages clause.

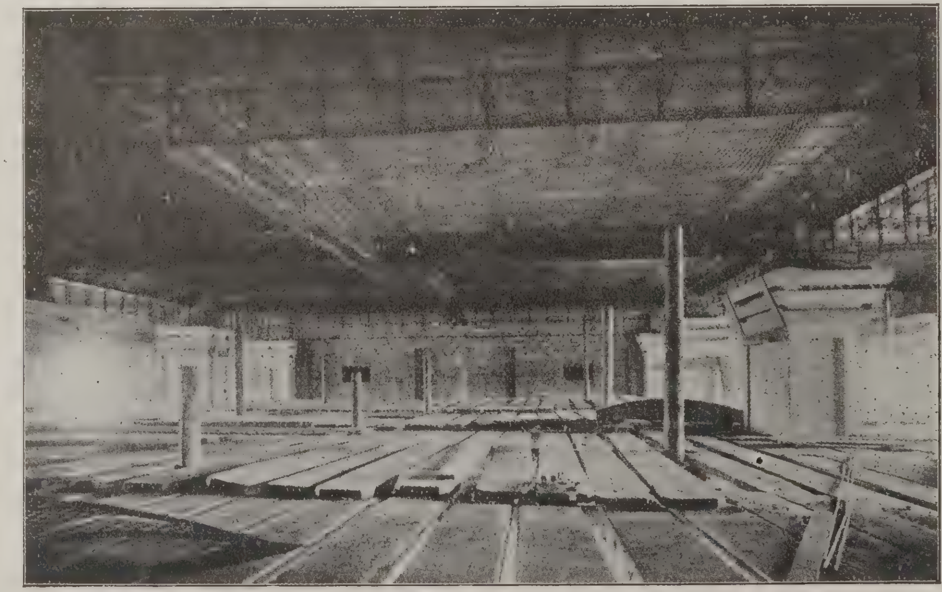
June 28. **ARUNDEL.**—Supply and delivery of 300 cubic yards of clean, hand-picked surface flints, for the Corporation. Form of tender, and particulars, may be obtained of the Borough Surveyor, E. F. Farrington, Town Hall, Arundel, to whom tenders are to be sent.

June 28. **DROXFORD (HANTS.).**—Hire of steam rollers and scarifiers, during the period ending March 31, 1910, for the R.D.C. Forms of tender and conditions of contract of the Clerk, or of A. V. Carter, District Surveyor, Droxford, Hants. Tenders to be sent to H. Godfrey Pearson. Clerk. Bishop's Waltham, Hants.

STRUCTURAL STEELWORK
AND REINFORCED
CONCRETE CONSTRUCTION.

Steel
Stancheons,
Girders,
Roof
Principals,
Reinforced
Concrete,
Walls,
Floors,
Partitions,
Theatre
Steppings,
&c.

Metal
Lathing
&
Ceilings,
Vaultings,
Covings,
Encasings,
Steelwork,
On our Patent
Methods.
Cheaper than
Timber
Backing.



Reinforced Concrete Floors, Steel Cradling, Bracketing and Lathing in course of Construction.

Write stating requirements
when we will forward
Catalogues.
Telephones { 657 Victoria. 5024 Bank.
Telegrams. "Kelvin, London."

A. & J. MAIN & Co., Ltd.,
Proprietors of THOS. POTTERS, Concrete Patents,
66, Victoria Street, S.W., and 49, Cannon Street, E.C.

June 30, 1909. Volume 29. No. 751.

THE BUILDERS' JOURNAL AND ARCHITECTURAL ENGINEER.

Caxton House, Westminster.

CONTENTS.

This issue contains the Official Reports of the National Building Trades' Federation, and articles of special Interest to Builders and Contractors.

Leaders: Compulsory Conciliation; "That Vile Wall"; How Healthy Dwellings Tell, 597; Legislation is Vexation; Honours and Arts; Shams - - - - - - - - 598
The Apprenticeship Question: A Lesson from France - - - - - - - - 598
Society of Architects - - - - - - 599
Victoria and Albert Museum - - - - 599
National Library of Wales, Aberystwyth - 602
Factory Inspection and the Building Trade - 607
Bath Master Builders' Association Annual Outing - - - - - - - - 608
Buildings in Progress - - - - - 608
Notes on Competitions: New School in Grove Street, Barnsley; Public Baths, Wood Green - - - - - - - - - 609
Builders' Notes: The London Building By-laws; Builders and the Budget - - - 609
Enquiries Answered - - - - - 611
Trade and Craft - - - - - - - 611
National Federation of Building Trade Employers: Official Reports- - - - 612-614
Building Trade Labour Conditions, British and Foreign - - - - - - - 615
Comparative Statement of Hours and Wages in the Building Trade of the Federated Towns - - - - - - - 616-618
Tenders - - - - - - - - vi., viii.
Complete List of Contracts Open - - xx.-xxv.

ILLUSTRATIONS.
The Victoria and Albert Museum, London: Sir Aston Webb, C.B., R.A., F.R.I.B.A., Architect: The Vestibule, 599; The East Hall, looking towards the Central Hall, 600; General View, 601; Ground and First-floor Plans - - - - - - - - 605
National Library of Wales, Aberystwyth: First-floor Plan of Accepted Design (Sidney K. Greenslade, A.R.I.B.A., Architect), 610; (for elevation etc., see Centre Plate); Design submitted by R. Wynn Owen, A.R.I.B.A., 603, 604; Design submitted by Arthur Harrison, F.R.I.B.A., 605; Design submitted by Henry T. Hare, F.R.I.B.A., 606; Design submitted by Adams and Holden, 607, 608; Sketch Plans of Design submitted by A. Marshall Mackenzie, A.R.S.A., and Son - 609

Compulsory Conciliation. According to Mr. William Scott, secretary of the Otago Employers' Association, the result of the Industrial Conciliation and Arbitration Act, in New Zealand, after thirteen years' experience, is that both employers and workmen consider it in the main a failure; the former, because it has been driven too far, and has endeavoured to accomplish too much; the latter, because it does not go far enough, and that to be a success it must provide a system of profit-sharing. During the years the Act has been in force, the Colony has experienced a period of great prosperity, owing almost wholly to the high price of its produce. The Act, therefore, has not been tried by a period of depression, and until so tried must be considered as merely an experiment. All the same, it has signally failed in creating better feeling between employers and workmen and in preventing strikes. As regards its effect on industries, the Act cannot be said to have made for better work, improved methods, or the fostering of trade. Indeed, it has had the opposite effect, and has greatly increased the cost of production, as has been amply shown in the evidence tendered before the Arbitration Court during the last year or two by the clothing, woollen, timber, and coal industries. The late Mr. Seddon, when Premier of the Colony, admitted "that the industries of the Colony had now more than they could carry; that trade was languishing and going back, and that the workers were no better off." The workers themselves have realised that the higher wages, shorter hours, and restricted conditions of work for which the Act is responsible have not improved their condition. The only remedy they see is either a high protective tariff or State control of production. It is admitted that the Act has operated beneficially as regards the remedying of sweating, but it is urged that this could have been equally well effected by an extension of the Factory Acts. It fails, however, in its larger object of preventing strikes. Mr. Scott asserts, as the result of thirteen years' experience as an employer and four years' experience as an employers' advocate before the Arbitration Court, that any method of regulating wages by Act of Parliament must in the end result in failure. Summing up, he says that the Act has "created strife, manufactured disputes, impaired the work, restricted the output, increased cost of production, put up the cost of living until a pound to-day goes no further than did 16s. in 1894, to the detriment of all. The latest statistics show the increase of wages to be from 8½ per cent. to 10 per cent., and the increased cost of living to be from 25 per cent. to 30 per cent." The example of New Zealand in this matter having been frequently urged upon the attention of legislators and employers in this country, it is only fair that Mr. Scott's indictment should be taken into account; and the interests in it of our builders, as almost the largest employers of skilled labour, is very obvious.

"That Vile Wall." (Shakespeare.) The late Mr. John Bellows, of Gloucester, who achieved considerable renown as an excellent printer, was also something of an antiquarian, and, in particular, had a keen nose for old walls. He "found, and identified, and preserved," beneath his printing works at Eastgate, Gloucester, portions of the east wall of the Roman town of Glevum. That very notable achievement should have sufficed him; but he must needs announce that under another shop, in the lower part of Westgate Street, he had found "proofs nine feet thick" of "one of the massive buttresses of the Castle of the West Gate of the Roman City of Glevum. There never was a more painstaking, conscientious, and correct printer than John Bellows of Gloucester. The proofs he was in the habit of producing were seldom susceptible of correction; but now Mr. St. Clair Baddeley has discovered that the "proofs nine feet thick" are sadly in need of revision. After careful examination, he finds that the said wall and buttress are no part of any Romano-British wall at all, but are portions of a sixteenth-century mansion belonging to Tudor Gloucester: a view in which the City Surveyor, Mr. R. Phillips, fully concurs, adding that "the structure may belong to any time between the fifteenth and seventeenth centuries." It is due to the memory of the late Mr. Bellows to say that he saw this wall only cursorily and by candle-light, whereas Mr. Baddeley has had the advantage of examining it by broad daylight, the site having been acquired by the Council, who are clearing the area. Naturally Mr. Bellows's most indubitable proofs were found in his own printing office; and, so far as we are aware, his own particular wall is genuine, plain, legible Roman. It might have been set up by the redoubtable Balbus himself. Given sufficient light, Mr. Bellows should have been easily able to distinguish between these vastly different types.

How Healthy Dwellings Tell. Does anyone still sigh for the days that are past, and grieve that this country is "going to the dogs," and that socially we have deteriorated and are still doing so? If so, let him consider the following hard facts taken from the Board of Trade publication on "Public Health and Social Conditions," and then take comfort in the unavoidable inference that the past fifty years has shown great social progress, and that there is hope that this progress will continue. Between 1851 and 1908 the population of the United Kingdom increased 63 per cent. The increase was greater in London and the large urban areas. For example, for every 100 persons living in London in 1851, there were 203 in 1908, and for 84 large urban areas the corresponding figures are as 100 is to 282. Hence we have a greatly increased density of urban population, which is a condition that admittedly increases the liability to disease and death unless it is corrected by improved sanitary conditions. The statistics, however, show that the average annual death rate in England and Wales has declined 29 per cent. in the period 1851 to 1907. This shows that, when the growth and distribution of population is considered, there has been immense progress in sanitation and social betterment. Infant mortality is one of the greatest difficulties incidental to a dense population; and from 1851 to 1900 but little progress seems to have been made in dealing with it, but since 1900 a fairly steady decline in the death rate of children under five years of age, and a more marked decrease in the case of children of between five years and ten years is manifest. Considering the period 1857 to 1907 as a whole, child mortality shows a decrease of nearly one-half. Another highly satisfactory feature, and one that is probably closely connected with the decrease of child mortality, is the marked decrease in child labour, which during the period 1851 to 1901 has also declined nearly one-half. From the particulars of unemployment, it appears that the applications under the Unemployed Workmen Act, 1905, which totalled 110,835 in 1905-6, declined to 87,001 in 1906-7, and again rose to 90,057 in 1907-8; but the number of persons who renewed their applications in successive years increased from 25,104 in 1906-7 to 30,257 in 1907-8. This increase in the number of successive applications is not a good sign, and should be very carefully watched. As regards Poor Law Relief in 1850 in England and Wales the number relieved equalled 56.5 in every 1,000 of the population, in 1908 it was 22.1 per 1,000, a fall of over 60 per cent. The decrease in London, however, was only about 47 per cent. The social betterment which these statistics show to have taken place has not been got without considerable cost to the community, as is shown by the average increase of local rates, which in 1867-8 were 3s. 3¼d. in the £, in 1889-90 3s. 8¼d., and in 1905-6 had risen to 6s. 1¼d. in the £, while during the period 1874-5 to 1905-6 the aggregate debt of local authorities increased from £92,820,000 to £435,545,000, without reckoning the capital of the recently formed Metropolitan Water Board. Vital statistics are the gauge of the enlightenment not only of the hygienist, the sanitarian, and the social reformer, but also of the architect and the builder, of whom at least the former, with his large powers of influence and control, can surely say, without undue self-elation, regarding this wonderful advance towards health and happiness, *pars magna fui*; for the improved health of the community is chiefly a matter of healthier dwellings

Legislation is Vexation. The annual report of the Chief Inspector of Factories, which was issued last month, speaks largely of a continuous advancement and improvement in the conditions of industrial life. Students of the legislation which during the last century has been concerned with the arts and productions of manufacture are of course well aware that the Parliamentary enactments which have become law have been created to minimise or altogether remove abuses and dangers which, not always foreseen, have grown up amidst changing economic conditions. A certain resentment against interference with the freedom of the individual was at one time felt, perhaps not unnaturally, but a clearer perception that the interests of both the employer and the employed are largely in accord has led to a better understanding. The Factory Acts may be said to achieve—or at least to aim at—a double purpose: first, they seek to assume something of the function of a brake upon the wheels of unlicensed industrial competition, and are at the same time something of a drag on the wheels of progress; and, secondly, they foster methods and conditions of work that, while they are no doubt less dangerous and less unhealthy than those that are not subject to legislative control, are often much more costly. So far as the building trade is concerned, the Chief Inspector notes that the Building Operations Bill had to be dropped after its introduction last year, owing to the pressure of Parliamentary business, but that it has again been brought forward for consideration this session. Beyond a slight exposition of the intentions of this Bill, very little mention of the building trade finds place in the report.

Honours and the Arts. In the King's Birthday Honours list, there is certainly a side glance at art, knighthoods falling to Mr. Merton Russell Cotes, who, besides being "the maker of Bournemouth" (which, on the whole, is by no means badly made), has got together a fine collection of art treasures, and has given them up, together with his residence at Bournemouth, as a museum; and to Mr. Hugh Lane, who has greatly enriched the municipal gallery at Dublin; but to architecture His Majesty's advisers appear to have been on this occasion stone-blind. Many of the total of thirty-five new knights, and perhaps one or two of the thirteen new baronets, appear to have been honoured less in their persons than in their professions; and in case several architects, with characteristic modesty, have shrunk from accepting these distinctions, they should be gently reminded that they have declined honours that would have adorned the profession in their persons. Recognition of this sort the State also owes to itself; for, as Dr. Holdsworth said the other day at Oxford, in introducing Mr. Thomas Brock, R.A., for a well-deserved D.C.L., "all States that wished their citizens to be educated in the Humanities must look with a favourable eye upon the liberal arts." It is perhaps in this spirit that knighthoods are bestowed upon actor-managers. But when the Mistress Art, whose creations are at least more enduring, is excluded from the category, her absence is rather conspicuous. Perhaps the "favourable eye" is only temporarily averted from her; for Sir Aston Webb has been honoured with a C.B. in recognition of his work for the Victoria and Albert Museum.

Shams. A writer in one of the monthly magazines has for his theme the common want of taste. He seems to think that the building and its contents are rendered contemptible by the craze for hurry and cheapness. He is disposed to blame those who minister—we rather think he writes "pander"—to this vice. The vendors are pretty heartily blamed for supplying "what the public want." The speculative builder, as usual, comes in for a liberal share of the lash. How wicked of him to build for gain, instead of building for glory! He imitates, in poor materials, the dwellings of the wealthy, in order to gratify the soaring ambitions of the pretentious poor. That is the kernel of the mischief—that people so are anxious to imitate their betters that they welcome the innumerable shams that seem to them to support this delusion. *Esse quam videri* would appear to them as a counsel of folly. If they cannot be what they wish to be, they will at least strive to look like it. They think it no shame to be a sham surrounded by shams, and hence they create a demand that it is commercially profitable and artistically sinful to supply. With regard to the masses, the case seems almost hopeless. They are a stiff-necked generation, not at all disposed to emulate the humility and simplicity of the Japanese; and as these two qualities happen to be of the essence of art, it must take yet another generation or two before the people become imbued with the principles of taste, and rise superior to their heritage of bad traditions. Then, as now, they will get the architects, the builders, and the buildings they deserve. It is entirely a question of "what the public want." The sad case of the vulgar rich is perhaps past praying for.

THE APPRENTICESHIP QUESTION: A LESSON FROM FRANCE.

There was held at Paris in April last a National Congress of Industry, Commerce, and Work, composed of representatives of employers, workmen, and Chambers of Commerce, to consider the crisis in apprenticeship in France.

We have previously referred to this question; suffice it to say, therefore, that it is generally admitted that there is such a crisis, and that it is imperative that something should be done to revive and reorganise a system of apprenticeship for the youth of that country.

The Congress represented 13 chambers of commerce, 7 associations of architects, 2 municipalities, 2 associations of property owners, 119 employers' associations, 67 workmen's unions, and 19 societies for instruction, besides a number of individual members.

In the opening addresses, stress was laid upon the following conditions, as accounting for the decline of apprenticeship; social necessity causing children to be set to earn as soon as they leave the primary school (in France this is at 12 years of age), while they are as yet too young to be usefully employed as apprentices. It was remarked that the intermediate years—12 to 15—were very critical for the young, and that habits of idleness and vagabondage were easily formed during that period, which would resist all subsequent efforts at reform. The great specialist on the subject of the protection of the youthful worker, M. Joly, was quoted as saying that his study of criminality between the years of 1839 and 1889 showed that the increase of criminality among minors of under 16 years of age was 140 per cent., and he did not hesitate to declare that among the causes of demoralisation he placed first the suppression of apprenticeship; other causes were — economic evolution, transforming methods of work and substituting machines for hand labour; and the state of the law, which will not permit apprentices to work in the same rooms as workmen who are working more than ten hours a day.

The deliberations of the Congress resulted in a series of resolutions to the following effect: That apprenticeship in commerce and industry be organised by the different professions, which, concurrently with the State, the departments, and the communes, will have to bear the cost. That a system of pre-apprenticeship be devised to prepare children for the choice of profession in the interval between leaving the primary school at twelve years and becoming apprenticed at fourteen to fifteen years of age. The chambers of commerce accept the mission of directing the systems of pre-apprenticeship and of apprenticeship itself, the details of the organisation to be confided to corporate societies recruited from each of the industrial and commercial bodies. That pre-apprenticeship tuition take the form of a preparatory workshop in connection with the primary school or otherwise (children to be admitted free without examination as soon as they leave the primary school), where they shall receive an elementary professional instruction which will enable them to choose an occupation with some intelligence. These preparatory workshops to be initiated by the employers' and workmen's associations acting under the patronage of the chambers of commerce, who will subvention them. That the law as to apprentices and workmen be modified to remove the anomaly mentioned previously. That the kinds of preparatory apprenticeship instruction to be taught in the various localities be fixed, by concerted action of the various chambers of commerce of the locality, as suitable to the local industries practised there.

A permanent committee was formed to carry on the work and to devise ways and means for carrying out the resolutions of the Congress, and to report to another Congress to be held next year.

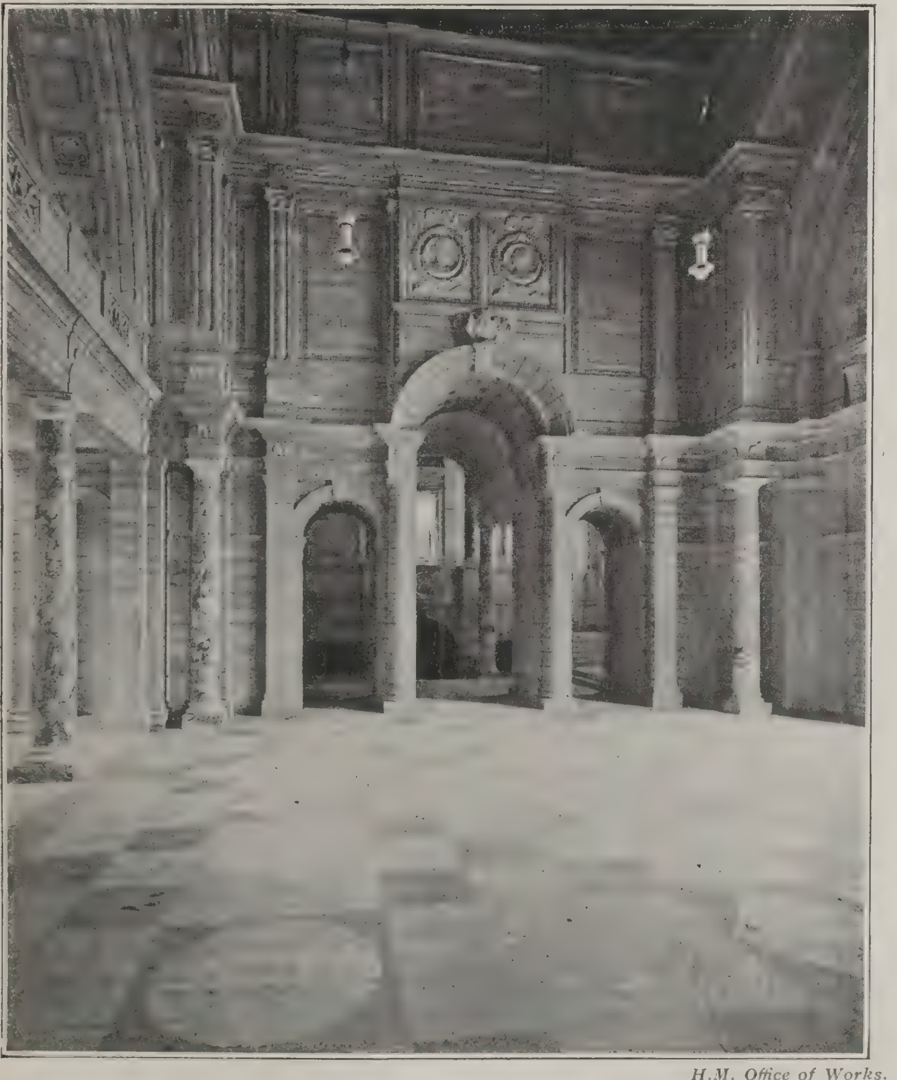
The building trade of France, and especially the Parisian builders, have the credit of having set this movement on foot. Bureaucracy in France moves with such exasperating slowness that the industrial and commercial classes have got out of patience, and are resolved to bring about a better state of things at their own cost rather than see the technical capabilities of their work men disappear in the way they threaten to do.

The question arises: are we much better off in this country in regard to preparing the young after they leave school for earning their own living? According to a report of the Royal Commission on the Poor Laws, between 70 and 80 per cent. of boys who are leaving school enter unskilled occupations. There is also overwhelming evidence as to the difficulty which such boys find in getting permanent work of a satisfactory kind. Boys of thirteen or fourteen easily find unskilled work involving long hours of deteriorating routine which lasts for a few years and then leaves the boy unfitted for or unable to enter a skilled occupation. Here we have one of the principal sources from which the "unemployed" are recruited.

Among the remedies suggested is the State regulation of boy labour by further raising the age of school attendance, or by a system of compulsory continuation schools. This suggestion agrees in the main with one we made some time ago to the effect that it is as much the duty of the State to see that every young person is taught to earn his or her own living as it is to see that they receive primary education, and that the system of apprenticeship training should be of a national and compulsory character.

SOCIETY OF ARCHITECTS.

The sketching party to Hatfield House on June 19th was even more successful than the visit to St. Albans in May, there being twenty-five ladies and gentlemen in the party, including two members of the council—Col. Leslie and Mr. Milnes Emerson. The party was first shown round the interior of the house, and the more energetic members made numerous thumb-nail sketches of the delightful Elizabethan details, and made roughly measured sketches of the mouldings. The so-called marble hall, with its beautiful minstrel gallery, was first visited. Thence the party was conducted through the corridor on the south front to the chapel in the north wing. Although the chapel contains much elaborate carving and painting, it is not particularly interesting either architecturally or historically, as it only dates back to 1837, having been rebuilt after the original had been destroyed by fire. Then the tour was made up the stairs in the west wing through the chapel gallery to the long gallery and library, and down the north-west stairs. The party then passed through the principal chambers of the east wing, and paid particular attention to the principal stairway. Passing out into the grounds through the south entrance, the party dispersed to settle down to sketch and photograph, and to enjoy the beauties of the gardens on the south and west front. A quantity of work was done with pencil, brush, and camera, and no doubt the society will be able to see the result of the work on the students' night, to be held during the winter months. Tea was served in the village at about 5.30.



H.M. Office of Works.

THE VICTORIA AND ALBERT MUSEUM, LONDON. THE VESTIBULE. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., ARCHITECT

The vestibule, 40ft., by 40ft. runs up through two floors of the building. The walls are faced with Portland stone, and the ceiling is of teak, carved and inlaid with a holly motif. Right and left of the vestibule, the staircases leading to the three floors of the side-lighted galleries are lined with pavonazza marble in flat slabs. The columns are of Brescia and the steps of piastraccia marble.

The next visit, on July 17th, will be to Gatton and Merstham in Surrey. At the former place there is one of the most interesting little churches in the country. It has been fitted by a late incumbent with some fine canopied oak choir stalls of Flemish workmanship. The altar and pulpit are from Nuremberg, and are attributed to Albert Durer. At the west end there is a fine carved oak west-country screen, and the chancel is panelled with Burgundian carving, while there are portions of Elizabethan date. Merstham has also an interesting church, with work of all the Gothic periods, and good details and brasses.

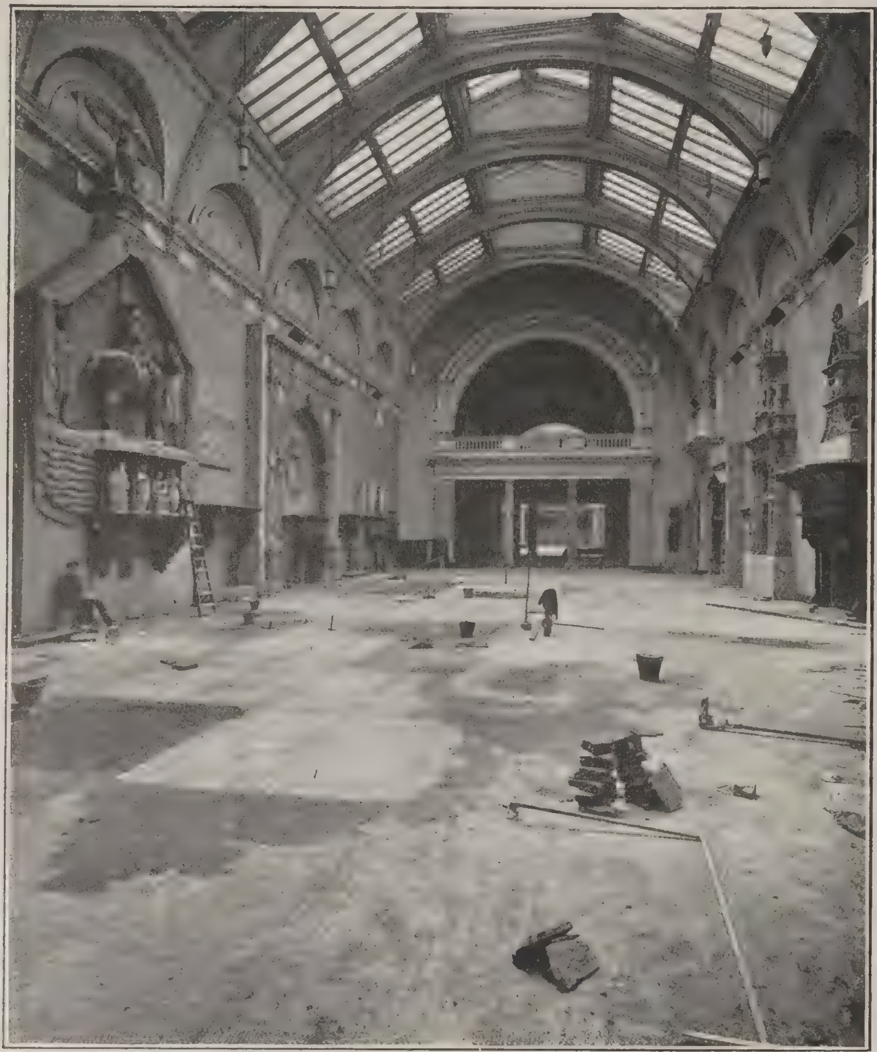
VICTORIA AND ALBERT MUSEUM.

Representatives of the Press were admitted on Wednesday last to view the interior of the Victoria and Albert Museum, which was formally opened by His Majesty the King on the following Saturday (June 26th). Designs for these buildings were invited in 1891 from six selected architects, and those submitted by Sir Aston Webb, R.A., were adopted. No decisive step was taken, however, until 1898, when the then Chancellor of the Exchequer, Sir Michael Hicks-Beach (now Lord St. Aldwyn), found himself in possession of a Budget surplus, from which he allotted a sum for the erection of the museum, and Sir Aston Webb was instructed to proceed with the plans. The foundation stone was laid by Queen Victoria on May 17th, 1899.

The new buildings have a frontage of 720ft. to Cromwell Road, and 275ft. to Exhibition Road. The total length of the perimeter of the site is occupied by three storeys of side-lighted galleries, the fourth-floor galleries being top-lighted, while the remainder of the site is covered with top-lighted courts. The total length of these galleries alone is three-quarters of a mile, and, including the long gallery of two floors that runs down the centre of the building, the galleries in the new building are just one mile in length, while the top-lighted courts have a superficial area of 6,500 square yards.

The Cromwell Road front, in the centre of which the main entrance is situated, is in a "flat" curve, following the line of the road, partly in order to secure a right angle at the corner of Exhibition Road, and partly to bring the building into line with the Natural History Museum. Other considerations that influenced the design were the great mass and height of the old Science building, which suggested the domes on the new, in order to preserve the scale; and the free Renaissance treatment "has been adopted as the one that best admits of the introduction of the very large amount of window space required in such a building, the balance between wall and void being provided in this case by the plain brick band round the building on the second floor." Over the front entrance is an opening lantern showing the outline of an imperial crown. The two turrets filling in the re-entering angles of the front, and supporting the central lantern, mark the positions of the two passenger lifts.

The front is faced with specially selected Portland stone, red brick being freely introduced in frieze and piers in sympathy with the buildings already erected. The sculptured decoration includes statues of thirty-two famous British artists and craftsmen, statues of ten craftsmen being on the Exhibition Road front, while facing Cromwell Road are, in the centre, ten painters; on the west flank, six sculptors, and on the east flank six architects. The statues of Millais, Watts, Leighton, and Constable were respectively executed by four students of the College of Art under Prof. Lanteri; and two each of the other statues were entrusted to the following sculptors: Messrs. Lynn Jenkins, Paul Montford, S. W. Babb, G. Bayes, A. Broadbent, W. S. Frith, J. Gamble, E. G. Gillick, A. H. Hodge, A. B. Pegram, J. W. Rollins, R. Shepherd, A. G. Walker, and O. Wheatley. The figure of



H.M. Office of Works.

THE VICTORIA AND ALBERT MUSEUM, LONDON. THE EAST HALL LOOKING TOWARDS THE CENTRAL HALL. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., ARCHITECT.

This hall and its counterpart, the West Hall, are the two long galleries flanking the Domed Central Hall. They are fifty feet wide, top lighted, and are devoted to housing the larger Architectural Exhibits, some of which, as can be seen in the view, have already been placed in position.

Fame on the lantern, and the two figures in the buttresses below, representing respectively Architecture and Sculpture, are by Prof. Lanteri, while Mr. Alfred Drury, A.R.A., executed the statue of Queen Victoria, with her supporters, St. Michael and St. George; the statue of the Prince Consort, under the arch; and the figures of Knowledge and Inspiration, one on each side of the entrance; as well as the carved panels in the archivolt, each panel bearing, in letters of gold, a portion of a quotation from Sir Joshua Reynolds's Discourses: "The excellence of every Art must consist in the complete accomplishment of its purpose." The carved spandrils representing Truth and Beauty, are by Sir George Frampton, R.A.; the statues of King Edward VII. and Queen Alexandra by Mr. Goscombe John, R.A.; and the general architectural carving on the front has been done by Mr. W. S. Frith.

In planning the interior, the architect had by no means a free hand, as he was under the necessity of "linking up and adapting to the various levels of the old building." The vestibule, 40ft. by 40ft., runs up through two floors of the building. The walls are faced with Portland stone, and the ceiling is of teak, carved and inlaid with a holly *motif*. Right and left of the vestibule, the staircases leading to the three floors of the side-lighted galleries are lined with pavonazza marble in flat slabs. The columns are of Brescia, and the steps of piastraccia. The walls of the galleries and courts, being intended for the exhibition of objects, are of course kept perfectly plain, but "an attempt has been made to prevent weariness to the visitor by avoiding galleries of undue length, by providing vistas and glimpses through the building in passing, and by varying the sizes, proportions, and design of the various courts and galleries." The long gallery gives easy access to all the courts on each side, and the courts on the north side of the gallery neither oppose barriers to the visitor nor confuse him as in a maze.

Flanking the domed central hall are the long eastern and western halls, 50ft. wide, in which the larger architectural exhibits are being placed. The west and east central courts leading from the central court that forms the main entrance to the older portions of the Museum, have their naves and aisles divided by arcades of Basilican type. The naves have flat ceilings, and the aisles are vaulted. The great octagon court, which was the chief scene of the opening ceremony on Saturday last, is 110ft. in diameter and 65ft. high in the centre.

The galleries are 32ft. wide and 20ft. high, except in the lower ground floor, where they are 18ft. high. As Sir Aston Webb points out in his "Short Description of the Building," included in the official guide provided for the use of Press representatives, the windows are carried up close to the ceiling, and on this wall the glass area is equal to the wall area, so that the opposite wall is completely lighted. All the walls are lined with Cranham bricks, so that objects may be easily fixed to them, while all walls towards internal courts are built hollow as a precaution against damp.

The floors of the galleries are of polished teak, those of the courts being paved with marble mosaic, laid out in squares to facilitate the arrangement of cases and objects.

Naturally, the heating and ventilating arrangements have been devised with extreme care. The heat will be derived from six Lancashire boilers, which have been placed in the basement between the north-west entrance and the College of Science. The Atmospheric Steam Heating Co.'s vacuum system of heating has been installed. Ventilation is on a plenum system, by means of which the air can be changed four times an hour, or more frequently if necessary, and can be warmed or cooled at will.

The architect is Sir Aston Webb, R.A., F.R.I.B.A. The general contractors for the foundations and up to the ground floor are Messrs. Leslie and Co., of Kensington; and Messrs. Holliday and Greenwood, of Brixton, erected the superstructure, executed all the woodwork, including the fine teak ceiling, already mentioned, with its carved and inlaid holly decoration, and all the plumbing work.

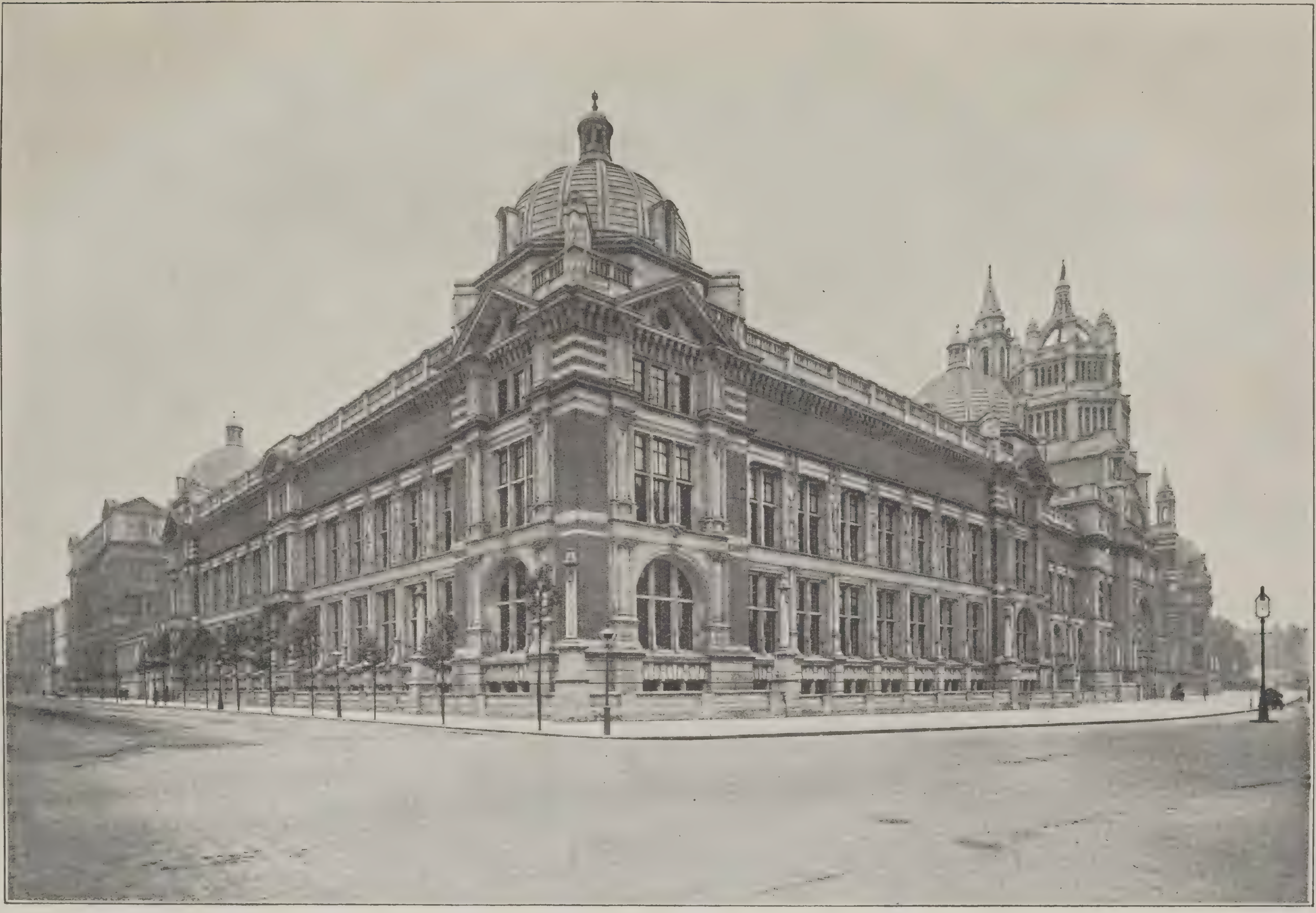
The chief clerk of works was Mr. H. W. Tanner; the general foreman, Mr. J. Farndon. The following are some of the subcontractors engaged on the work:—Marble work, Farmer and Brindley; Walton, Goody and Cripps; and Burke and Co., all of London. Mosaic work, Art Pavements and Decorations, Ltd.; ornamental plasterwork, G. P. Bankart; paint, etc., R. Gay and Co.; distemper, Silicate Paint Co., metalwork, Hart, Son, Peard, and Co.; glazing, W. E. Rendle and Co., London; carving, W. S. Frith, London; expanded metal for plasterwork, A. and J. Main, Ltd.; Mack partitions, J. A. King and Co.; Cranham brick partitions, J. H. Sankey and Son; heating, Atmospheric Steam Heating Co.'s system; electric installation, fixing, etc., T. Clarke and Co., London; electrical fittings, The General Electric Co., London.

Messrs. T. Clarke and Co. inform us that there are in the building approximately 5,000 lights, and that 75 miles of wire and 95,000ft. of screw galvanised steel tubing were used. A feature of the wiring is that any of the cables can be easily withdrawn and new wires substituted without interfering with the decorations or flooring. Arc lamps are employed for lighting the large courts and galleries, and the smaller galleries are lit by five-light fittings, with Osram lamps.

The opening ceremony was brief and simple. The Archbishop of Canterbury having read a special prayer for the occasion, and led in the Lord's Prayer, gave the Benediction. The Hon. Sir Schomberg McDonnell then carried the golden key of the building, on a red velvet cushion, to the foot of the dais, where Mr. L. Harcourt (First Commissioner of Works) took it from him and presented it to the King, who handed it to Mr. Runciman. As he did so the King said: "I have great pleasure in declaring the Victoria and Albert Museum now open."

Among the addresses presented to his Majesty at the opening ceremony was one from the workmen who have been engaged on the erection of the building. The King, in reply, expressed his pleasure at having had presented to him this address by the clerks of works, foremen, artisans, and mechanics, and said he was glad to have the opportunity of congratulating the workmen on the results of their labour. "I am informed," his Majesty said, "that all have worked with a high degree of skill, and with keen interest in their respective tasks, with the result that the construction, finish, and decoration of the building are in every way worthy of the architect's impressive conception."

A surprise of the occasion was the unexpected announcement made by Mr. L. Harcourt, Chief Commissioner of Works, who, in making the presentations to the King and Queen, said: "To receive the honour of knighthood, Mr. Cecil Smith." On Monday it was announced that his Majesty had been graciously pleased to confer upon Sir Aston Webb, R.A., a Companionship of the Order of the Bath.



THE VICTORIA AND ALBERT MUSEUM, LONDON. GENERAL VIEW. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., ARCHITECT. *H.M. Office of Works.*

The Cromwell Road front, 720ft. long, in the centre of which the main entrance is situated, is in a flat curve, following the line of the road. The adoption of this curve, which prevents a sight of the full facade, has been criticised; but it was adhered to partly in order to secure a right angle at the corner of Exhibition Road, and partly to bring the building into line with the Natural History Museum. The front is faced with specially selected Portland stone, red brick being freely introduced in frieze and piers in sympathy with the buildings already erected. The sculptured decoration includes statutes of thirty-two famous British artists and craftsmen, statues of ten craftsmen being on the Exhibition Road front, while facing Cromwell Road are, in the centre ten painters; on the west flank six sculptors, and on the east flank six architects.

NATIONAL LIBRARY OF WALES, ABERYSTWYTH.

The assessor, Mr. Reginald Blomfield, A.R.A. (nominated by the President of the Institute), presented his report at the annual meeting of the council of the National Library at Aberystwyth, on June 4th, and after consultation with the president, Sir John Williams, and with the librarian, Mr. John Ballinger, the design of Mr. Sydney K. Greenslade, 11, Gray's Inn Square, London, was selected and unanimously adopted by the council.

Besides the successful competitor, the competition was limited to the following architects, to whom an honorarium of thirty guineas each was allowed:—Mr. Henry T. Hare, 13, Hart Street, Bloomsbury; Mr. Arthur Harrison, Council Chambers, 109, Colmore Row, Birmingham; Messrs. A. Marshall Mackenzie and Son, 13, Waterloo Place, Pall Mall, W.; Messrs. H. Percy Adams and Charles Holden, 28, Woburn Place, Russell Square, London; and Mr. R. Wynn Owen, 60, Castle Street, Liverpool.

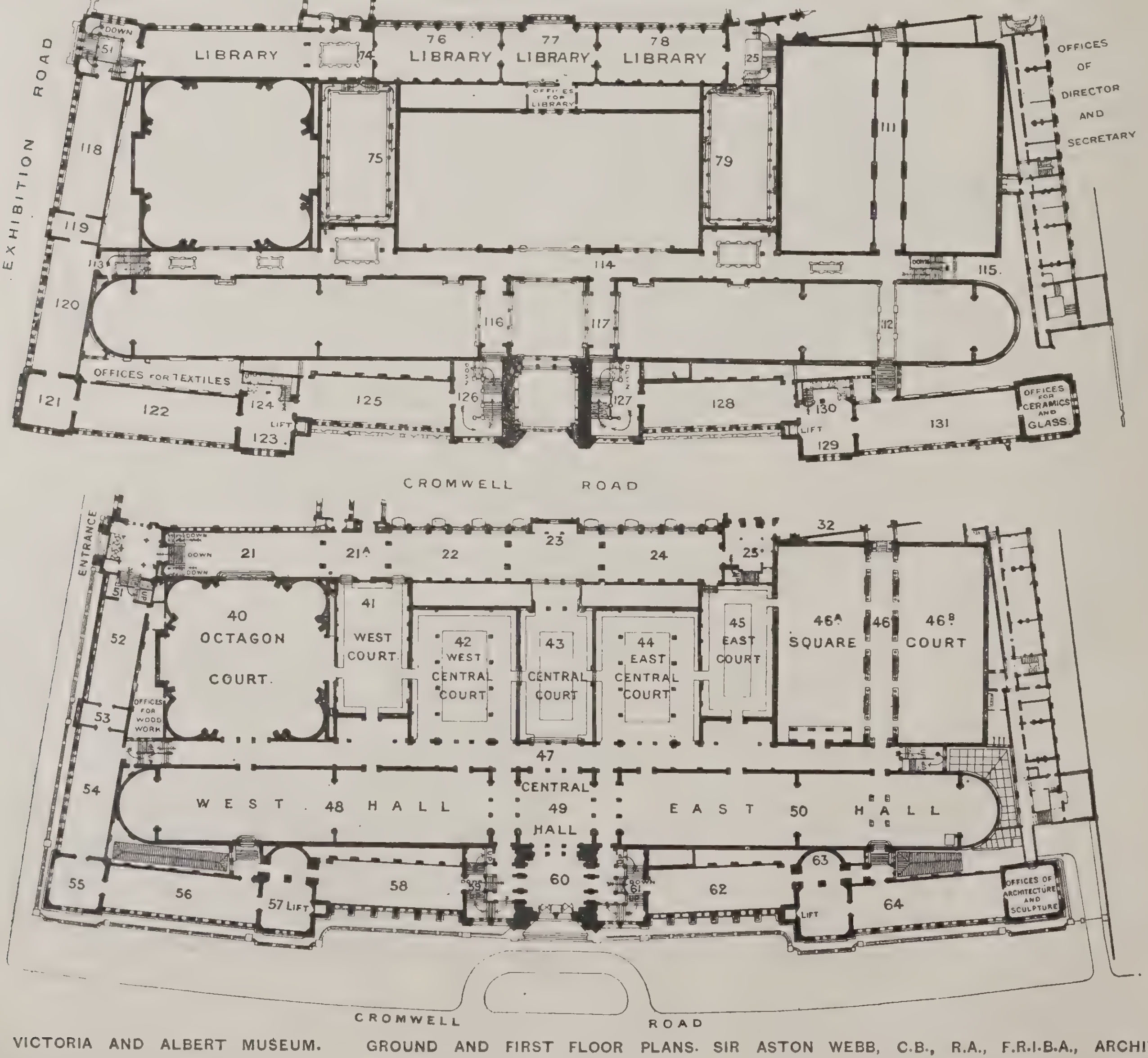
In the conditions, emphasis was laid upon the desirability of emphasising the national character of the institution, and of taking full advantage of the commanding position of the site. It was suggested that "strong, simple outlines, which will stand clear against the background of hills and sky," were desirable, and that uniformity of colour in the materials should be aimed at, "to contrast boldly with the surroundings."

The administrative block and library hall were to be designed on a scale not likely to call for extension at some future time. (The possible extensions were to be provided for in the book-stack and special rooms.) It was requested that the designs should include a general scheme for the approaches to the buildings from the main road, and for the disposition of the official residence or residences contemplated, and that provision should also be made for the introduction of memorials—in suitable sites and spaces—to benefactors and persons of literary eminence.

The drawings required were to be in black and white, and all to ⅛th scale. No perspective was admitted, and the front elevation was to be rendered in monochrome. The other drawings were to consist of floor plans, elevations of each part, and all necessary sections. A report accompanying the work of each competitor was also requested. The amount to be spent on the buildings, exclusive of bookcases and movable furniture, was to be, in the first case, £25,000, and ultimately about £45,000.

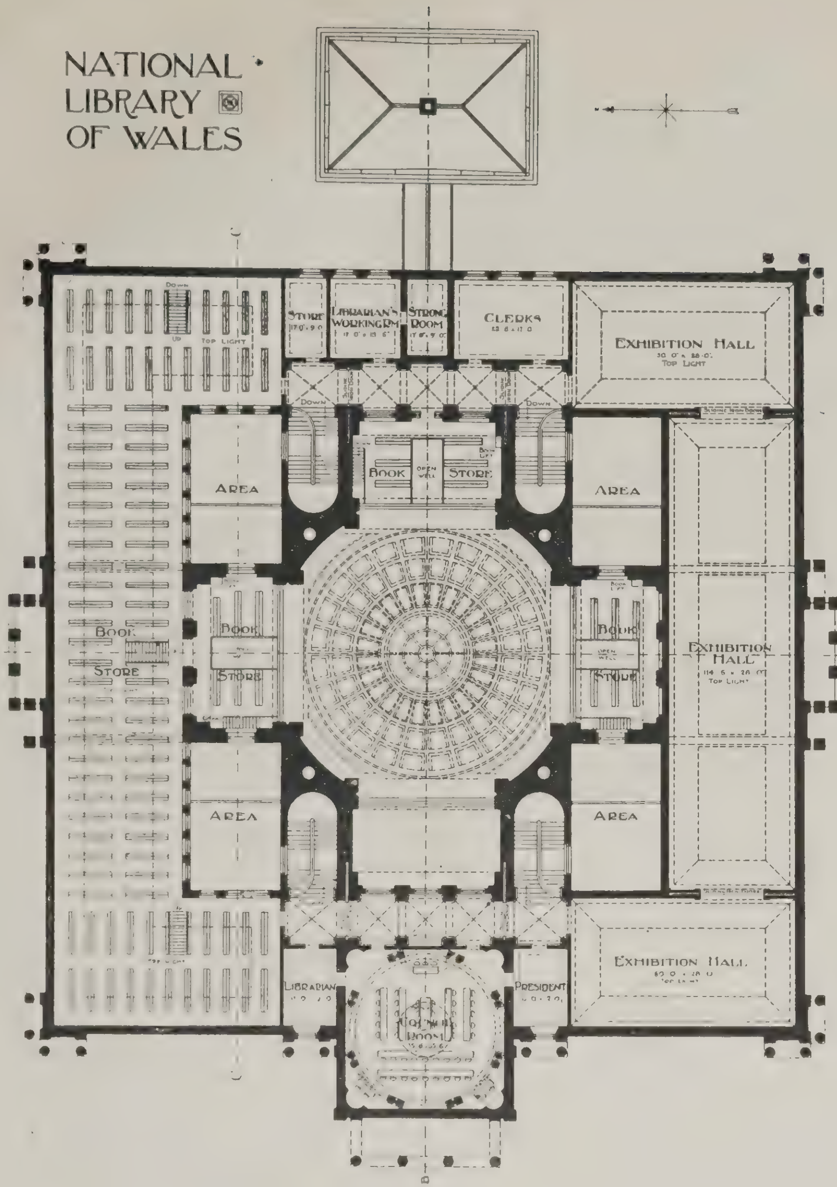
The necessary accommodation was to include, in the administrative department, a council room, of sufficient size for a meeting of 35, plus officers and reporters; librarian's private room, president's private room, strong room, and accommodation for assistant librarian, clerks, telephone, record, and catalogue, typewriting, and store-room for stationery and supplies; packing room, cloakroom for public and staff (both sexes); porter's room adjoining entrance hall. It was suggested that this department should form the centre of the main front, with a frontage of 75ft., and a height of 55ft. to the springing of the roof, divided into four floors, and that the private rooms for the president and librarian be on either side of the council room. In the department of printed books, a library hall of about 5,600 sq. ft., with seats for 50 readers, and book storage for 100,000 volumes, the height to range with the administrative department. The system of book-storage was to be arranged in multiples of 7ft. 6ins. from gallery to gallery, with entrances from the main floors of the administrative block to every second gallery. It was decided that this hall should be "of an impressive character, with books as the main feature," and that provision should be made for building rooms as required for special collections. In the department of manuscripts, a storage space for 25,000 volumes, capable of extension to store 50,000 volumes, special provision to be made for perusal of manuscripts in absolutely fireproof rooms, on the ground floor, 15ft. high, with arrangements for isolating this department by means of fireproof doors and rolling iron shutters for the windows. In the exhibition department, an exhibition hall, to be used by the public for inspection of rare books, fine bindings, etc., about 5,600 sq. feet, arranged in two or three continuous galleries 15ft. high.

In this portion of the building also provision was to be made for photographic rooms, patent print, and map rooms, room for Parliamentary papers and blue books, newspapers and periodical file rooms. In the book-storage department, provision was required to be made for the future storage of books on an unlimited scale, by means of a steel stack to be placed at the back of the site, where it could be expanded indefinitely,



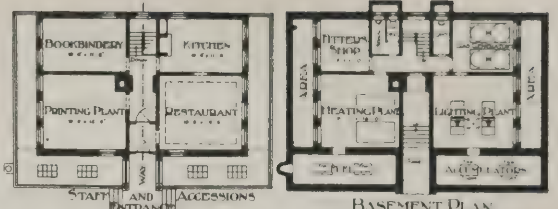
THE VICTORIA AND ALBERT MUSEUM. GROUND AND FIRST FLOOR PLANS. SIR ASTON WEBB, C.B., R.A., F.R.I.B.A., ARCHITECT.

NATIONAL LIBRARY OF WALES

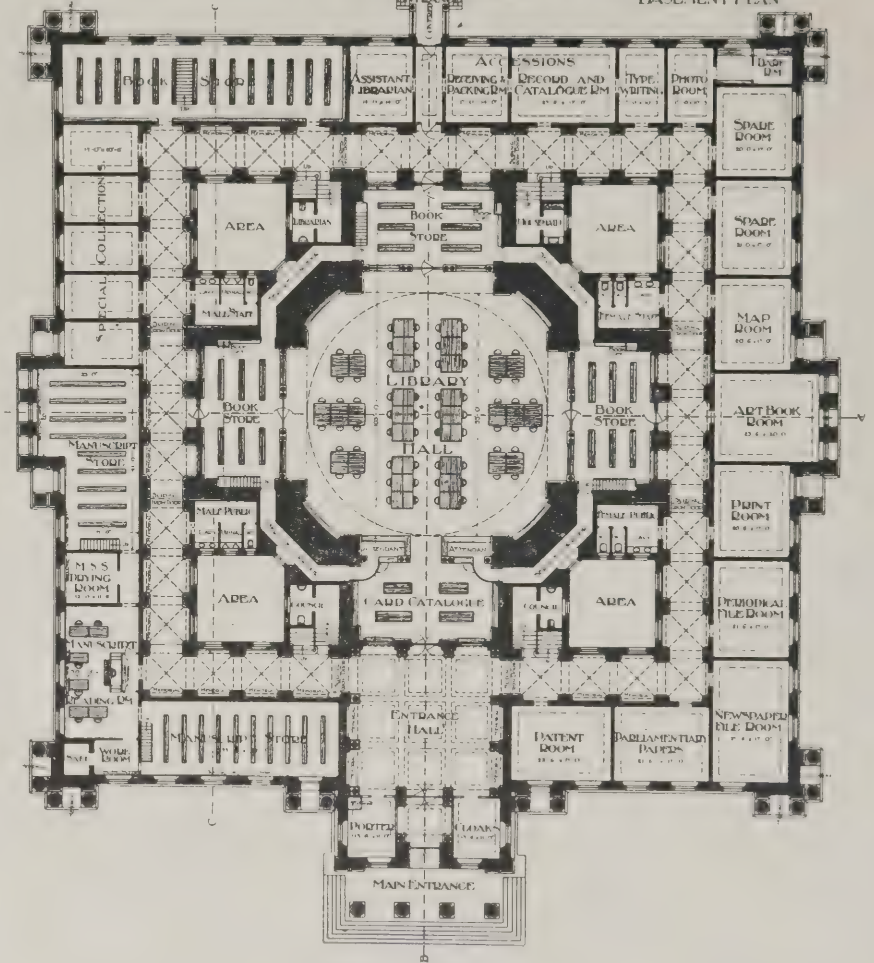


FIRST FLOOR PLAN

NATIONAL LIBRARY OF WALES



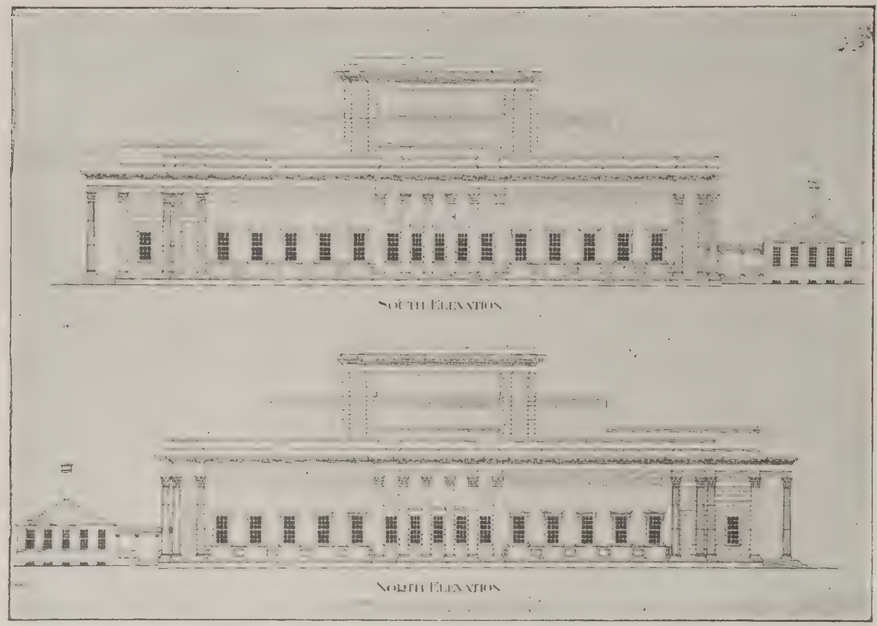
BASEMENT PLAN



GROUND FLOOR PLAN

NATIONAL LIBRARY OF WALES, ABERYSTWYTH. DESIGN SUBMITTED BY R. WYNN OWEN, A.R.I.B.A.

From the purely architectural point of view this design is wholly admirable. The fine spaciousness of the well-shaped Central Library, and the homogeneous character of the plan throughout, seem worthy of all praise. A pleasant feature is the corridor running on all four sides of the ground floor plan and lit by areas. This not only gives convenient access at all points, but in itself constitutes the required provision for the suitable introduction of memorial busts. The administrative block however is grouped at the back, whilst the Council Chamber, Librarian and Presidents' rooms—which would seem to come within the category of administrative rooms—are placed upon the main part.



THE WELSH NATIONAL LIBRARY, ABERYSTWYTH. DESIGN SUBMITTED BY R. WYNN OWEN, A.R.I.B.A.

The elevational exigencies apparently determine the disregard of the warning contained in the conditions with reference to the inadvisability of introducing skylights. By means of these, practically the whole of the upper floor is lighted. But the gain to the elevations is, we think it will be generally admitted, undeniable.

with ample provision for light to all parts, and easy access from the library, each book storey in the stack to be 7ft. 6ins. from floor to floor—a height required to govern the heights of all rooms (except the library hall and the top rooms of the administrative and exhibition blocks), so as to secure uniformity in the floors throughout. It was suggested that the steel stack should form the fourth side of a quadrangle, with provision for extension to the rear as required, the administrative department, library hall, and exhibition hall forming the other three sides.

A separate detached building was to be provided for the warming and generating plants, official residences being provided on another portion of the site, no domestic quarters were to be included in the main building, which was required to be thoroughly fireproof throughout. It was intended that the administrative, printed books, and manuscripts departments should be proceeded with immediately, the exhibition hall and book-stack to be added later.

As will be seen from a comparison of the different plans submitted, the framing of the conditions gave considerable scope for variety of treatment.

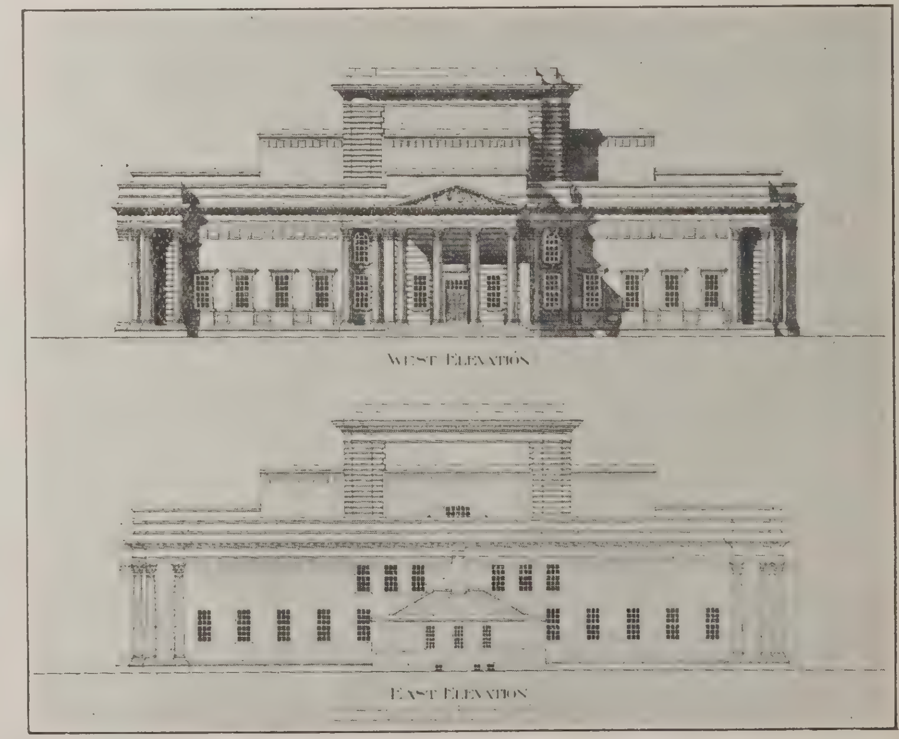
Without doubt, Mr. Greenslade's is the most logical and scientific solution of the problem. He has wisely fallen in with the suggestion embodied in the conditions regarding the disposition of the administration block, which forms in his design the outstanding feature of the main facade. In his placing of the book-stack on the fourth side of the quadrangle, he has also adopted another admirable suggestion. The access throughout appears to us to be all that could be desired, and the distribution of the books in the library hall very satisfactory. The working portion of the library is restricted for the most part to the ground floor, the first floor being treated as the main floor and the exhibition galleries placed above. This restriction of the working department to the lower part of the building would be a most satisfactory arrangement in actual practice, and we cannot but commend the ingenuity and thoroughness with which even the smallest details are worked out, and provision made for all possible requirements in a manner that reveals an intimate knowledge of the practical working of the department. The relation of the despatch and receiving rooms and the examining and repairing rooms with regard to the circulating library and future book-stacks, is exceedingly fortunate, and the lifts and service stairs for staff are conveniently placed. Perhaps the best feature of the whole scheme is the complete isolation of the manuscripts, which are to form the most valuable portion of the collection.

At the same time, we think it will be felt that this close attention to general convenience has been given rather at the expense of such architectural qualities as we should naturally expect in what is, after all, intended to be a great national monument. In the main elevation, the general composition is, we think, satisfactory, and the detail in parts shows a pleasing *neo-Grec* tendency. But we must confess that we do not find ourselves altogether in agreement with the rather Gothic perpendicular feeling of the individual features, and in more than one place—as, for example, in the cutting of the band, which forms the base of the main order, by over-tall windows—we could have wished for a closer adherence to that Classic spirit which the main outline of the design professes to embody.

With regard to the side elevations, which it will be seen are similar to each other in composition, the timid projection of the end and centre masses gives an appearance of indecision, in our opinion, which contrasts unfortunately with the bold modelling of the main part, and produces at the contiguous corners an appearance of somewhat crude inequality or treatment. And the elevation of the book-stack might have received more attractive handling.

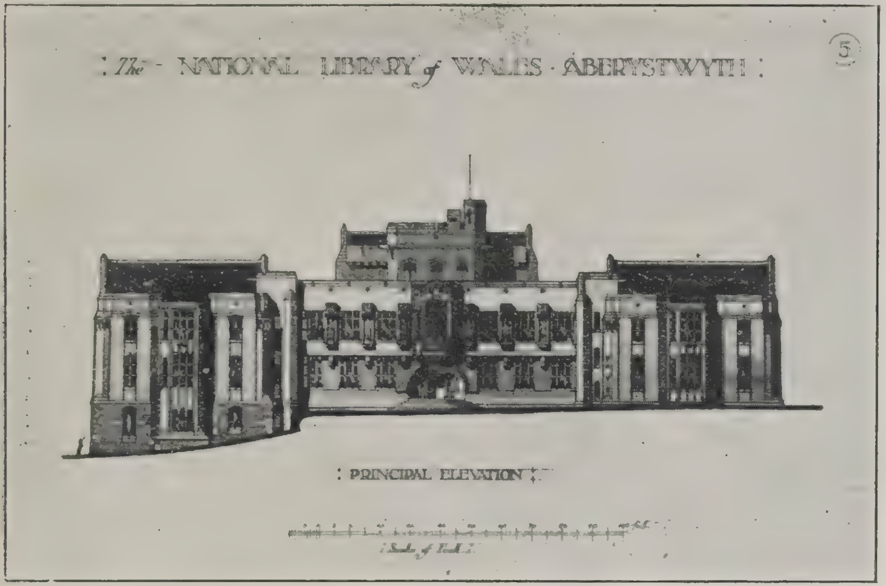
From a purely architectural point of view, Mr. Wynn Owen's design is wholly admirable, both with regard to plan and elevations. The fine spaciousness of the well-shaped central library, and the homogenous character of the plan throughout, seem to us worthy of all praise. A pleasant feature to notice is the corridor running on all four sides of the ground floor plan, and lit by areas. This not only gives convenient access at all points, but in itself constitutes the required provision for the suitable introduction of memorial busts, etc.

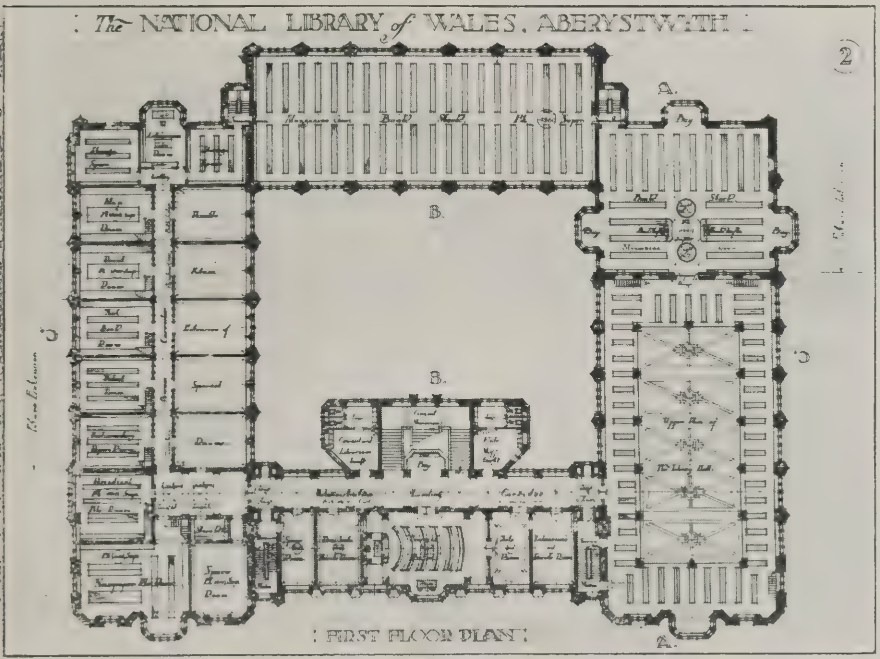
The administrative block, however, is grouped at the back, whilst the council chambers, librarian and president's rooms—which would seem to come within the category of administrative rooms—are placed upon the main part. And we cannot but regret that elevational exigencies apparently determine the disregard of the warning contained in the conditions with reference to the inadvisability of introducing sky lights. By means of these, practically the whole of the upper floor is lighted. But the gain to the elevations is, we think, it will be generally admitted, undeniable. There is a restraint of modelling, a simplicity of style and keen realisation of the possibilities of the site that give evidence of exceptional ability. The placing of the centre mass higher than is apparently required for elevation effect will be found necessary.

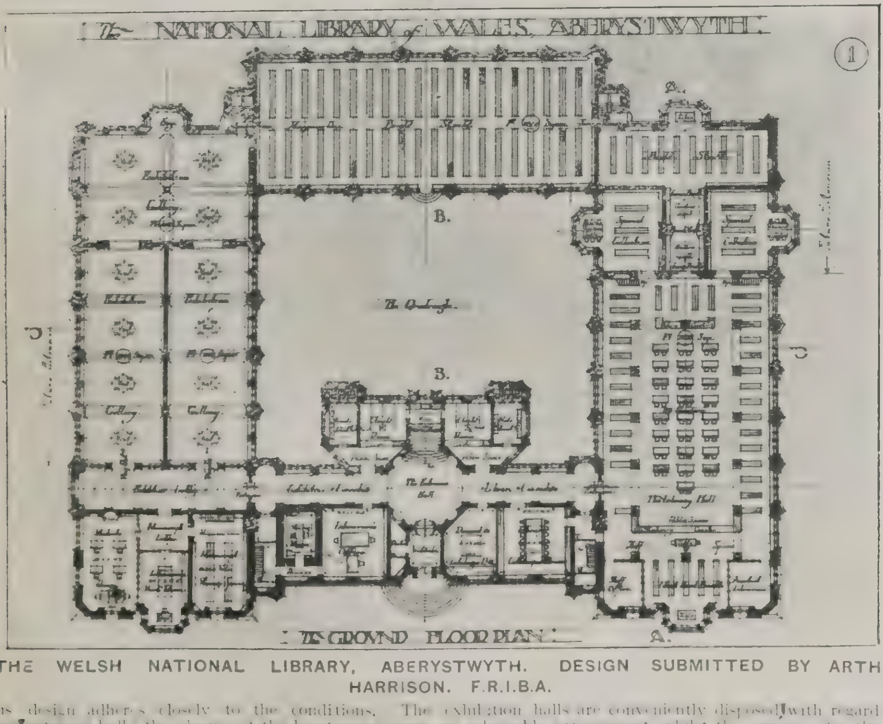


THE WELSH NATIONAL LIBRARY, ABERYSTWYTH. DESIGN SUBMITTED BY R. WYNN OWEN, A.R.I.B.A.

The main facade in the general distribution of its mass is a remarkably fine piece of work. There is a restraint of modelling, a simplicity of style and keen realisation of the possibilities of the site that give evidence of exceptional ability. The placing of the centre mass higher than is apparently required for elevational effect will be necessary in view of the inevitable foreshortening which would take place in reality.






: The NATIONAL LIBRARY of WALES . ABERYSTWYTH :
1
A.
B.
The Quadrangle
B.
C.
C.
The Library Hall
: THE GROUND FLOOR PLAN :
A.

THE WELSH NATIONAL LIBRARY, ABERYSTWYTH. DESIGN SUBMITTED BY ARTHUR HARRISON. F.R.I.B.A.

This design adheres closely to the conditions. The exhibition halls are conveniently disposed with regard to the main entrance hall; the placing of the lavatories appears an admirable arrangement, whilst the provision for the future extension book-stack has been so made as to form a pleasant composition with the side wings. The elevations admittedly reveal skill in their picturesque grouping, but we regard the effect as being marred by the introduction of a tower in the central mass, and by the over-emphatic character of the main entrance.

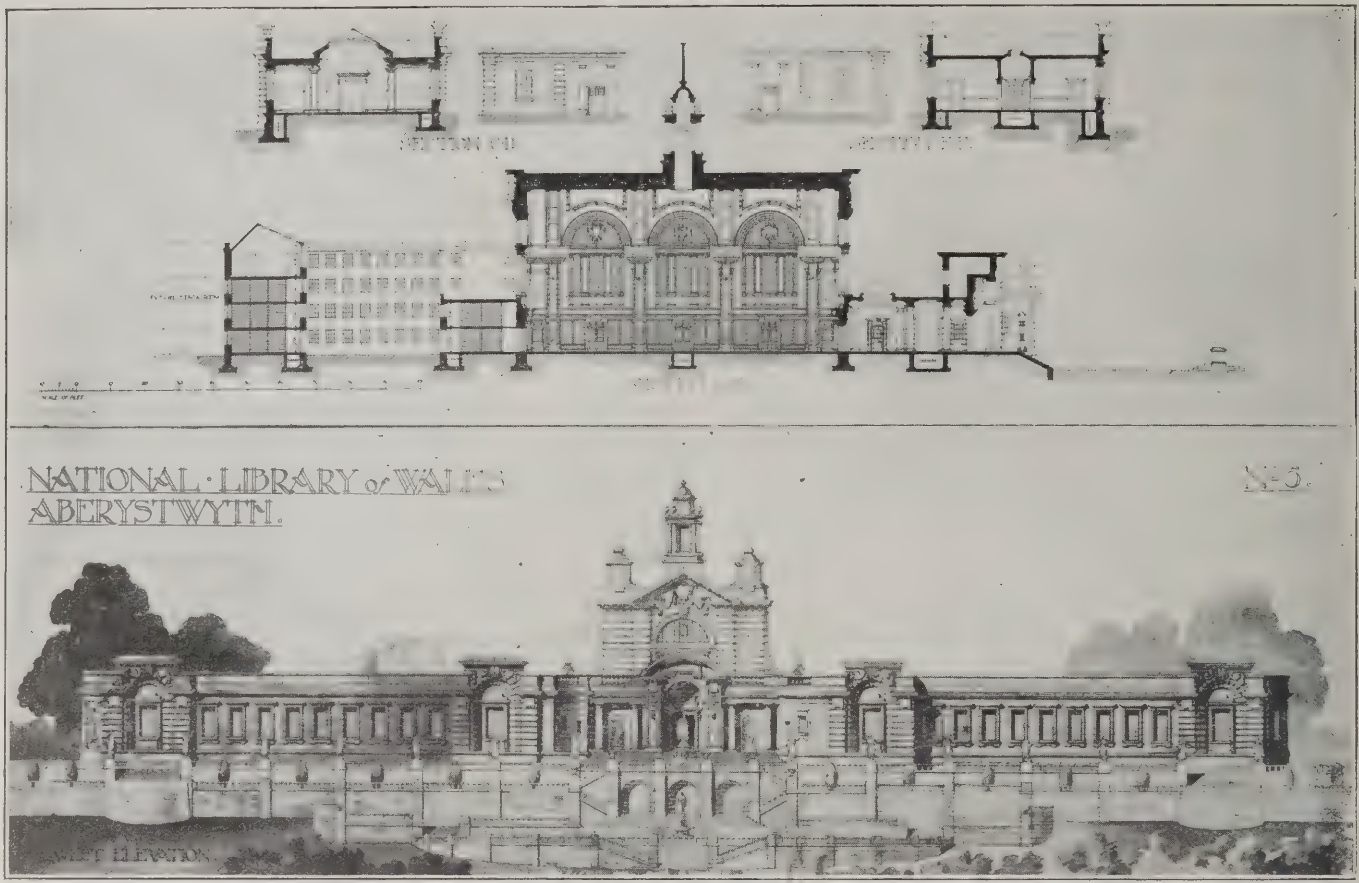
In the scheme submitted by Mr. Marshall Mackenzie, it will be seen that the exhibition block is made to balance with the square library; and though this arrangement produces a general effect of symmetry on plan, the actual sub-division of the exhibition block, and the consequent necessity for providing an area, detracts somewhat from its value. Another point which we regard as of doubtful convenience is the placing of the exhibition halls on the first floor, and the stock-rooms on the floor above. The latter are thus rendered difficult of ready access, and an adequate service of books to the reference department on the ground floor is practically precluded. Moreover the grouping of the lavatory accommodation on the ground floor, round the main vestibule would, we think, prove undesirable. The elevations do not charm us; but it must be allowed that in comparison to the run of modern library designs, they are distinguished by a certain unaffected directness.

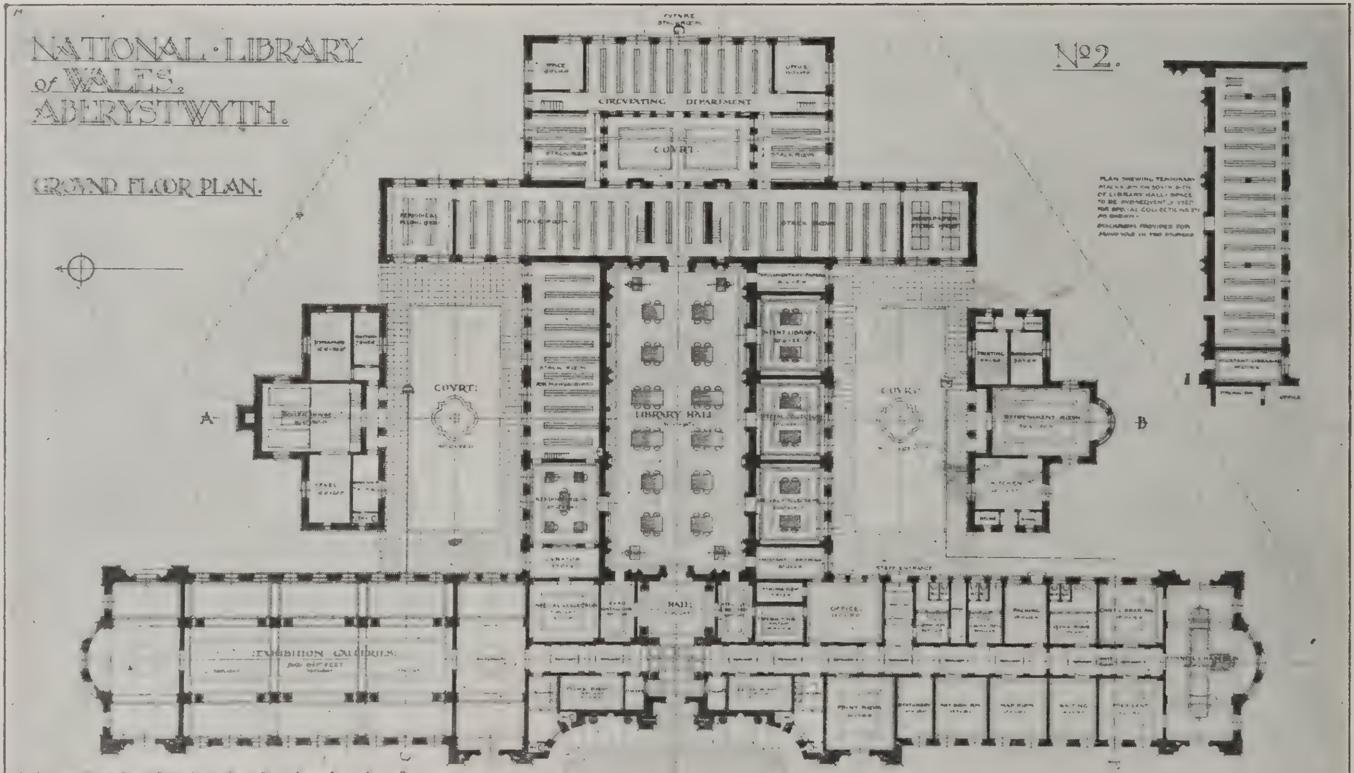
An examination of Mr. Hare's design will at once reveal its essential difference from the other arrangements submitted; the whole of the front block, containing the administration and exhibition halls, being only one storey high, and designed to compose with the central library hall, which rises above and dominates the front. A great convenience from the point of view of the public is undoubtedly the placing of the exhibition halls on the ground floor, and in such close proximity to the main entrance. But it appears to us that the general arrangement of the plan lacks cohesion; that it would compose in elevation from no point save on the centre line of the front facade. The various departments are so separated as to give a rambling appearance to the whole; and though this free disposition of the different parts has presumably been adopted to obtain practical advantages, we doubt whether the lighting of the main stack-room adjoining the library would be found to be adequate in reality. It will be observed that the elevations are conceived in the modern Renaissance manner, and that an elaborate system of terraces has been added to enhance their effect.

Studied adherence to the suggestions of the conditions seems to have been the foremost consideration in the evolution of the scheme submitted by Mr. Harrison. The exhibition halls are conveniently disposed with regard to the main entrance hall; and the placing of the lavatories throughout in a separate block projecting into the quadrangle, appears an admirable arrangement, whilst the provision for the future extension book-stack has been so made as to form a pleasant composition with the side wings. We must, however, confess ourselves somewhat out of sympathy with efforts to revive Gothic for secular purposes; and although these elevations admittedly reveal skill in their picturesque grouping, we regard the total effect as being marred by the asymmetric introduction of an unnecessary tower in the central mass, and by the over-emphatic character of the main entrance.

Messrs. Adams and Holden have produced an exceedingly skilful arrangement. The central position of the main hall, and its relation to the position of the special collections and book-stacks, seem to us highly satisfactory; and the treatment of the exhibition halls has resulted in the obtaining of very pleasant shapes, and an admirable system of circulation. The small courts on either side of the library hall are, perhaps, a little inadequate. We must congratulate the authors on the elevations, which are unusually fresh and pleasing. The colonnade *in antis* reminds us agreeably of a similar feature of Schinkel's "Altes Museum" at Berlin, and is treated in a commendably scholarly fashion.

Mr. Edward John Gregory, R.A., who has just died at Marlow, was born at Southampton in 1850, and came of a family of engineers, and was himself for a time in an engineers' office. His first contribution to the Royal Academy was a portrait in 1875. He had been president of the Royal Institute of Painters in Water Colours since 1898.





THE WELSH NATIONAL LIBRARY, ABERYSTWYTH. DESIGN SUBMITTED BY HENRY T. HARE, F.R.I.B.A.

Mr. Hare's design has essential differences from the other arrangements submitted. The whole of the front block contains the administration and exhibition halls, and is only one storey high, and designed to compose with the central library hall, which rises above and dominates the front. A great convenience from the point of view of the public is undoubtedly the placing of the exhibition halls on the ground floor, and in such close proximity to the main entrance. But it appears to us that the general arrangement of the plan lacks cohesion; that it would compose in elevation from no point save on the centre line of the front façade. The various departments are so separated as to give a rambling appearance to the whole; and though this free disposition of the different parts has presumably been adopted to obtain practical advantages, we doubt whether the lighting of the main stack-room adjoining the library would be found to be adequate in reality. It will be observed that the elevations are conceived in the modern Renaissance manner, and that an elaborate system of terraces has been added to enhance their effect.

FACTORY INSPECTION AND THE BUILDING TRADE.

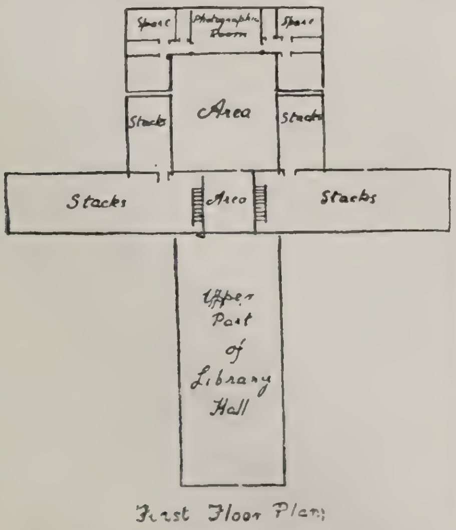
In view of the general depression in home industries, it seems a somewhat surprising statement, made by the Chief Inspector of Factories in his annual report, that the numbers of factories and workshops under inspection continue to increase. It is noted that the number of such places now stands at 260,000, and this is apart from the warehouses, docks, wharves, quays, ships, buildings, and other premises which come under the Acts for certain purposes. Although this increase has occurred in the number of places, the general slackness of trade has caused a reduction in the volume of employment, and to this is modestly attributed the decline in the year's total of accidents. The chief inspector might reasonably have claimed that some credit was due to the vigilance of his staff. Their work has now been in progress for many years, and the efforts made should certainly sooner or later show a creditable result.

So far as the building trade, with its many allied crafts, is concerned, the statistics afford useful reading. Details of the accidents that have been notified to the certifying surgeons as occurring to persons engaged in these structural processes, show that 307 have been so reported; but this number does not include the accidents which are reportable to the inspectors only. Of these no details appear to be given. A sub-division of the total reveals much that is interesting. For instance, the young persons—that is, those under 18 years of age—who met with mishaps during the year, number 22, as compared with 285 adults, the deaths being in the proportion of 5 to 109. In considering these figures, it is to be remembered that the employment of youths on buildings is extremely limited.

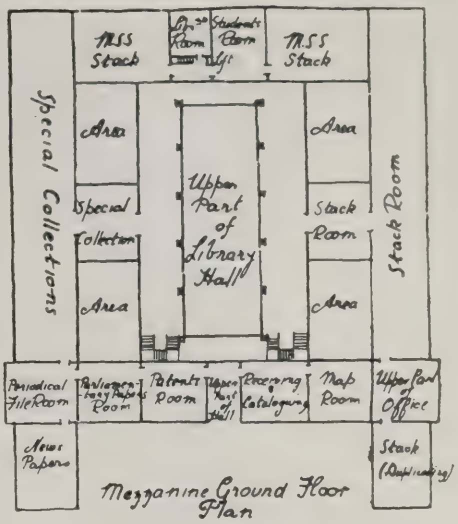
The number of accidents mentioned, viz., 307, are sub-divided under five headings, as to causation:—Machinery moved by mechanical power, 178 (17 fatal); molten metal, hot liquid, 11; explosion, 20; escape of gas or steam, 1; other causes (fatal only), 97. This list points particularly to the dangers of machinery. Such risks could be reduced by the use of rough-and-ready, but quite serviceable, fencing, that can be arranged by any practical man with the odd timbers which can always be found on a building. The general foreman is often at a disadvantage when fixing his mechanical plant, lack of necessary space being one of the principal difficulties with which he has to contend. Imperfect light is another, which adds to dangers already existing; but both of these only render the requirements of adequate safeguarding more imperative. It is mentioned that no accidents were due to electricity, which, in view of the steady growth in the use of this power, speaks well for the care with which it is handled.

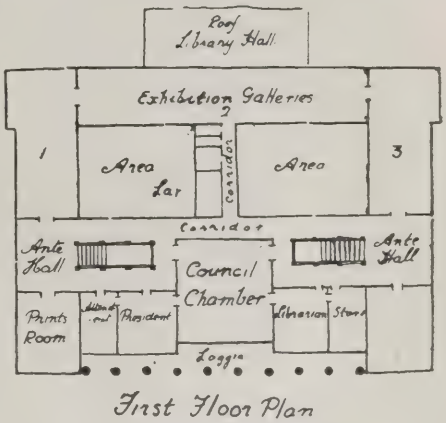
No complete tables are are given as to the incidence of lead poisoning amongst plumbers and painters. Amongst those engaged in plumbing and soldering, twenty-seven cases occurred, but no deaths ensued. The number is an increase of seven as compared with the previous year. The notification of these cases when they occur actually on a building (and the painting trade is included) is not enforceable, but nevertheless 239 were so reported, and 44 deaths are included in this number. It is apparent from this that the work performed away from the workshop must be considered the more dangerous, a fact which is probably due to the greater difficulty in giving effect to habits of personal cleanliness. It will be remembered that one of the suggestions made by the Building Accidents Committee which sat during 1907, was that for work of this description the employers should provide wash-basins, soap, towels, ets., and that the workmen should use them. The Building Operations Bill now before Parliament, also proposes that the notification of lead poisoning cases which occur on buildings shall be compulsory.

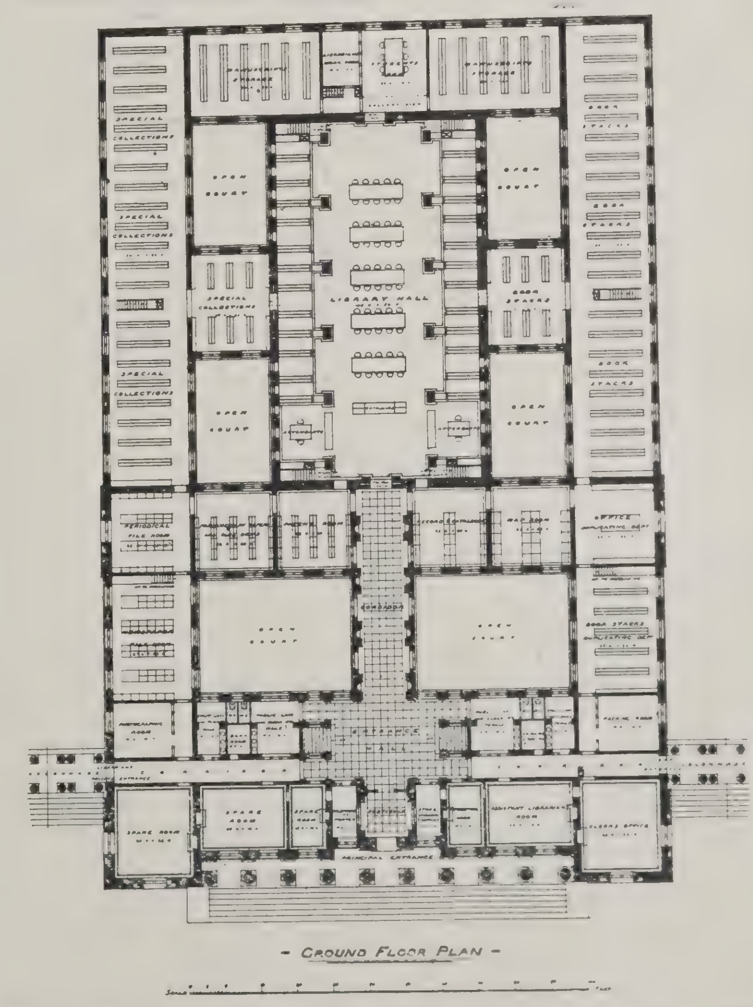
So far as the sanitation of workplaces is concerned, the superintending inspector for the south-eastern division says that, though much remains to be done, there is convincing evidence of progress. The evidence of inspectors in other parts of the country is less satisfactory. An inspector for the Midland division regrets the action of one important sanitary authority in permitting the erection of earthenware pedestal closets without the provision of a cistern to provide a proper water flush, the water having to be carried by hand. The same complaint is made of a more northerly district, with the addition that there the drains are frequently non-existent. Conferences have been held between the sanitary authorities and the oc-



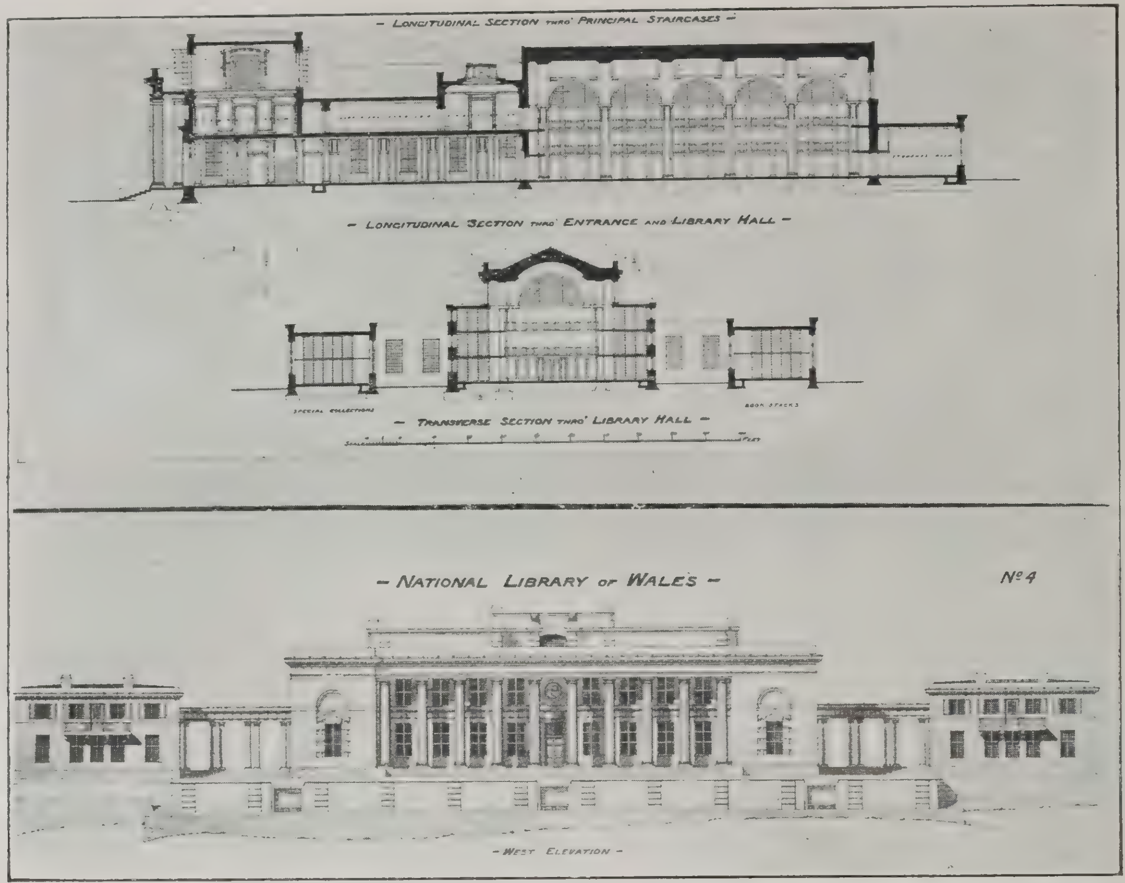
THE WELSH NATIONAL LIBRARY. SKETCH OF FIRST-FLOOR PLAN ARRANGEMENT IN DESIGN SUBMITTED BY H. T. HARE F.R.I.B.A.







THE WELSH NATIONAL LIBRARY ABERYSTWYTH. PLANS, OF DESIGN SUBMITTED BY ADAMS AND HOLDEN


– Longitudinal Section thro' Principal Staircases –
– Longitudinal Section thro' Entrance and Library Hall –
Special Collections
Book Stacks
– Transverse Section thro' Library Hall –
Scale
Feet
– National Library of Wales –
Nº 4
– West Elevation –

THE WELSH NATIONAL LIBRARY, ABERYSTWYTH. DESIGN SUBMITTED BY ADAMS AND HOLDEN.

These Architects have produced an exceedingly skilful arrangement. The central position of the main hall, and its relation to the position of the special collections and book-stacks, seem to us highly satisfactory; and the treatment of the exhibition halls has resulted in the obtaining of very pleasant shapes, and an admirable system of circulation. The small courts on either side of the library hall are, perhaps, a little inadequate. We must congratulate the authors on the elevations, which are unusually fresh and pleasing. The [illegible] colonnade *in antis*, reminds us agreeably of a similar feature of Schinkel's "Altes Museum" at Berlin, and is treated in a commendably scholarly fashion.

cupiers of premises concerned, but without immediate effect.

With regard to the Workmen's Compensation Act, an interesting point is made by Dr. Collis, a medical inspector. In dealing with lead poisoning from the smelting metals, an increase of cases is noted, and the cause of this is said to be the inclusion of this disease in the third schedule of the Compensation Act. There has been no decrease in the severity of the illnesses, and no ground for the view that malingering has played any part in the increase.

ANNUAL OUTING BATH MASTER BUILDERS' ASSOCIATION.

The Bath Master Builders' Association to the number of seventy, including the Mayor of Bath, held its annual outing at Torquay and Paignton. The visitors were welcomed by an ex-Mayor (Mr. Smerdon), and Corporation of Torquay, the Mayor and the Deputy Mayor being unable to be present. The President of the Association (Mr. F. B. Parsons) returned thanks for the cordiality of the welcome, after which the builders drove in chars-à-banc (provided by members of the Corporation) around Torquay and neighbourhood. The drive embraced Babbacombe Downs and St. Marychurch, after which the party returned to Torquay for dinner. Mr. F. B. Parsons presided, and he was supported by the Mayor of his town and several Torquay councillors and borough officials. The chairman submitted the toast, "Success to the Mayor and Corporation of Torquay." He said be had been struck very much with the fact that Torquay, like Bath, had a varied climate, so that those who desired it could obtain a mild climate. He was told that the empty houses in Torquay only averaged 2 per cent. That was very surprising, and was a testimony to the enterprise of the corporation. They were especially gratified at having among them Mr. Smerdon, because of his association with the building trade.

Mr. Smerdon, responding, said it was a disgrace to them in Torquay that they had no master builders' association, as such associations were of great value in enabling members of the trade to meet and talk over their difficulties.

The Town Clerk also replied.

The visitors motored to Paignton after dinner, where they were heartily welcomed, and games of cricket and bowls were played in Queen's Park, lent by the Urban District Council. At 5.30 high tea was served in the Cricket Pavilion, the president occupying the chair. Alderman Taylor expressed the thanks of the visitors to the Urban Council for their kindness and courtesy, and, speaking of the great growth of Paignton during the last 30 years, he said he thought the Council had consisted of men of great forethought and considerable taste.

Mr. Parnell, chairman of the Urban District Council, in acknowledging the compliment, said he was glad to see them present, because it was rumoured that the master builders of Bath had a large amount of money to invest, and there were numerous available building sites in Paignton on which it was desired to see houses erected. Paignton had been described as "the builders' paradise," and in proportion to its size he thought Paignton had done more for the building industry than any other town in the West of England. The whole of the hills in the neighbourhood could be supplied by gravitation with water of the best quality possible. The getting of this supply, however, had launched the governing body into an expenditure of no less than £150,000, and, when they considered than their rateable value was £62,000, and the population a little over 10,000, it would be seen what a large proportion of their expenditure had been in respect of water. It was not very remunerative at present, simply because it had been provided for the building sites on the hills. In this matter Paignton had launched out to help the building industry more than any other town he knew. He had no doubt that Paignton would become a second Bournemouth.

The visitors left for home about 7.30 p.m.

Buildings in Progress and Completed.

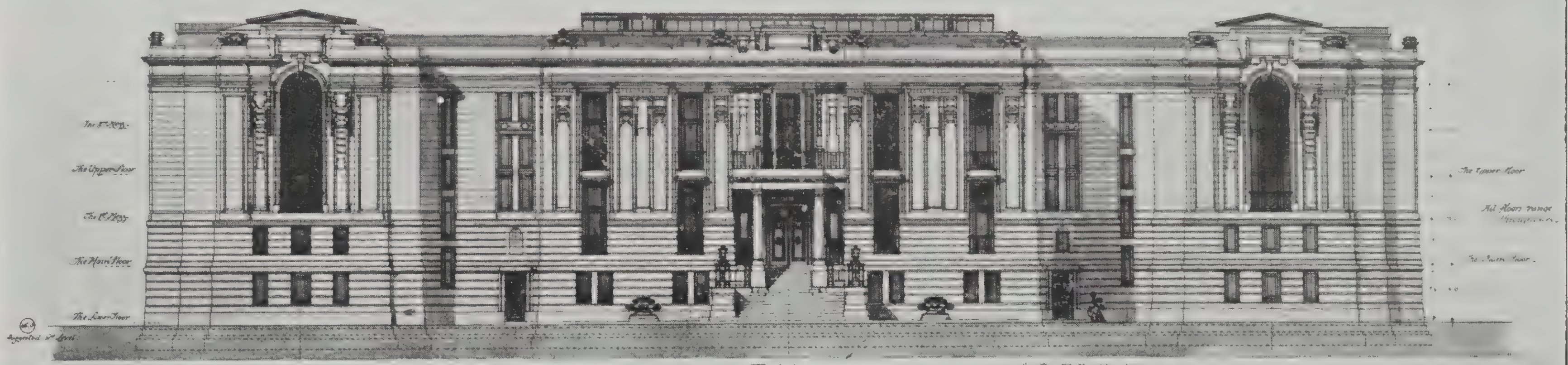
KELTY.—A new public hall is being built here at a cost of £4,500. Messrs. Andrew Scoble and Son, Dunfermline, are the architects for the hall, and the following are the tradesmen whose tenders have been accepted for the work:—Thomas Livingstone, builder, Cardenden; J. Armstrong, joiner, Kelty; A. Thomson and Co., plumbers, Dunfermline; A. E. Hutchison and Son, plasterers, Kinross; J. Paul and Son, slaters, Cowdenheath; D. Haxton and Co., glaziers, Kirkcaldy; W. Briggs, asphalte manufacturer, Dundee; Redpath, Brown and Co., Ltd., steel works, Edinburgh; James Adger, painter, Kelty; and James Combe and Son, heating engineers, Glasgow.

PINHOE.—A new Congregational Church has been erected here at a cost of £600. Messrs. Commin and Son, of Exeter, were the architects, and Mr. W. Harvey, also of Exeter, the contractor. The new building is of red brick with Bath stone dressings, and has a tiled roof.

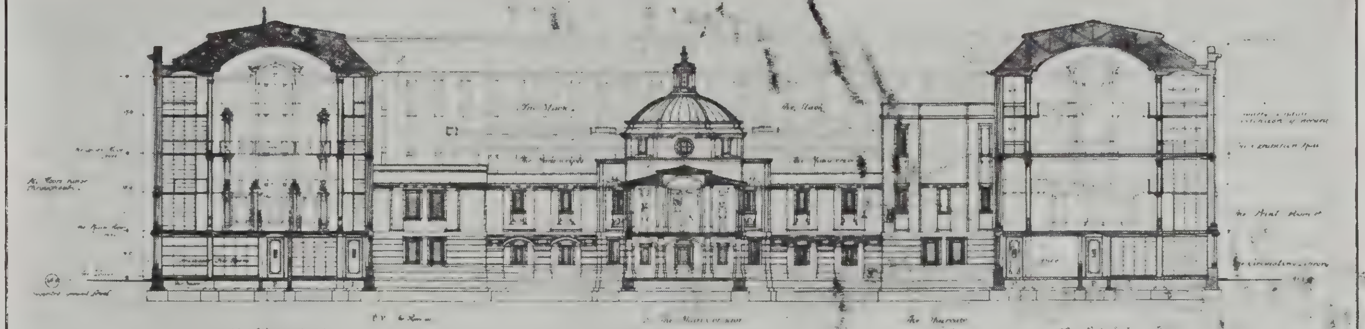
PORTSMOUTH.—The Wesleyan Sailors' and Soldiers' Home was opened by the Duchess of Albany on the 11st inst. The building is a handsome structure in red brick and stone with a main hall to hold 500, and cubicle accommodation for 104 men. Messrs. Gordon and Gunton, of London, were the architects, and Messrs. West Bros., of Rochester, the contractors. The cost was about £20,000.

REDNAL.—A public reading room and library is being erected in Leach Green Lane from the designs of Mr. Bowers, the architect, of the King's Norton Libraries.

LIBRARY
OF THE
UNIVERSITY OF ILLINOIS

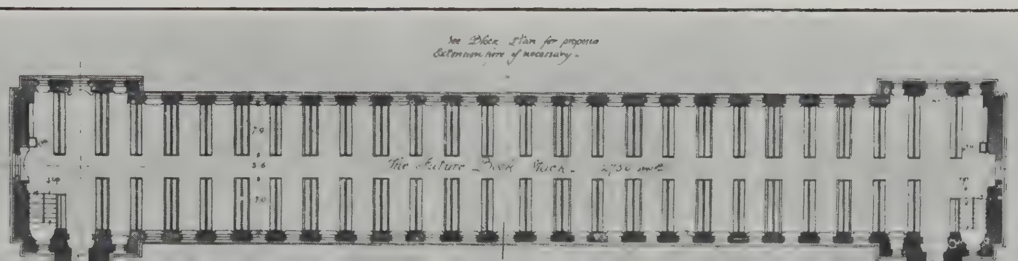


The Elevation of the Principal Front.



The Transverse Section.

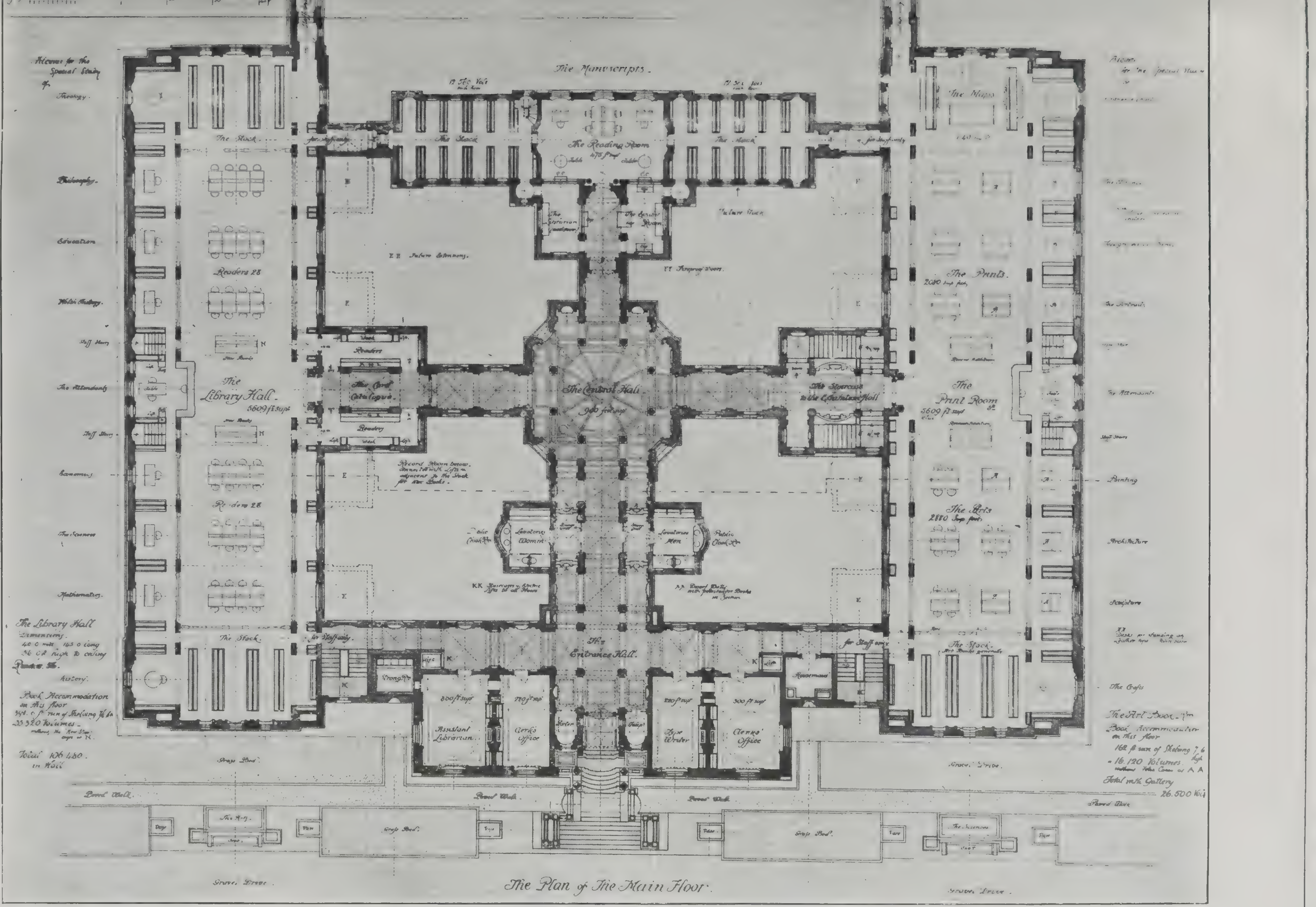
The National Library of Wales. Aberystwyth.



The Book Stack.

Book Accommodation on this floor.
330 feet run of Shelving 7.6 high
66 400. Volumes.

337,000 Vols



THE WELSH NATIONAL LIBRARY, ABERYSTWYTH. ACCEPTED DESIGN. SIDNEY K. GREENSLADE, ARCHITECT.

Notes on Competitions.

LIST OF COMPETITIONS OPEN.

Deposit for conditions given where known.

ATE OF LIVERY.	COMPETITION
July 9	PUBLIC BATHS, WOOD GREEN Architects desirous of competing are invited to send full particulars of any recent public baths designed by them, the erection of which they have supervised, stating general accommodation, cost, etc., to W. P. Harding, Clerk to the U.D. Council, Town Hall, Wood Green, not later than July 9th. From those thus applying a selection of not more than 15 Architects will be made, who will be invited to compete on certain conditions and particulars. Premiums of £52 10s., £26 5s., and £15 15s. will be awarded to the designs placed by the Assessor as first, second and third. Assessor: Mr. A. Hessell Tiltman, F.R.I.B.A. Cost not exceeding £8,000. The Council reserve to themselves the right of selecting from the premiated designs the one eventually to be erected.
July 9	STOKE-UPON TRENT. Additions to Town Hall including large hall to seat 3,000 people, police court, etc. Premiums of £100 and £50 for second and third designs respectively. Assessor nominated by Pres. R.I.B.A. Conditions and particulars from Jno. B. Ashwell, Town Clerk, Town Hall, Stoke-on-Trent,
uly 17	NEW PUBLIC BUILDINGS, BURSLEM. The Architect whose design is placed first by the Assessor will be appointed to carry out the work. Premiums of £100 and £75 to authors of second and third designs, respectively, Conditions and plan of site from F. Bettany, Borough Surveyor. Deposit, £2 2s., returnable on receipt of *bona fide* design.
uly 19	WHITLEY BAY PUBLIC ELEMENTARY SCHOOL for 600 scholars, for the County of Northumberland Education Committee. *Limited to Architects practising in the County and in the City and County of Newcastle-on-Tyne.* Particulars and plan of site from C. Williams, Secretary to the Education Committee, The Moothall, Newcastle-on-Tyne. Assessor: W.H. Knowles, F.R.I.B.A., F.S.A.
uly 30	GRIMSBY TOWN HALL EXTENSION. Estimated cost £26,000. Conditions of competition sent to any applicant on receipt of a stamped addressed foolscap envelope. Full particulars, schedule of requirements, plans of existing buildings, etc., on receipt of deposit £2 (cheques to be made payable to Frank Stephenson, Borough Treasurer), which deposit will be returned to those who send in designs, or if the whole of the particulars are sent back within ten days from the date of their receipt by the applicant. Premiums of £250, £150 and £100. An Architect of eminence will advise in conjunction with the Borough Engineer. Applications to be made to the latter, H. G. Whyatt, Assoc.M.Inst.C.E., Town Hall, Grimsby.
July 31	LAYING OUT ESTATE AT EASTWOOD, RENFREWSHIRE. The patrons of the Royal Incorporation of Hutcheson's Hospital, Glasgow, invite competitive designs for laying out for feuing and building their lands of Thornliebank, containing about 195 acres. Particulars, conditions, and skeleton plans from the Chamberlains to the Hospital, Hill and Hoggan, 194, Ingram Street, Glasgow, to whom designs are to be sent. Premiums, £100, £75, £50, and £25 for the first four designs, *which will become the property of the patrons, who will not be bound further to employ the authors.* Deposit, £3 3s.
Sept. 1	BRANCH LIBRARY, NEW CROSS, for Deptford Borough Council. Limited to Architects practising in the City or the County of London. Assessor: J. S. Gibson, Vice Pres. R.I.B.A. Premiums, £52 10s., £26 5s., and £10 10s., for three selected designs, and will be awarded in accordance with the conditions contained in the instructions to competitors. Site plan and copy of instruction from Vivian Orchard, Town Hall, New Cross Road, S.E. Deposit £1 1s., refunded on receipt of *bona fide* design or if instructions are returned within 21 days.

New School in Grove Street, Barnsley.

The award of the assessor, Mr. H. T. uckland, architect to the Birmingham Eduation Committee, was made known on Monday, the 21st instant, as follows:—1st, No. 28, £30, Mr. S. W. Dyson, Barnsley; 2nd, No. 37, £20, Messrs. Clarke and Moscrop, Darlington; 3rd, No. 21, £10, Messrs. Holtom and Fox, Dewsbury; 4th, No. 31, no prize, Mr. A. Brocklehurst, Manchester.

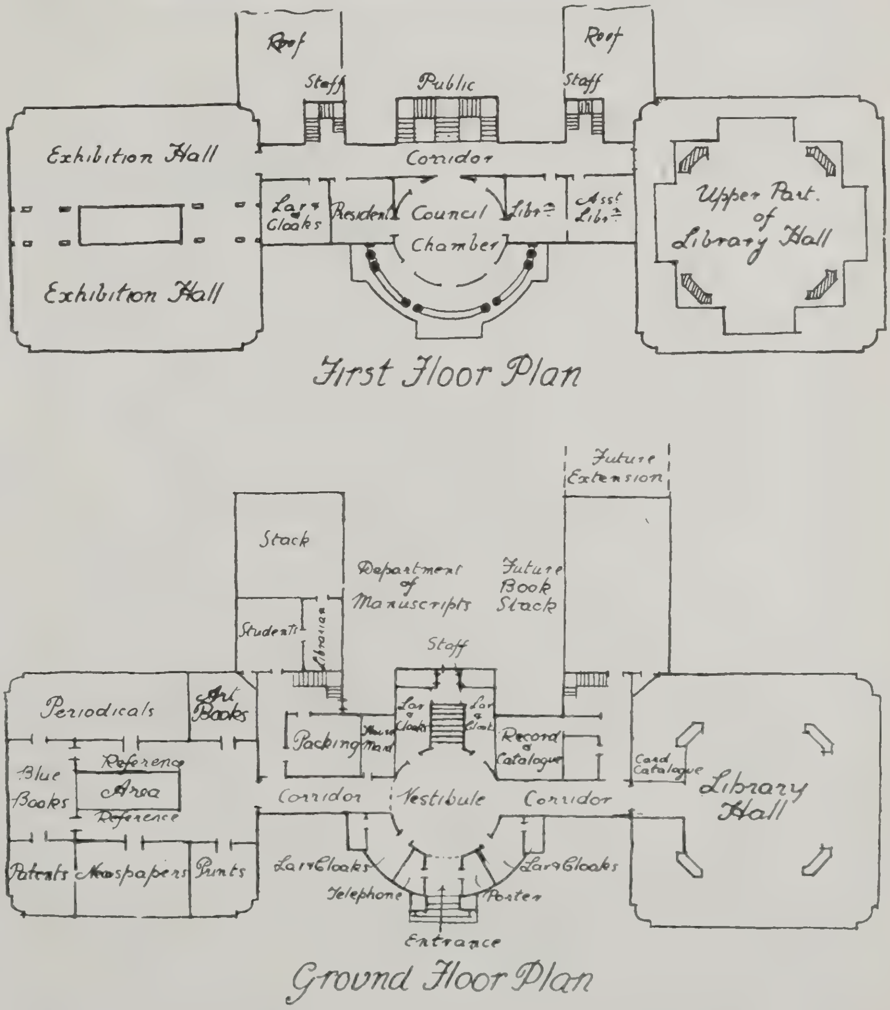
Public Baths, Wood Green.

The U.D. Council are promoting a competition for the above. Architects desirous of competing are to send in their names and particulars of their work in this class of building, by July 9th. From them a selection will be made for the competition proper. Mr. A. Hessell Tillman, F.R.I.B.A., is the assessor.

Builders' Notes.

The London Building By-laws. Part V. of the London County Council (General Powers) Bill was considered by the House of Commons Committee on Wednesday last. This part of the Bill is being opposed by the Institution of Civil Engineers, the Surveyors' Institution, and the Royal Institute of British Architects. It has for its object the amending of the London Building Acts with regard to buildings with skeleton steel framework and the use of reinforced concrete. The development of these forms of construction is hampered by the present by-laws (which the Council can in no way relax) as under these external walls must be provided of a specified thickness sufficient to carry weights on the basis of a brick and mortar construction, disregarding the essential features and advantages of both the newer forms of building, which require only thin enclosing walls to cloth the weight-carrying structure. The Bill provides for more rigid inspection by the Council's officers, including not only the external walls, as at present, but also the internal steel construction. The professional bodies mentioned are opposing some details of the proposed inspection, but their great objection is to the proposed arrangements for appeal in case of disagreement between the Council's district surveyor and the builders or architects. As the Bill is drawn, the Building Act Committee of the Council, advised by the Council's architect, is to be the final court of appeal. It is obvious that this is merely an appeal from the Council to the Council, or from one official to another, and it is not surprising that the professional bodies concerned should oppose such an arrangement. The Parliamentary Committee of the county council have now saved the situation—and probably the Bill—by proposing as an alternative that appeals should be made to the Tribunal of Appeal as constituted under the Building Acts. This tribunal consists of an architect, a lawyer, and one other, and can call in an engineer as an assessor. It has worked well in the past, and we doubt not that its adoption as the Court of Appeal in the provisions of the new Bill will be satisfactory to the opponents of that measure. The new procedure will be an expense to the council, who have to pay all cost of the tribunal; but the previously suggested arrangement was, on the face of it, inequitable.

Builders and the Budget. A deputation of the Bradford and District Master Builders' Association, consisting of Alderman Gadie, Councillor Dickinson, and Mr. Percy Fox, on the introduction of Sir G. Scott Robertson, M.P., laid before the Chancellor of the Exchequer on the 24th inst., the case of a

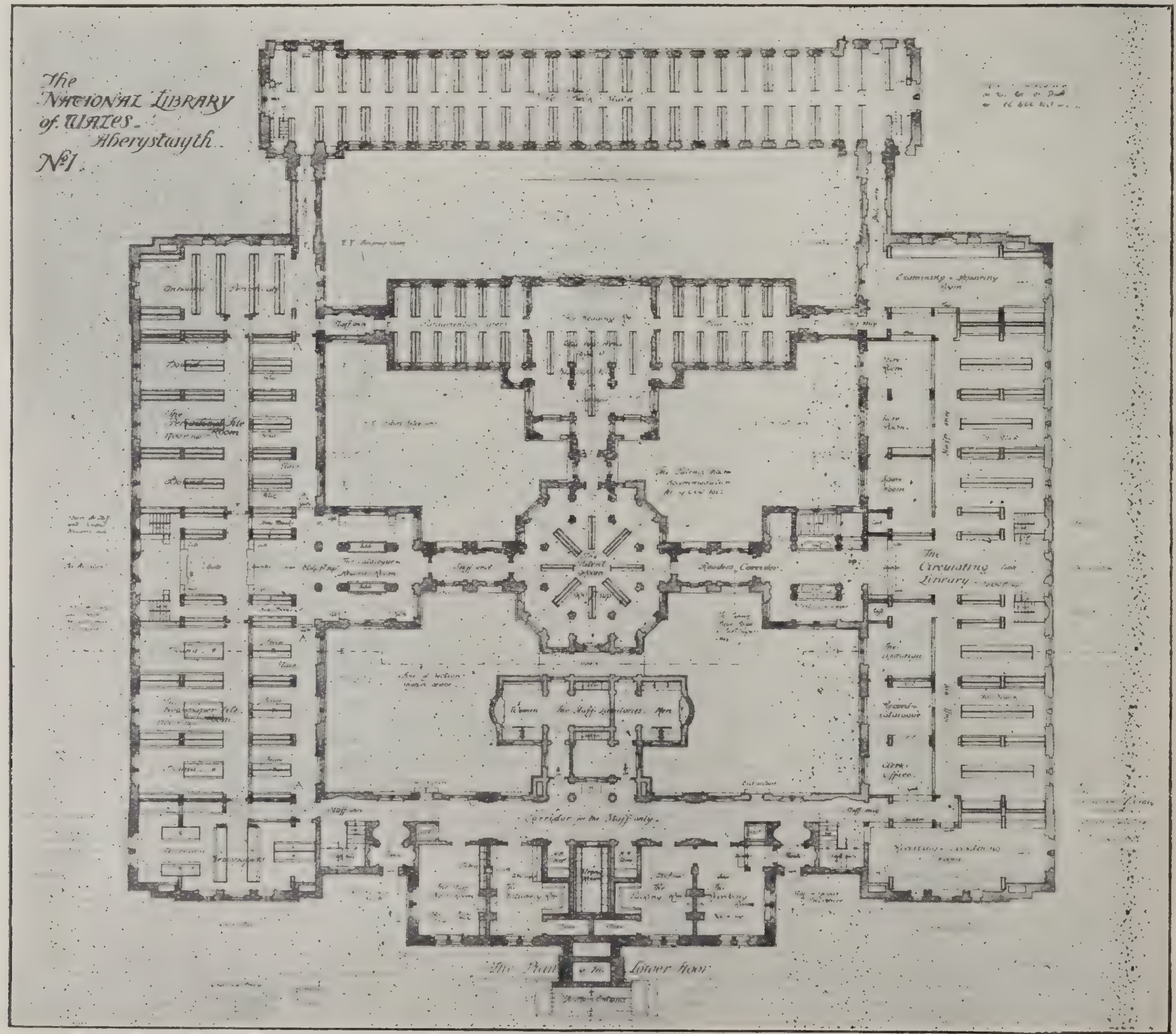


THE WELSH NATIONAL LIBRARY, ABERYSTWYTH. SKETCH PLANS OF DESIGN SUBMITTED BY A. MARSHALL MACKENZIE, A.R.S.A., AND SON.

In this scheme it will be seen that the exhibition block is made to balance with the square library; and though this arrangement produces a general effect of symmetry on plan, the actual sub-division of the exhibition block, and the consequent necessity for providing an area, detracts somewhat from its value. Another point which we regard as of doubtful convenience is the placing of the exhibition halls on the first floor, and the stack-rooms on the floor above.

builder buying land as in some sense a raw material of his business—possibly borrowing some part of the purchase money on mortgage—with no intention of holding the land up, but with a view to its development, and with every desire to get rid of it. Would the Chancellor of the Exchequer consider it employed or unemployed land if the builder developed it, say, to the extent of 20 per cent. of its possibilities? Again, would he take the actual purchase value and have that registered as the basis of taxation? The Chancellor of the Exchequer promised every consideration, and the delegates expressed their pleasure at the manner in which Mr. Lloyd-George had received them. Mr. Lloyd-George also expressed his satisfaction at the clear and forcible way in which the Yorkshiremen stated their case. The reports which reach us from architects and builders on the land taxation proposals are gloomy in the extreme. The Budget has had the effect of thoroughly frightening prospective building owners, and architects, already hard hit by trade depression, are deploring their losses on many schemes for houses which have been postponed or abandoned. Builders, too, report having submitted estimates which have been provisionally accepted and are now cancelled. One builder this week informs us that he lost three contracts last week in this way. It may be urged that this is needless panic, and not justified by anything in the proposals of the present Government; and that time will gradually see confidence restored. The trouble is that architects and builders have been suffering from depressed trade for several years and have all they can do to make a living at present. The particularly regrettable point about the land taxes is their tendency to militate against gardens, especially in or near towns. If garden areas, above one acre in extent, in the neighbourhood of towns, are to be taxed as building land, many fine gardens will disappear, and others will be prevented from ever appearing. It is hard enough to find suburban houses with decent gardens at the present day; and the possible restriction of gardens at a time when we are earnestly considering the question of town planning and of increasing rural conditions in our suburban districts, is a deplorable outlook. It must not be forgotten that though the man who lays out a garden and plants trees may derive an increment value for his land from the proximity of his fellow-men, he is also a public benefactor. Of course he may escape the tax by throwing open his grounds to the public; but those men who do, and they are not a few, know to their cost how ungrateful the public often is, and how much wanton damage is done to their grounds in consequence.

Employment in the Building Trade. Employment was, according to the "Labour Gazette," generally slack in May except among the painters, who were fairly well employed. It was better than a month ago, but showed little change on the whole compared with a year ago. Among trade union carpenters and joiners, the percentage of unemployed was 8.8, as compared with 11.0 a month ago, and 9.1 a year ago, and for plumbers at the same dates the percentages were 14.1, 14.0, and 14.3 respectively. With carpenters and joiners the percentage unemployed showed a decline in every district compared with the month previous, and in nearly every district compared with a year ago. For London the Trade Union returns show that 9.2 per cent. of carpenters and joiners were unemployed at the end of May, as compared with 10.3 a month ago, and 13.4 a year ago; the corresponding percentages for plumbers were 17.1, 11.7, and 16.2. Employment remained slack, except with painters, in nearly every large centre, but showed an improvement compared with a month ago. It was fair with bricklayers at Middlesbrough, Hartlepool, Stockport, Northwich, the Potteries, Wolverhampton, Ipswich, Plymouth, and Paisley, with masons at Dundee, Aberdeen, and Blackpool, and in South Wales, and with carpenters and


The National Library of Wales - Aberystwyth No 1.
The Circulating Library
Readers Corridor
Corridor for the Staff only
Women
Men
The Main Lower Floor

THE WELSH NATIONAL LIBRARY, ABERYSTWYTH. FIRST FLOOR PLAN OF ACCEPTED DESIGN.
SIDNEY K. GREENSLADE A.R.I.B.A., ARCHITECT. *(For ground floor plan and elevation, see Centre Plate.)*

[Without doubt, Mr. Greenslade's is the most logical and scientific solution of the problem. He has wisely fallen in with the suggestion embodied in the conditions regarding the disposition of the administration block, which forms in his design the outstanding feature of the main façade. The access throughout appears to us to be all that could be desired, and the distribution of the books in the library hall very satisfactory.

joiners at Doncaster, Blackpool, Warrington, Chorley, Stockport, Derby, Mansfield, Newark, Lincoln, Cambridge, Ipswich, Swansea, Aberdeen, and Cork. With carpenters at Hull it was good. It declined with plumbers in the Northern Counties, with carpenters at Leicester, and with masons at Plymouth.

Enquiries Answered.

Correspondents are particularly requested to be as brief as possible. The querist's name and address must always be given, not necessarily for publication.

The Editor is willing to answer enquiries from readers who require information on architectural, constructional, or legal matters. Such information must be regarded as the gratuitous advice or information of a friend, and not as the professional opinion of one who holds himself out as possessing expert knowledge on the subject in question. The Editor will, however, avail himself of the assistance of a large staff of experts in the matters above mentioned, but enquiries sent must be on the express understanding that he is not to be held responsible for any delays, mistakes, inaccuracies, or negligences which may occur.

Enquirers whose questions involve possible legal proceedings are strongly urged to consult their solicitors before taking definite steps in regard thereto.

Answers by post will be sent if the enquiry is accompanied by a postal order for 1s. made payable to Technical Journals, Ltd., and crossed, and a stamped addressed envelope. Such enquiries must be marked "Answers by Post" on the outside cover.

This fee of 1s. required for answers by post is in no case to be regarded as payment for the answer given, but merely as a registration fee to meet the extra clerical and other expenses incurred in dealing with these special replies.

The Editor also reserves the right of refusing to reply to any question that he may deem to be unreasonable or unsuitable; and it must be understood that both question and reply will, as a rule, be published in these columns.

A Question of Extras.

LIVERPOOL.—X. Y. Z. writes: "In a specification for alterations there is this clause: 'All work reasonably to be inferred from the drawings is to be executed whether specified or not.' Can the builder, under the circumstances, claim for lath and plastering under new stairs, and other very small items as an extra? The builder examined the premises with plan and specification before tendering."

To a very large extent this depends on whether any special instructions were given for the execution of the particular work in question. If the employer left the builder to carry out his contract, merely inspecting and never giving orders or making alterations, there is no doubt whatever that this work is included in the contract, and that no extras are payable. If an architect has been employed, it will be for him to decide whether the extras charged for are reasonable or otherwise, and he will issue his final certificate accordingly.

F.S.I.

Footings and the Boundary Line.

WALES.—A. writes: "When building close up to a boundary between two pieces of unoccupied land, has the builder the right to project his footings on to the adjoining land in spite of the protest of the adjoining owner, or must he set the face of his wall back to allow the whole of the footings to rest on his own land?"

When building close up to his boundary, an owner must respect his neighbour's property in exactly the same way as he does so for all other purposes. The projection of the footings of a wall forms quite as clearly an encroachment as if the wall were entirely built on the adjoining owner's land—it is only a question of degree. You should so form your footings that on the outer side they are flush with your wall face, and you must also take care, at the top, that the coping, or other finish, is also within your boundary.

F.S.I.

Rights of Adjoining Owner.

In further reply to W. H. S. (see p. 497 of the issue for May 26th), this is purely a legal question, and can only be answered by a solicitor on the spot, who has all the documents before him. Unless B.'s "assignment" is of such a nature as to act as a conveyance of A.'s interest, I do not think that it can hold good as against the second mortgagee. But it must be remembered that the second mortgagee has no claim to handle any rents or profits unless his interest is in arrear, and he has exercised his powers of foreclosure under the mortgage deed.

F.S.I.

Insurance of Buildings in Course of Construction.

ESSEX.—ENQUIRER H. writes: "In whose name should a fire-insurance policy on a building in course of erection be taken out?"

The fire insurance policy upon a building which is in course of construction is usually issued in the joint names of the employer and of the contractor, the document itself being in the custody of the architect. The R.I.B.A. conditions of contract (sanctioned May 13th, 1895) incorporate a proviso to this same effect, (Clause 22).

F.S.I.

Meaning of Term "Flatting."

ESSEX.—ENQUIRER H. writes: "Please explain the meaning of the term 'flatting' as applied to painting."

"Flatting" consists in leaving the finishing coat of paint in a "flat" condition (not glossy). It is not considered to be sufficiently impervious for outside work, but is useful internally when finishing uneven surfaces, because it does not show up the inequalities as an oil or varnish coat will do.

F.S.I.

Trade and Craft.

Electric Lifts.

A useful catalogue, dealing specially and exclusively with lifts that are worked by electric power, has been issued by Messrs. R. Waygood and Co., Ltd., Falmouth Road, London, S.E., in which very full information is given as to methods of driving, methods of control, and the means adopted of ensuring perfect safety. Illustrations are given of various interesting installations of the firm's passenger or goods lifts, and the views include the new War Office, Whitehall; Baltic House, Leadenhall Street; the new Sessions House, Old Bailey; Buckingham Palace; Bournemouth and Ramsgate cliffs; and the liners "Mauretania" and "Amerika," etc.

Oak Panelling and Joinery.

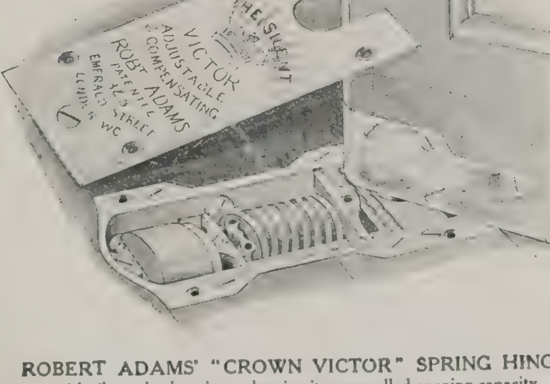
Some excellent examples of interior woodwork are shown in a catalogue that has just been issued by Messrs. Hofler, Ltd., of 226a, Soho Square, W. Many specimens of plain and decorative panelling in Austrian oak are shown, as well as a number of designs of Austrian oak chimney-pieces. Not the least interesting nor the least numerous illustrations are those of work that has been executed by the firm. These include some very delicately and elaborately carved church work, as well as less ornate panelling, doors, and screens, in hotels and private houses. The designs of several eminent architects are represented.

Reconstructed Building Stones and Marble.

A distinction is drawn between what is known as ordinary artificial stone and that which is called reconstructed stone. The latter contains no cementing medium other than that found in the natural stone. The British Stone and Marble Co., Ltd., Ponders End, Middlesex, who lay stress on this distinction, state that in their process of manufacture quarry débris is calcined in closed retorts, the carbonic acid gas generated being collected and liquefied, and the lime so obtained is mixed with a certain proportion of the stone to be reconstructed, such stone being reduced by crushing and screening to its original grains. The material is then conveyed to a rotary drum, and after being thoroughly mixed is hydrated. The mass is pressed, when a density can be given to it equal to or higher than that of the best stone. Whilst it is in a plastic state, the product is fashioned to the required form. After being worked, it is placed in cylinder, where, a vacuum being created, the carbonic-acid gas previously extracted is fed to it, permeating the entire block, and making it crystalline throughout. The product is entirely free from lamination, the entire stone being homogeneous throughout, and containing no bedding planes, while any desired density can be secured, so that the lower courses of a building may be made of high weight-carrying capacity, while showing no difference in colour and formation from the upper courses. Mr. T. Allen Howe, curator of the Geological Survey and Museum, Jermyn Street, having examined microscopically the company's products, finds that it is by no means easy to distinguish between the natural and the reconstructed stone, but that the latter is superior in compactness, density, and crystallisation. Messrs. David Kirkaldy and Son have reported very favourably as to its resistance to crushing stress, etc.; and the firm are able to refer to important buildings in which their products are being used.

ROBERT
ADAMS,
Engineer :: Patentee :: Manufacturer
3 & 5, EMERALD ST.,
LONDON, W.C.

PANIC BOLTS
FANLIGHT OPENERS
GEARING
REVERSIBLE
WINDOW FITTINGS
WEATHER BARS
Including the "DURABAR" Patterns.
METAL CASEMENTS
CASEMENT BOLTS
LOCKS and FURNITURE



ROBERT ADAMS' "CROWN VICTOR" SPRING HINGE,
with silent check action—showing its unequalled opening capacity.

SPECIALIST
for the Complete Equipment of
DOORS and WINDOWS.

60 HIGHEST AWARDS.

The Patentee and . .
Leading Maker of . .
the Screwed Rod and
Regulator System of
Ventilating Gearing.

— See Page 705 for —
GEARING, FITTINGS, &c.
Please Write for New Catalogue.
15 GOLD MEDALS AWARDED.

THE NATIONAL FEDERATION OF BUILDING TRADE EMPLOYERS OF GREAT BRITAIN AND IRELAND.

OFFICERS, ETC., 1909.

President:
ERNEST J. BROWN (LONDON).

Senior Vice-President:
COUNCILLOR S. SMETHURST, J.P. (OLDHAM).

Junior Vice-President:
J. W. WHITE (SUNDERLAND)

Hon. Vice-Presidents:
ROBERT NEILL, J.P. (MANCHESTER).
J. HOWARD COLLS (LONDON).
COUNTY ALDERMAN J. BOWEN, J.P. (BIRMINGHAM).
T. F. RIDER, F.R.G.S. (LONDON).
J. STEVENSON JONES (LIVERPOOL).
ALDERMAN W. HOLDSWORTH, J.P. (BRADFORD).
A. KRAUSS (BRISTOL).
B. I. GREENWOOD (LONDON).
C. W. GREEN (LIVERPOOL).
ALDERMAN W. H. JESSOP, J.P. (HUDDERSFIELD)
WM. SHEPHERD (LONDON).
GEO. MACFARLANE (MANCHESTER).
WM. NICHOLSON (LEEDS).
C. H. BARNSLEY (BIRMINGHAM).

Hon. Treasurer:
JAMES WRIGHT (NOTTINGHAM).

Hon. Auditors:
F. HIGGS (LONDON) AND W. THOMAS (CARDIFF)

Representatives on the Employers' Parliamentary Council:
ERNEST J. BROWN (LONDON).
WM. SHEPHERD (LONDON).

ADMINISTRATIVE COMMITTEE.

Ex-officio Members:—The President, Vice-Presidents, Hon. Treasurer and Hon. Auditors.

ELECTED MEMBERS.

Northern Centre—T. WILKINSON (Middlesbrough). W. R. THOMPSON (Dewsbury). GEORGE MACFARLANE (Manchester) JAS. STORRS, J.P. (Stalybridge).

Midland Centre—H. WILLCOCK (Wolverhampton). ALBERT S. SMITH (Birmingham).

South-Eastern Centre—WM. SHEPHERD (London). W. F. WALLIS (Maidstone). B. I. GREENWOOD (London). J. BELL, J.P. (Cambridge).

South Western-Centre—Coun. W. N. BLACKBURN (Newport, Mon.). E. J. NEALE (Bristol).

Secretary:
A. G. WHITE, 31 and 32, Bedford Street, Strand, London, W.C.

OFFICIAL REPORTS.

THE NATIONAL FEDERATION.

Meetings of the Journal Committee and Administrative Committee were held on June 22nd, and a meeting of the National Board of Conciliation on June 23rd.

Conditions of Contract and Conditions in Quantities.

The attention of the R.I.B.A. and of the Quantity Surveyors' Association has been drawn to what appears to be a growing practice of stating at the beginning of bills of quantities that the conditions of contract will be those agreed between the R.I.B.A. and the Builders' Institute, the while subsequent conditions are inserted in the quantities which vary the said agreed conditions of contract. As those subsequent conditions are probably repeated in the specification, there is danger that a confusion will arise which would make it extremely difficult to say what are the exact terms of the contract between the parties.

The Quantity Surveyors' Association, in reply, say they cannot understand how the inconsistency of which complaint is made can possibly arise when the quantities are prepared by a reliable surveyor. They express themselves quite in accord with us in deprecating such a practice, and will use their influence wherever practicable with a view to effecting its discontinuance.

The R.I.B.A. have published the communication in their journal for the information of their membership.

Home Office Departmental Committee on Lead Poisoning.

On May 17th, a communication was received from the Home Office saying that it was proposed to appoint a Departmental Committee to consider the question of lead poisoning in the painting and plumbing trades. The Federation was requested to communicate with the bodies concerned, and the London Association appointed their president, Mr. F. G. Rice, the National Painters' Association their secretary, Mr. W. G. Sutherland, of Manchester, and after consideration of the names suggested by our County Federations, the president selected Mr. J. W. Bellamy, of Birmingham, to represent this Federation. These names with addresses have been duly forwarded to the Home Office. As the operatives concerned will bring forward evidence tending to show the necessity for restrictions and regulations relating to the use of poisonous paints, the employers will have to be prepared with rebutting evidence or their case may suffer. It would be well, therefore, for the County Federations and local associations to be inquiring as to suitable witnesses in readiness.

Half-yearly Meetings.

The arrangements for the above meetings at Portsmouth are as follows:—

Tuesday, July 20th.—2.30 p.m., Council Meeting in Grand Jury Room, at the Town Hall.

Wednesday, July 21st.—10.30 p.m., General Meeting in Grand Jury Room at the Town Hall; after the meeting luncheon will be provided, for the members attending, in the Mayor's Banqueting Room, Town Hall. After lunch it is proposed to make up a party to visit the dockyard and be shown over the "Vernon" Torpedo Depot (by special permission of the Commander-in-chief).

The Queen's Hotel, Southsea, will be the headquarters, and a special tariff has been arranged. Rooms should be booked early.

The Annual Conference of Secretaries,

it is proposed, shall take place at Leeds, on Tuesday, October 19th, and a preliminary notice stating the fact and requesting suggestions for subjects and papers for the agenda has been issued.

The Proposed International Federation for the Building Trade.

In accordance with the instructions of the Committee, the secretary attended a meeting in Brussels of the Committee charged with drawing up a constitution for the proposed Federation. Delegates also attended from Belgium, Holland, Italy, Hungary, and France. The secretary secured the assent of the Committee on two points which appear to be of primary importance for the success of the contemplated Federation; one, that the annual subscription should be fixed for the present at 10 centimes (or approximately 1d.) per member; the second, that at future International Congresses other languages than French should also be recognised, and interpreters provided, so that delegates might address the congress in one of the four principal European languages. For the Executive Council, however, French would still be used.

Belgian Builders' League.

On April 24th and 25th, the above league celebrated the 25th anniversary of its foundation, and as the event coincided with the meeting of the Committee just referred to, its members were invited to assist at the festivities, which took the form of a theatre party, and a banquet attended by some 270 guests. The proceedings were highly successful in every way, and the foreign delegates were most hospitably entertained.

Organisation.

The Reading builders were invited to meet the president and secretary, to confer as to the advisability of forming a builders' association for that district. The response, however, was so unsatisfactory, that the meeting was reluctantly abandoned.

A similar attempt at Tunbridge Wells has met with hardly any better success. A small number of employers attended the first meeting, but the second meeting was a failure, only one attending, although about 10 promised to do so.

The secretary again visited Bournemouth and addressed a well-attended meeting of the local association, on the question of affiliation to the Federation. No decision was come to then, but a postal vote is being taken, and the result will be known very shortly.—A. G. WHITE, Secretary.

The Northern Centre.

The Yorkshire Federation.

The monthly meeting of the Executive Council of the Yorkshire Federation was held at the Liberal Club, Barnoldswick, on Thursday, June 17th, 1909. Mr. W. R. Thompson (president) occupied the chair, and was supported by 34 delegates from federated associations.

A letter was read from the secretary of the York Association stating that he had been requested at a general quarterly meeting to convey the thanks of the association to the Yorkshire Federation for the prompt and valued assistance given in the case of one of the members, which had been much appreciated and was gratefully acknowledged.

The treasurer reported receipt of sums amounting to £67 8s., including £30 transferred from insurance account. The Finance Committee reported that they had examined the accounts, and recommended payment.

On the motion of Mr. A. Moulson, seconded by Mr. H. Fallas, the travelling expenses of representatives of the Federation, having been examined and certified as correct, were approved for payment as follows :—

National Federation and Northern Centre		£14 12 4
National Conciliation Board	£12 3 4	
Northern Centre ,, ,,	5 14 11	
		17 18 3
Finance and Emergency Committee		1 4 10
		£33 15 5

Mr. Sinclair stated that he and the secretary while in London had made the final arrangement with Lloyds to continue the Federation scheme of insurance for another year, in accordance with the terms approved by the Federation.

A letter was read from the National secretary asking whether the Federation desired any action to be taken by the National Federation in regard to the Finance Bill. On the motion of Mr. A. Moulson, seconded by Mr. G. Rayner, a resolution was passed expressing the opinion that the land taxation clauses of the Finance Bill are likely to have a serious detrimental effect on building operations, and still further to accentuate the prevalent unemployment in the trade.

A letter was read from the Hull Association expressing the opinion that it is desirable that the Builders' Labourers' Federation should be admitted to the Conciliation Boards on the same conditions and with the same privileges as the other operative societies. The Federation secretary had written in reply pointing out that the National Federation had recommended that builders' labourers be admitted to the local Conciliation Boards in all towns where working rules had been mutually entered into between the labourers and the employers. The difficulty in admitting the labourers to the full benefit of the National scheme was that 20 or 30 societies claimed to represent the labourers, not one of which was sufficiently strong in numbers or in influence to be considered as representative. An effort to combine these societies for Conciliation purposes, and to appoint representatives on the National and Centre Boards, had not been successful. On the motion of Mr. W. T. Ledgard, seconded by Mr. T. E. Taylor, the reply of the Federation secretary was approved.

Mr. A. W. Sinclair gave a report of the proceedings of the annual meeting of the National Conciliation Board, including revision of rules, application of builders' labourers for admission to scheme, etc.

Mr. W. R. Thompson gave a report of the proceedings of the meetings of the Northern Centre Conciliation Board held on June 9th and 16th. Representatives and secretaries were requested to note the following appointments of the National Federation :—

National Administrative Committee [held last Tuesday, in London]. Executive Council, Portsmouth, July 20th, at 2.30 p.m. Half-yearly General Meeting, Portsmouth, July 21st, at 10.30 a.m.

Attention was drawn to the case of a builder who had been refused payment in full of a certificate granted by the architect. The matter is receiving careful consideration.

It was reported that Mr. Hope, solicitor, of Sunderland, had forwarded for the consideration of the Federation a copy of a form of sub-contract which had been drawn up by his firm, and approved and settled by Mr. A. A. Hudson, barrister-at-law, a leading authority on building contracts. On the motion of Mr. J. H. Tomlison, seconded by Mr. W. T. Ledgard, it was resolved to forward a copy of the suggested form of subcontract to the local associations and request them to favour the Federation with their observations thereon not later than July 7th if possible.

Mr. A. W. Sinclair opened a most interesting and instructive discussion on his recent visit to Germany under the auspices of the Housing Reform Council. His observations were supplemented by County Councillor J. Midgley and Councillor J. Dawson. Information was given, among other matters, as to the cost of sites under municipal town planning, the rent of tenement dwellings occupied by the working classes, and the effect of this system and consequent overcrowding on national physique and infantile mortality. A statement of the low rate of wages and long hours of labour prevailing both in Germany and Belgium compared most unfavourably with those obtaining in England. On the motion of the president, seconded by Mr. R. Raper, the best thanks of the Federation were tendered to Mr. Sinclair for the valuable general and trade information with which he had favoured the members.

It was resolved, on the motion of Mr. A. W. Sinclair, seconded by Councillor J. Dawson, to hold the next meeting of the Federation at Scarborough on Friday, July 16th.

The president and members of the Barnoldswick Association afterwards entertained the members to tea, and a hearty vote of thanks was accorded to them for their generous hospitality.—J. Davidson, Secretary, 14, Park Row, Leeds.

Northern Counties Federation.

SUNDERLAND AND DISTRICT ASSOCIATION.

Secretary: W. H. Hope, Solicitor.

At the annual meeting of the Sunderland and District Conciliation Board for the Building Trades, held in the Board Room, 14, Norfolk Street, Sunderland, on Thursday, June 10th, 1909,

Mr. F. W. Ranken proposed the re-election of Councillor Geo. Swan as chairman, and Mr. Geo. Johnson as vice-chairman, positions which they had now occupied for three years. This was seconded by Mr. Geo. Urwin, and carried unanimously. Councillor Geo. Swan, in returning thanks for his re-election, said that his duties in the past had been very light, and the meetings had been characterised by a feeling of good-fellowship, which he hoped would be continued. Mr. Johnson, in thanking the Board for his re-election, said that he quite agreed with Councillor Swan's remarks.

On the proposition of Mr. James Taylor, seconded by Mr. George Johnson, Mr. W. H. Hope and Mr. R. Baxter were unanimously re-elected secretaries of the respective parties, for which they both returned thanks.

The question of a fair wages clause in contracts for public authorities was considered, and the matter was left in the hands of the secretaries.

Mr. Geo. Johnson complained that, in spite of the promise of a certain firm to observe the local working rules, they were working until seven o'clock at nights, with the exception of Saturday, when they knocked off at one, and that they were unwilling to employ society men. After considerable discussion, it was resolved to make further inquiries, and, if it was found that the firm was not carrying out the rules of this district, to ask them to do so.

ROBERT HALL,
Building Surveyor,
52, Frederick Street, BURY.

With over 35 years practical experience of the Building Trade, and during the last 15 years a very varied experience in measuring up and adjusting contract and other accounts, is prepared to undertake and submit quotations for the following :—

The Measuring-up and Adjustment of Accounts,
Collection and Settlement of Accounts,
Assistance given in Estimating,
Annual or other Periodical Stocktakings,
Private Enquiries and Arbitrations undertaken,
or any other special work incidental to that of a Builder or Contractor.

52, Frederick St., BURY.

NATURAL ROCK ASPHALTE
(Compressed or Mastic)
For Horizontal and Vertical Damp Coursing
For Flat Roofs, Basements and other floors.
The French Asphalte Co., Ltd.
(ESTABLISHED 1871)
Supply only the best material from their own mine of St. Jean de Maruejols, combined with the best workmanship.
Complete satisfaction given to the leading Architects.
Apply for Prices :—
5, Laurence Pountney Hill, Cannon Street, E.C.

D. LORDEN,
Plasterer,
Plaster and Cement Merchant,
Worker in Fibrous Plaster, &c,
Tom Brown Street, RUGBY.

For Architects, Builders and Engineers.
TRUE TO SCALE.
BLACK LINE PRINTS.
Permanent. *Done on any Paper or Cloth.*
R's Method of Perspective.
WRITE FOR PARTICULARS.
W. F. STANLEY & CO., LTD.,
13, Railway Approach, London Bridge.
Tel. 871 Hop. Telegrams: "Tribrach, London."

T. N.: 14410 Central. T.A.: "Coatostone, London."
NEAL'S PATENT.
Coatostone
LIQUID STONE
Applied as Paint for Coating
Plaster, Cement, Stone or Woodwork
to produce a natural Stone effect
FOR INTERIOR OR EXTERIOR WORK
THE COATOSTONE DECORATION CO.,
77, Mortimer Street, Regent Street, W.

"The Practical Exemplar of Architecture."
A Portfolio of Choice Details ready for immediate use and adaptation.
Selected and Edited by
Mervyn E. Macartney, B.A., F.R.I.B.A., F.S.A.
120 Plates. Price 12/6 nett, including Portfolio.
Send for Illustrated Pamphlet.
Technical Journals, Ltd., Caxton House, Westminster.

A meeting of the Executive Council of the Sunderland and District Association was held in the Board Room on Thursday, June 17th, 1909, Mr. J. Morice Wright (vice-president) in the chair.

A complaint received from the operative bricklayers with respect to an alleged breach of the local working rules by a non-local federated builder was considered, and after hearing the contractor, the secretary was directed to see the secretary of the operatives and report.

The question of holding a picnic was discussed, and, on the proposition of Mr. J. McMillan, seconded by Mr. J. Emmerson, it was resolved to recommend that a visit be paid to the Dukeries, that the secretary obtain all the requisite information, that the date be either the 8th or the 15th of July, and that a circular be sent out to each of the members inviting them to take tickets.

The Federated Employers' Insurance Association, Ltd., Manchester, was adopted as the official company of this association.

It was mentioned that the Sunderland and South Shields Water Company was trying to enforce certain by-laws, as to which merely verbal instructions were being given, and it was resolved "That the secretary see the water company's engineer thereon, and also communicate with the Plumbers' Association to learn if they have any grievance in this direction."

The question of the alterations to the joiners' and bricklayers' working rules was discussed, and the secretary was directed to forward to the respective societies copies of the alterations, which appeared to be acceptable to all parties at the joint conference held on May 25th, 1909, asking them to give them their consideration, and notify the association of the decision arrived at.

Tyne and Blyth Federation.

A meeting of the Executive Council of the Tyne and Blyth District Building Trades Federation was held at the Hotel Metropole, Newcastle-upon-Tyne, on Thursday, June 17th, when there were present representatives from Newcastle-on-Tyne and South Shields, Blyth and North Shields being unrepresented. Mr. R. Heslop occupied the chair.

The question of workmen's compensation insurance was discussed, along with the recommendation passed by the Executive Council of the Northern Counties Federation of Building Trade Employers, recommending the Federated Employers' Insurance Association, Ltd., Manchester, and, on the proposition of Mr. R. Heslop, seconded by Mr. T. Anderson, it was unanimously resolved to adopt the company as the recognised insurers.

A circular letter issued by the different branches of the sub-trades appealing to architects for direct contracting for the subtraders was read. On the proposition of Mr. Foster, seconded by Mr. R. Heslop, it was resolved to take no action in the matter at present.

A resolution received from the Sunderland Incorporated Chamber of Commerce with reference to the non-payment of income-tax by corporate societies, and asking that they should be brought under assessment, was considered, and, on the proposition of Mr. J. T. Armstrong, seconded by Mr. T. Anderson, it was resolved: "That this Council approve of the proposal, and request the local associations to adopt it, and forward it to the Chancellor of the Exchequer."

The secretary reported that he had written to the local associations upon the proposals of the Chancellor of the Exchequer to increase the stamp duty upon the transfer of property from 10s. to 20s. per cent. The matter had been taken up strongly by the local associations, who had passed resolutions protesting against the tax, on the grounds that it would constitute an additional burden upon the sale of small properties, and discourage the building and acquisition of houses by small investors, and the resolutions had been forwarded to the Chancellor of the Exchequer, the Prime Minister, and the local members of Parliament. On the proposition of Mr. W. Foster, seconded by Mr. J. T. Armstrong, it was resolved: "That the action of the secretary be approved, and that the resolution be adopted."

The question of holding a picnic during the month of July was discussed, but the matter was dropped, as there was no strong desire to proceed.

The question of inviting the National Federation to hold their summer meeting in the Northern Counties area in 1911 was discussed, and the resolution thereon passed by the Executive Council of the Northern Counties Federation of Building Trade Employers read and adopted.

The present representatives upon the Conciliation Board, of which Mr. Weir (Newcastle), is chairman, were unanimously nominated for the ensuing year. — W. H. HOPE, solicitor, secretary, Post Office Chambers, 14, Norfolk Street, Sundreland.

Midland Centre.

NOTTINGHAM ASSOCIATION.

Secretary: W. J. Barton, F.C.I.S.

The Executive Committee of the Nottingham Association recently had a meeting with delegates of the Amalgamated Society of Carpenters and Joiners with reference to the technical instruction in joinery, which is being given by the Education Committee of the City. The joiners' delegates contended that this instruction should only be given to those who are engaged in the trade, as by giving it generally there was a waste of the ratepayers' money, and that giving this instruction to the general public was an injustice to their trade. The master builders generally agreed that the protest should be made, but thought it desirable to extend the scope of the protest by getting other trades to join, and that it should also be pointed out that great cost was being incurred for secondary education, which was in many cases being given to children of parents living outside the city, who escaped the cost of the heavy rates incurred in giving such education. The joiners' delegates agreeing with this view of the matter, it was unanimously resolved: "That this meeting of representatives of the Nottingham Master Builders' Association and the Amalgamated Society of Carpenters and Joiners invite the Nottingham and District Trades Council to join them in discussing the system of technical instruction as given by the educational authorities of the city, with a view to approaching them on the matter, as they are of the opinion that the present system is not conducive to the best interests of the trade concerned." This resolution was brought before the Nottingham and District Trades Council by the representative of the Amalgamated Society of Carpenters and Joiners, when the matter was referred to the Executive to deal with, and power given to call in others to assist them from the technical point of view.

The Council of the London Chamber of Commerce, at their meeting on June 10th, elected Mr. Henry Adams, M.Inst.C.E., F.S.I., etc. (Henry Adams and Son, 60, Queen Victoria Street, E.C.), a member of the Arbitration Committee of the Chamber, in addition to his membership of the Engineering Committee, which he has held for some years.

We regret to record the death of Mr. Thomas Barnsley, of Augustus Road, Edgbaston, at the age of seventy-seven. As a leading member of the firm of John Barnsley and Sons, builders, Mr. Barnsley executed some of the most important building work in Birmingham, including the Council House, the Art Gallery, the Union Club, and the General Hospital. Mr. Barnsley was appointed a city magistrate in 1896, and was a past-president of the Birmingham Master Builders' Association. He retired from business about ten years ago.

THE ASTON JUNCTION CO.
LTD.,
Aston Road, BIRMINGHAM,
BUILDERS' MERCHANTS
AND
SLATING CONTRACTORS.
CEMENTS, PLASTER, LATHS, LIME, QUARRIES, TILES, CHIMNEY POTS, SANITARY GOODS, FIRE BRICKS, and BLUE BRICKS of every description.
TELEGRAMS—"CONCRETE, BIRMINGHAM."
TELEPHONE NO.-1436, CENTRAL.

RUDDERS & PAYNES,
LIMITED.
TIMBER AND SLATE MERCHANTS,
SLATING, TILING AND FENCING CONTRACTORS.
SAWMILLS.
Every requisite for the Building Trade.
CHESTER ST. and HUBERT ST.,
ASTON RD., BIRMINGHAM.
Telegrams:—Sawmills, Birmingham.
Telephones:—2529, 807, & 4333 Central.

HOLLIS BROTHERS
& CO.,
Timber Importers.
HULL. Jameson Chambers.
LEICESTER. Queen Street.
Wood Block Flooring.
H. B. Hardwood,
Floorings,
Oak, Maple, etc.
Large Stocks of Joinery Wood held under cover.
Mouldings, etc., to design.
Telephone: No. 82 CENTRAL (2 Lines).
Telegrams: "ELF, BIRMINGHAM."

SUTTON & ASH,
41, SNOW HILL, BIRMINGHAM.
JOISTS, CHANNELS,
ANGLES, TEES,
RIVETTED GIRDERS,
LIGHT ROOFS, &c.

"The Architectural Review."
A Magazine of Architecture and Arts of Design. Edited by MERVYN E. MACARTNEY, B.A., F.R.I.B.A., F.S.A.
Price 1/- Monthly. Annual Subscription 16/- post free.
Technical Journals, Ltd., Caxton House, Westminster.

BUILDING TRADE LABOUR CONDITIONS, BRITISH AND FOREIGN.

Unemployment.

At a time when so much attention is being given to the question of unemployment in this country, and to the means whereby improved earnings may be secured to the working classes, a few notes of comparison between conditions at home and in foreign countries may prove of interest.

Admittedly we are passing through a period of bad trade which is especially pronounced in the building trade. The Board of Trade returns show that in 416 trade unions with a net membership of 700,867, the number of unemployed at the end of April last was 8.2 per cent. A year ago the percentage was 7.1.

The average maximum of unemployed between the years 1899 to 1908 was between 7 and 8 per cent. In the building trade the present rate of unemployment among carpenters and joiners is 11 per cent., and for plumbers 14 per cent.

Compare these figures with those of the State of New York, U.S.A. The trade union returns in that State for 1908 show that the number of unemployed varied in the summer months between 20 per cent. and 25.2 per cent., while in the winter months it rose to as high as 35.9 per cent. In other words a period of severe trade depression prevalent simultaneously in this country and in New York State caused in the latter an average amount of unemployment of from three to four times the average amount in this country.

In the State of Massachusetts the figures are a little more favourable, the number varying in the summer months between 8.99 and 16.4 per cent.—still much higher than has been the case here. The rate in the State of New York in 1906 was as low as 5.9 per cent., but generally the amount of unemployment there in recent years appears to have been about 12 per cent., which is much above the average rate in this country.

Wages in England, Germany and France.

From the Board of Trade statistics are taken the following average comparative figures for the three leading branches of the building trade.

ENGLAND.	
Bricklayers' average in eight cities, including London	41.0
Masons' average in eight large cities, including London	39.11
Carpenters' average in eight large cities, including London	39.8
	3)120.7
General average ...	40.2
GERMANY.	
Bricklayers' average in six large cities, including Berlin	32.6
Masons' average in seven large cities, including Berlin	31.0
Carpenters' average in six large cities, including Berlin	32.7
	3)96.1
General average ...	32.0
FRANCE.	
Bricklayers' average in eight large cities including Paris	24.1
Masons' average in eight large cities including Paris	27.8
Carpenters' average in eight large cities including Paris	29.1
	3)80.10
General average ...	26.11

The above comparison brings out in a remarkable manner the advantageous position occupied by operatives in the building trade in England as compared with those in France and Germany; and when the longer hours worked on the Continent are taken into account, and the admittedly higher cost of living there, together with inferior housing accommodation, higher rentals and consequent overcrowding, the comparison is vastly favourable to this country.

Trades Unions.

The "Report on Trade Unions in the United Kingdom in 1905-07," just issued by the Board of Trade, shows that in spite of trade depression the total membership at the end of 1907 was half-a-million more than at the end of 1904.

The unions connected with the building trades, however, show a decline of about 32,000.

Reverting to the total unions their accounts show a steady rise, the income of 1907 showing an increase of £400,000 over that of 1904, while the accumulated funds at the end of 1907 amounted to £5,600,000, an increase of nearly £1,000,000 since the end of 1904. During three years 1905-07 over £6,000,000 has been spent by the 100 principal unions. 8.2 per cent of this was for dispute pay, 23.2 per cent. for unemployed benefit and 46.1 per cent. on sick, accident, superannuation, funeral and similar benefits. Working and miscellaneous expenses accounted for the remaining 22.5 per cent.

The proportion spent in disputes was lower in these three years than the average for the period 1898 to 1907. The decrease in this expenditure was especially large in the case of the building trades in 1906-7 consequent on the increased use of methods of conciliation and arbitration in settling disputes.

It must be borne in mind that every saving effected by the unions in consequence of conciliation being substituted for strikes represents similar substantial savings to employers and the public, while it sets free a larger proportion of the union funds for those other beneficient purposes which figure so largely in their expenditure, and so lessens hardship and suffering in thousands of working class homes.

The following figures indicate this clearly. They apply to the building trade, being amounts paid under the heads given.

Year		Dispute benefit.		Unemployed benefit		Sick and accident benefit.
		£		£		£
1901	...	84,855	...	67,100	...	96,078
1905	...	57,479	...	142,987	...	111,808
1906	...	7,030	...	125,560	..	111,087
1907	...	6,594	...	115,951	...	108,733

The above figures are the more remarkable when it is taken into consideration that a decline in the numbers and membership of trades unions in the building trade has sychronised with the years of considerable depression through which the industry is and has been passing.

During the three years 1905-7, the Operative Bricklayers' Society lost 5,000 members, and the two principal unions of masons lost 10,000 members between them, while the Amalgamated Carpenters and Joiners shows a net decline of 2,000 in total membership, notwithstanding an exceptionally large increase (6,000) in the number of its members in branches outside the United Kingdom.

Trades Councils are local bodies. They have no power to direct the action of the unions represented, or to levy funds in aid of those on strike or for other purposes, but they frequently consider the cause or object of a trade dispute, and if satisfied, render financial and other assistance.

The number and membership of these Councils have steadily increased, and since 1898 the number shows a rise of nearly one-half and the membership of more than one-third.

The increase has been more marked in the South of England and in South Wales than in the other districts, the trades councils in this part of the Kingdom having doubled in membership and more than doubled in number. The increase is especially noticeable in the last five years, and seems to indicate that the workmen's organisation which has been hitherto somewhat slack and inactive in the south is changing in character and extent and will eventually exhibit similar signs of vigour to what it has long done in the northern parts.

The Acton Patent Concrete Partition Co. (1909), Ltd., contractors to H.M. Government, state that, owing to their offices on Cornhill being demolished for reconstruction, their address, as from June 24th, is 82, Victoria Street, and their telephone number Westminster 5474.

LONDON
JAMES BROWN (LONDON), LTD.,
MAKE THE BEST
HOLLOW POROUS BRICK PARTITIONS
In 1½ in., 2½ in., 3 in. and 4 in. thicknesses.
Takes a Nail Perfectly.
ESSEX WHARF, WHITECHAPEL, E.
— Telephone, 9513 Central. —

Telephone, No. 1062 HOLBORN.
Contractors to H.M. Government, &c.
THE PERFECT TILE CO.,
13 & 15, Featherstone Buildings,
Holborn, LONDON, W.C.
OPAL WALL TILES. GLAZED WALL TILES
Tessellated and other Floor Tiles.
Terrazzo and Cube Mosaics to any Design.
Fireproof Partitions. Fireproof Jointless Floors
AGENT FOR "MODERNIA" GLASS TILES

Send for Prices and Particulars of
FRAZZI FIREPROOF FLOORS & PARTITIONS.
Frazzi Fireproof Construction, Ltd.,
Essex Wharf, Durward Street,
WHITECHAPEL.

BIRKBECK BANK.
ESTABLISHED 1851.
SOUTHAMPTON BUILDINGS, HIGH HOLBORN, W.C.
2½ PER CENT. INTEREST.
allowed on Deposit Accounts.
2 PER CENT. INTEREST
on Drawing Accounts with Cheque Book.
All general Banking Business transacted.
ALMANACK with full particulars. POST FREE
C. F. RAVENSCROFT, Secretary.

"THE" LIFT & HOIST CO.,
Sole Makers of
"PREMIER" LIFTS, and
"Premier" Folding Partitions,
Premier Ironworks,
DEPTFORD, S.E.

Sprague Electric
ELEVATORS.
SPRAGUE ELEVATOR CO. LTD.,
QUEEN ANNE'S CHAMBERS,
WESTMINSTER,
LONDON, S.W.

"Practical Notes for Architectural Draughtsmen."
By ALFRED W. S. CROSS, M.A., F.R.I.B.A., and ALAN E. MUNBY, M.A., A.R.I.B.A.
Complete Set 12/-, including Portfolio; post free 12/6.
Send for descriptive Pamphlet.
Technical Journals, Ltd.,
CAXTON HOUSE,
WESTMINSTER, S.W.

THE NATIONAL FEDERATION OF BUILDING TRADE EMPLOYERS OF GREAT BRITAIN AND IRELAND.

COMPARATIVE STATEMENT showing the hours worked per week, and the rate of wages per hour in the various branches of the Building Trade in the undermentioned Federated Towns. [*All Rights Reserved.*]

EXPLANATORY.—The towns are grouped by Centres and Federations, each group in two sections—A, containing towns and cities of of over 100,000 inhabitants, and B those of 100,000 inhabitants and under. Information as to non-federated towns may be had from the undersigned on application.

A. G. WHITE, Secretary, 31 & 32 Bedford Street, Strand, London, W.C.

NOTES.—Where a sliding scale of hours is worked in winter the average of hours is given. The Mason's rate given is for Bankers; Fixers usually ½d. per hour extra. Abbreviations—l-dk, light to dark; a-m, As Men. B=Bankers; F=Fixers.

ENGLAND AND WALES.	MASONS.				BRICKLAYERS.				CARPENTERS and JOINERS.				PLASTERERS.				SLATERS.				PLUMBERS.				PAINTERS.				MASONS' LABOURERS.				BRICKLAYERS' LABOURERS.				PLASTERERS' LABOURERS.			
	SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.	
	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.
NORTHERN CENTRE.																																								
Northern Counties Federation.																																								
A. **Newcastle-on-Tyne**	44½	9½	41½	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44½	9½	53	9	47	9	50	8½	37	8½	a-m	6¼	a-m	6¼	50	6¼	44	6¼	50	6¼	44	6¼
Sunderland	B47 F50	9½	41½	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44	9½	50	9½	42	9½	53	‡38/6	53	38/6	50	8½	l-dk	8½	a-m	6¼	a-m	6¼	50	6¼	44	6¼	50	6¼	44	6¼
B. **Blyth**	44½	9½	41½	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44½	9½	53	9	47	9	50	8½	37	8½	a-m	6¼	a-m	6¼	50	6¼	44	6¼	50	6¼	44	6¼
Hartlepools	50	9½	41½	9½	53	9½	44½	9½	50	9¼	44½	9¼	53	9½	47	9½	50	9½	..	9½	53	9	53	9	53	8	..	8	50	6½	41½	6½	53	6½	44½	6½	53	7	47	7
Middlesbrough	49½	9	47	9	52	9½	47	9½	50	9¼	44	9¼	52	9½	52	9½	50	9½	44½	9½	53	9	53	9	52	8	40	8	49½	6¼	47	6¼	52	6¼	47	6¼	52	6¾	52	6¾
Shields (North)	44½	9½	41½	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44½	9½	53	9	47	9	50	8½	37	8½	a-m	6¼	a-m	6¼	50	6¼	44	6¼	50	6¼	44	6¼
Shields (South)	44½	9½	41½	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44	9½	50	9½	44½	9½	53	9	47	9	50	8½	37	8½	a-m	6¼	a-m	6¼	50	6¼	44	6¼	50	6¼	44	6¼
Stockton-on-Tees	50	9	47½	9	52	9½	47½	9½	50	9¼	44	9¼	53	9½	47	9½	52	9½	43	9½	53	9	53	9	53	8	44	8	50	6¼	47½	6¼	52	6¼	47½	6¼	53	6¾	47	6¾
Yorkshire Federation.																																								
A. **Bradford**	49½	9	l-dk	9	49½	9	l-dk	9	49½	8½	41½	8½	49½	8½	44	8½	49½	9	47	9	49½	9	46	9	52	8	48	8	49½	6	l-dk	6	49½	6	l-dk	6	49½	6½	44	6½
Halifax	49½	9	40	9	49½	9	40	9	49½	8¼	49½	8¼	51½	8½	48	8½	51½	8½	48	8½	49½	8	49½	8	50½	8	42	8	49½	6	40	6	49½	6	40	6	51½	6½	48	6½
Hull	53	9¼	45½	9¼	53	9	45½	9	53	9	45½	9	53	9	45½	9	53	9	45½	9	53	9	45½	9	53	8	45½	8	53	6½	45½	6½	53	6½	45½	6½	53	6½	45½	6½
Leeds	49½	9½	l-dk	9½	49½	9½	l-dk	9½	49½	9	42½	9	49½	9½	44	9½	50	9	45	9	49½	9	44	9	50	8	44	8	49½	6½	l-dk	6½	49½	6½	l-dk	6½	49½	7	44	7
Sheffield	49½	9½	44	9½	49½	9½	44	9½	49½	9	45½	9	49½	9	45	9	52	9	47	9	49½	9	47	9	55	7½	48	7½	49½	6	44	6	49½	6	44	6	49½	6	45	6
B. **Barnoldswick**	48½	8	42	8	48½	8	42	8	55	7½	46½	7½	49	8	38	8	49	8	38	8	54½	8½	46½	8½	55	6½	45	6½	48½	6	42	6	48½	6	42	6	49	6	38	6
Barnsley	49½	9	44	9	49½	9	44	9	49½	8½	44	8½	50	8	44½	8	50	8½	44½	8½	50	8½	50	8½	Var	8	Var	8	49½	6½	44	6½	49½	6½	44	6½	50	6½	44½	6½
Bridlington	55	8½	44	8½	55	8	44	8	55	7½	44	7½	55	8	44	8	55	10	44	10	55	9	44	9	55	7½	44	7½	55	6	44	6	55	5	44	5	55	5	44	5
Dewsbury	49½	8½	44	8½	49½	8½	44	8½	49½	8	44	8	49½	8½	44	8½	49½	7½	44	7½	49½	7½	44	7½	49½	7½	44	7½	49½	6	44	6	49½	6	44	6	49½	6	44	6
Grimsby	53	9	49½	9	53	9	49½	9	53	8	49½	8	53	9	47½	9	53	8½	47½	8½	53	8	41½	8	53	7½	41½	7½	53	6	49½	6	53	6	49½	6	53	7	47½	7
Harrogate	49½	9	45	9	49½	9	45	9	49½	8½	45	8½	49½	9	45	8	50	8½	44	8½	49½	9	43½	9	49½	7½	45	7½	49½	6	45	..	49½	6	45	6	49½	6	45	6
Huddersfield	49½	9	49½	9	49½	9	49½	9	49½	8½	49½	8½	49½	8½	49½	8½	49½	9	49½	9	50	7½–8	50	7½ 8	52½	8-8½	42	8–8½	49½	6	49½	6	49½	6	49½	6	49½	6	49½	6
Malton	52	8	48½	8	54½	7½	48½	7½	54	7	48	7	54½	7½	48	7½	54½	8	48	8	54½	7	48	7	54½	7	48	7	52	5½	48½	5½	54½	5	48½	5	54	5	48	5
Morley	49½	8½	44	8½	49½	8½	44	8½	49½	8	41½	8	49½	9	44	9	49½	9	44	9	..	..	..	..	..	..	..	..	49½	6	44	6	49½	6	44	6	49½	6	44	6
Scarborough	52	8½	44	8½	52	8½	44	8½	52	8	44	8	52	8	44	8	52	8	44	8	52	8	47	8	53	8	44	8	52	6	44	6	52	6	44	6	52	6	44	6
Selby	53	9	48	9	55½	9	48	9	55½	8	48	8	55½	9	48	9	55½	9	48	9	55½	7½	48	7½	55½	7	48	7	53½	6	48	6	55½	6	48	6	55½	6	48	6
Shipley	49½	8¾	l-dk	8¾	49½	8¾-9	l-dk	8¾-9	49½	8½	41½	8½	49½	8½	44	8½	49½	8½	42	8½	49½	9	47	9	52	7¾	40	7¾	49½	6	l-dk	6	49½	6	l-dk	6	49½	6	l-dk	6
Wakefield	49½	9	l-dk	9	49½	8½	l-dk	8½	49½	8	l-dk	8	50	8	l-dk	8	50	8½	l-dk	8½	50	7½	l-dk	7½	52½	7½	l-dk	7½	49½	6	l-dk	6	49½	6	l-dk	6	50	6	l-dk	6
York	50	9	41½	9	53	9	44½	9	53	8¼	44½	8¼	53	9	44½	9	53	9	44½	9	53	8	47	8	49½	7½	44	7½	50	6	41½	6	53	6	44½	6	53	6	44½	6
Lancashire, Cheshire, and North Wales Federation.																																								
A. **Birkenhead**	46½	10	42¾	10	49½	9½	42¾	9½	46½	10	46½	10	49½	9½	44	9½	49½	10	42¾	10	49½	9½	42½	9½	49½	8¾	39	8¾	46½	6½	42¾	6½	49½	6½	42¾	6½	49½	6½	44	6½
Bolton	48½	9½	44	9½	49½	10	47	10	49½	9½	47	9½	49½	10	41½	10	49½	9	41½	9	48½	9	46	9	51½	9	l-dk	9	..	..	..	..	..	..	..	..	..	..	..	..
Liverpool	47	10	43¼	10	47	10	43¼	10	47	10	47	10	49½	9½	45¼	9½	49½	9½	45¼	9½	49½	9¾	44	9¾	49½	8¾	44	8¾	47	5	43¼	5	49½	5½	44	5¾	49½	6	45¼	6
Manchester	46½	10	42¾	10	54½	10	42	10	49½	9½	42	9½	52	10	47	10	56	9	46¼	9	49½	9½	47	9½	52	9	41½	9	46½	5½	42¾	5½	54½	6	42	6	52	7	47	7
Oldham	48½	9½	44	9½	54½	10	47½	10	51	9½	46	9½	49	9	41½	9	54	8½	46½	8½	51½	9	45	9	54	8½	45	8½	48½	6	44	6	54½	6½	47½	6½	49	7	44½	7
Preston	49½	9½	42	9½	49½	10	44	10	49½	9½	40	9½	49½	9	41	9	49½	8½	42½	8½	49½	9	..	9	49½	8½	..	8½	..	..	..	..	..	..	..	..	..	..	..	..
B. **Altrincham**	49½	9½	41½	9½	54½	9½	42½	9½	49½	9½	44	9½	52	10	47	10	52	8½	44	8½	49½	9	46½	9	52	8½	44	8½	49½	6	41½	6	54½	6	42½	6	52	7	47	7
Ashton-under-Lyne	49½	9½	41½	9½	54½	10	41½	10	53½	9	46	9	53½	10	40	10	..	..	..	..	53½	9	46	9	54½	8½	44	8½	49½	5½	41½	5½	54½	5½	41½	5½	53½	6½	40	6½
Barrow-in-Furness	49½	9	44	9	54	9	44	9	54	8¾	46½	9	54	9	46½	9	54	9	46½	9	54	8½	49	9	54	8¼	44	8½	49½	6½	44	6½	54	6½	44	6½	54	6½	46½	6½
Blackpool	49½	9¾	44	9¾	49½	9½	44	9½	49½	8½	44	8½	49½	9½	44	9½	49½	8½	44	8½	49½	8½	47	8½	49½	8	l-dk	8	49½	6	44	6	49½	6	44	6	49½	6	44	6
Burnley	49½	9	44	9	49½	9½	44	9½	51	8½	46½	8½	54	8½	49	8½	54	8	49	8	54	8	49	8	..	..	..	..	49½	6	44	6	49½	6	44	6	54	6	49	6
Bury	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

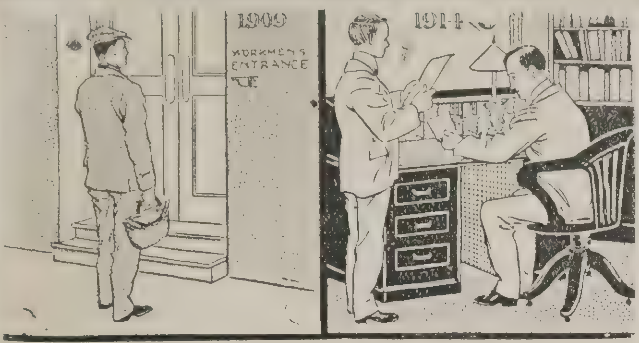
‡ Per Week.

ENGLAND AND WALES (*continued*).	MASONS.				BRICKLAYERS.				CARPENTERS and JOINERS.				PLASTERERS.				SLATERS.				PLUMBERS.				PAINTERS.				MASONS' LABOURERS.				BRICKLAYERS' LABOURERS.				PLASTERERS' LABOURERS.			
	SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.		SUMMER.		WINTER.	
	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.
Chester	49½	9	44	9	54½	9	47	9	54½	8½	47	8½	54½	9	47	9	54½	9	47	9	54½	8½-8¾	47	8½8¾	54½	7½	44	7½	49½	5½	44	5½	54½	5¾	47	5¾	54½	5-5¾	47	5-5¾
Crewe	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Darwen	49	9½	44	9½	49	9½	44	9½	49	9½	44	9½	49	9	44	9	..	..	..	..	49	9	44	9	49	8½	44	8½	49	..	44	..	49	..	44	..	49	..	44	..
Heywood	48½	9½	1-dk	9½	53½	10	1-dk	10	53½	9	46	9	53½	9	1-dk	9	53½	8	1-dk	8	..	..	..	..	56½	8½	1-dk	8½	53½	6½	1-dk	6½	53½	6½	1-dk	6½	53½	6½	1-dk	6½
Hyde. *See* Ashton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Lancaster	49½	9½	41½	9½	49½	10	41½	10	49½	8½	49½	8½	49½	9	44	9	49½	9	44	9	53	8	47	8	49½	8½	49½	8½	49½	5½	41½	5½	49½	5½	41½	5½	49½	6	44	6
Leigh	53½	9½	1-dk	9½	53½	9½	1-dk	9½	48½	9½	44¾	9½	53½	9	48½	9	53½	8½	1-dk	8½	54	9	47	9	54	8	48½	8	53½	6	1-dk	6	53½	6½	1-dk	6½	53½	6½	48½	6½
Llandudno	55	8½	1-dk	8½	55	8	1-dk	8	55	7¾	51½	7¾	55	8	51½	8	55	8	51½	8	55	8	47½	8	55	7½	1-dk	7½	55	5	1-dk	5	55	5	1-dk	5	55	5	51½	5
Longridge	49½	9½	1-dk	9½	..	..	..	..	49½	7½	1-dk	7½	49½	8	1-dk	8	49½	8	1-dk	8	49½	8½	1-dk	8½	49½	8½	1-dk	8½	49½	6	1-dk	6	..	..	..	..	49½	5½	1-dk	5½
Macclesfield	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Middleton	48½	9½	41½	9½	53½	10	43	10	54	9	41½	9	48½	9	41½	9	53½	8½	1-dk	8½	54	9	47	9	54	8½	47	8½	48½	5½	41½	5½	53½	6½	43	6½	48½	6½	41½	6½
Radcliffe	48½	9½	41	9½	54½	10	41½	10	49	9½	43	9½	54	9	41½	9	54	8½	1-dk	8½	49	9	45	9	51½	8½	1-dk	8½	48½	6	43	6	54½	6½	41½	6½	54	6½	41½	6½
Rochdale	48½	9½	40	9½	53½	10	42	10	48½	9	38½	9	48½	9	41½	9	48½	8¼	1-dk	8¼	49	9	46½	9	54	8½	1-dk	8½	48½	6	40	6	53½	6	42	6	48½	6	41½	6
Rossendale	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Southport	49½	9	..	9	49½	9	..	9	49½	9	..	9	..	..	.	..	..	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
St. Anne's-on-Sea	49½	9½	47	9½	49½	9½	47	9½	49½	8½	47	8½	49½	9½	47	9½	49½	8½	47	8½	49½	8½	47	8½	49½	8	47	8	49½	6½	47	6½	49½	6½	47	6½	49½	6½	47	6½
St. Helens	46½	9	Var	9	53½	9	45	9	50	9¼	46½	9¼	46½	9	Var	9	54	9	46½	9	54	8½	50	8½	54	8¼	50	8¼	46½	5½	Var	5½	53½	6	Var	6	46½	6	Var	6
Stalybridge. *See* Ashton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stockport	49	9½	41	9½	54½	9½	47	9½	54½	9	47	9	54½	10	47	10	54½	9	47	9	54	9	47	9	..	..	..	..	49	6	41	6	54½	6	47	6	54½	7	47	7
Wallasey	47	10	43	10	49½	9¾	46½	9¾	47	10	47	10	49½	9½	46½	9½	49½	9½	46½	9½	49½	9½	42½	9½	49½	8¾	42½	8¾	47	7	43	7	49½	7	46½	7	49½	7	46½	7
Warrington	..	8¾	..	8¾	54½	9¼	45	9¼	54½	9¼	45	9¼	54½	9½	45	9½	..	8½	..	8½	..	9¼	..	9¼	..	8	..	8	..	5 to 6	..	5-6	54½	5 to 6	45	5-6	54½	5 to 6	45	5-6
Wigan	49½	9½	41½	9½	54½	10	45	10	49½	9	44	9	54½	9	46½	9	55½	9	48	9	54½	9	47	9	54½	8½	39	8½	49½	5½-6	41½	5½-6	54½	6½-7	45	6½-7	54½	6¼	46½	6¼
MIDLAND CENTRE.																																								
A. Birmingham	51	10	45	10	51	9½	45	9½	51	9½	45	9½	51	10	45	10	..	..	..	..	..	..	..	..	..	..	..	..	51	6½	45	6½	51	6½	45	6½	51	6½	45	6½
Derby	53	9	44	9	56	9	47½	9	56	8½	47½	8½	56	9	47½	9	56	9	47½	9	56	8½	47½	8½	56	7½	47½	7½	53	5½	44	5½	56	5½	47½	5½	56	6	47½	6
Leicester	53	9½	47	9½	53	9	47	9	53	9	47	9	53	10	47	10	..	..	..	..	53	9	47	9	..	..	..	..	53	6½	47	6½	53	6½	47	6½	53	..	47	..
Nottingham	51½	9½	41½	9½	51½	9	41½	9	51½	9	41½	9	51½	10	41½	10	51½	9	41½	9	54	9	47	9	51	8½	41	8½	51½	6½	41½	6½	51½	6½	41½	6½	51½	6½	41½	6½
B. Bromsgrove	56½	8	51	8	56½	7½	51	7½	56½	7	51	7	56½	7½	51	7½	56½	7½	51	7½	56½	8	51	8	56½	6	51	6	56½	4	51	4	56½	4	51	4	56½	4	51	4
Burton-on-Trent	54	8½	47	8½	54	8½	47	8½	54	8½	47	8½	54	8½	47	8½	54	8½	47	8½	54	8	47	8	54	7¼	47	7¼	54	6	47	6	54	5¾	47	5¾	54	..	47	..
Coventry	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dudley	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
King's Norton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Leamington	56½	8½	43	8½	56½	8	43	8	56½	8	43	8	56½	8½	43	8½	56½	8	43	8	56½	8	43	8	56½	7	43	7	56½	5	43	5	56½	5	43	5	56½	5	43	5
Long Eaton	54	9	44	9	54	9	44	9	54	8½	44	8½	54	9	44	9	54	9	44	9	54	8½	44	8½	54	7	44	7	54	6½	44	6½	54	6	44	6	54	6	44	6
Malvern. *See* Worcester	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mansfield	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Northampton	55½	8½	47	8½	55½	8½	47	8½	55½	8½	47	8½	55½	8½	47	8½	55½	8½	47	8½	55½	8½	47	8½	55½	8½	47	8½	55½	5½	47	5½	55½	5½	47	5½	55½	5½	47	5½
Newark	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
North Staffordshire	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Nuneaton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Redditch	56½	7½	48	7½	56½	7½	48	7½	56½	7½	48	7½	56½	7½	48	7½	56½	7½	48	7½	56½	7	48	7	56½	7	48	7	56½	5	48	5	56½	4½	48	4½	56½	5	48	5
Stafford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stourbridge	56½	8½	45	8½	56½	8	45	8	56½	8	45	8	56½	8½	45	8½	..	..	..	..	56½	8	45	8	56½	7	45	7	56½	5½	45	5½	56½	4½	45	4½	56½	5	45	5
Walsall	55½	9	50½	9	55½	8½	49	8½	55½	8½	49	8½	55½	8½	49	8½	55½	8½	49	8½	55½	8½	49	8½	55½	7¼	49	7¼	55½	6½	49	6½	55½	5¾	49	5¾	55½	6	49	6
West Bromwich	54	9½	48	9½	54	9	51	9	54	8½	51	8½	54	9	51	9	..	..	..	..	56½	8	42½	8	56½	7	42½	7	54	6½	48	6½	54	6	51	6	54	6	51	6
Wolverhampton	53	9	37	9	53	9	37	9	53	9	37	9	..	..	..	..	53	8	37	8	53	9	37	9	54	7½	42½	7½	53	6	37	6	53	6	37	6	..	..	..	..
Worcester (and Malvern)	54	*8½	42½	8½	54	8½	42½	8½	54	8½	42½	8½	54	8½	42½	8½	54	8½	42½	8½	54	8½	42½	8½	54	8½	42½	8½	54	5½	42½	5½	54	5½	42½	5½	54	5½	42½	5½

* Fixers ¾d. extra.

ENGLAND AND WALES.	MASONS.				BRICKLAYERS.				CARPENTERS and JOINERS.				PLASTERERS.				SLATERS.				PLUMBERS.				PAINTERS.				MASONS' LABOURERS.				BRICKLAYERS' LABOURERS.				PLASTERERS' LABOURERS.			
	Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.		Summer.		Winter.	
	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Wages per Hour.	Hours per Week.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.	Hours per Week.	Wages per Hour.
SOUTH-EASTERN CENTRE.																																								
Eastern Counties Federation.																																								
A. **Norwich**	56	8	48	8	56	8	48	8	56	8	48	8	56	8	48	8	56	8	48	8	56	8	48	8	56	6½	48	6½	56	5	48	5	56	5	48	5	56	5	48	5
B. **Cambridge**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Yarmouth	56½	7 7½	47	7-7½	56½	7½	47	7½	56½	7½	47	7½	..	..	..	..	..	..	..	..	56½	7½	47	7½	56½	6	47	6	56½	4½	47	4½	56½	4½	47	4½	..	..	..	..
London Federation.																																								
A. **London**	50	10½	44	10½	50	10½	44	10½	50	10½	44	10½	50	11	44	11	..	..	..	..	50	11	44	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Southern Counties Federation.																																								
A. **Brighton**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Portsmouth	55½	8½	45	8½	55½	8½	45	8½	55½	8	45	8	55½	8½	45	8½	..	..	..	..	..	7½	..	7½	55½	6½	45	6½	55½	6	45	6	55½	6	45	6	55½	6	45	6
Southampton	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
B. **Chatham**	55½	8	49	8	55½	9	49	9	55½	8½	49	8½	55½	9	49	9	55½	9	49	9	55½	8½	49	8½	55½	7	49	7	55½	5½	49	5½	55½	5½	49	5½	55½	5½	49	5½
Maidstone	55½	8½	45½	8½	55½	8½	45½	8½	55½	8½	45½	8½	..	..	..	..	..	..	..	..	55½	8½	45½	8½	55½	7½	45½	7½	55½	5½	45½	5½	55½	5½	45½	5½	55½	5½	45½	5½
SOUTH-WESTERN CENTRE.																																								
South-Western Federation.																																								
A. **Bristol**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
B. **Bath**	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Bridgwater	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Cheltenham	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Exeter	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Gloucester	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hereford	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Stroud	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Wales Federation.																																								
A. **Cardiff**	54	9	45-8	9	54	9	45-8	9	54	9	45-8	9	54	9	45-8	9	54	9	45-8	9	54	9	45-8	9	54	8	45-8	8	54	5½-6½	45-8	5½6½	54	5½-6½	45-8	5½6½	54	5½-6½	45-8	5½6½
B **Newport (Mon.)**	56½	8½	47½	8½	56½	8½	47½	8½	56½	8½	47½	8½	56½	8½	47½	8½	56½	8½	47½	8½	56½	8½	47½	8½	56½	8	47½	8	56½	5½	47½	5½	56½	5½	47½	5½	56½	5½	47½	5½
Swansea	54	8½	48	8½	54	8½	48	8½	53	8½	47	8½	54	8½	48	8½	54	8½	48	8½	54	8½	48	9	54	8	48	8	54	5½-6	48	5½-6	54	5½-6	48	5½-6	54	5½-6	48	5½-6
Pontypridd	54	8½	50½	8½	54	8½	50½	8½	54	8	50½	8	54	9	50½	9	54	9	50½	9	54	8	50	8	60	7½	40½	7½	54	6	50½	6	54	6	50½	6	54	6	50½	6
IRELAND.																																								
A. **Dublin**	54	8½	SS½	8½	54	8½	SS½	8½	54	8	SS½	8	54	8	SS½	8	54	8	SS½	8	54	8	SS½	8	54	8½	SS½	8½	54	7½	SS	7½	54	4½	SS	4½	54	4	SS	4
Belfast	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
SCOTLAND.																																								
Scottish Federation.																																								
A. **Aberdeen**	51	8	45	8	..	..	..	..	51	8	45	8	51	8	40	8	51	8	40	8	48	8½	45	8½	51	8	40	8	51	5	45	A5	..	..	..	..	51	A4¾	40	A4¾
Alloa	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dingwall	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dumfries	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dundee	50	8½	45	8½	55	10	44½	10	50	9	44	9	50	9	44	9	50	8½	44	8½	50	9	44	9	50	8½	44	8½	50	5½	45	5½	55	5½-6	44½	5½-6	50	5½	44	5½
Edinburgh	51	8½	45	8½	51	9½	45	9½	51	9	45	9	51	..	45	..	51	..	45	..	51	9	45	9	..	..	..	..	51	5-5½	45	5-5½	51	5½	45	5½	51	6	45	6
Glasgow	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hawick	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Inverness	51	8	45	8	..	..	..	..	51	7½	45	7½	51	7	45	7	51	7½	45	7½	..	7½	..	7½	51	7½	45	7½	51	5	45	5	..	..	..	..	51	5	45	5
Keith	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Kilmarnock	51	8½	47	8½	51	9	47	9	51	9	45	9	51	9	45	9	56	8	47	8	51	8½	51	8½	51	9½	47	9½	51	5	47	5	51	5½	47	5½	51	5½	45	5½
Oban	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Paisley	51	9	40	9	51	9½	40	9½	51	9	45	9	51	9½	40	9½	51	9	40	9	51	9½	45	9½	51	9	45	9	51	6	40	6	51	6	40	6	51	6½	40	6½
Perth	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

SS½=Sliding Scale with ½d. per hour increase. SS=Sliding Scale. A=About.



What YOU can accomplish in five years or a shorter time.

Isn't it an attractive possibility—to be able to leave poorly-paid, hum-drum, "do-as-you-are-told" employment for a high salaried, congenial position which gives scope for your personality? Thousands of workers in all parts of the world have realised this possibility through the International Correspondence Schools. YOU can realise it by the same means. The I.C.S. exist for the specific purpose of furnishing the training which qualifies for good positions, on terms within the reach of all, by means of home correspondence study. You can depend absolutely on the "salary-raising" efficiency of I.C.S. training. There is a solid 17 years record of good work behind the I.C.S. To-day the Schools have more students than any other educational institution in the world. Every month, students voluntarily report advancement as a direct result of I.C.S. training. One student writes:—

> "Paris, France.
>
> When I enrolled in your Electric Traction Course, I was engaged in a track construction gang, at a salary of £4 a month. After I enrolled I was successfully made boss of the track gang, and finally was appointed Traffic Manager of the same Company at a salary of £28 a month Your system of instruction by correspondence is most efficient and must be considered invaluable by everyone who wishes to perfect himself for technical work without interfering with his daily occupation.
>
> (Signed) A. B. SCHELL."

Remember, "What man has done man can do." In five years from now, or a much shorter time, YOU can occupy a high and responsible position in your chosen line, if you will only equip yourself with the necessary training NOW. Isn't it well worth your while to devote some of your leisure to interesting study when the reward is so great? Let us send you full particulars, not only of our courses, but also of our

"STUDENTS' AID DEPARTMENT"

which is in close touch with employers in every district, and devotes its entire attention to assisting our students in the matter of employment by introductions, recommendations, etc.

Mark the coupon, or write us about any special career—and thus

Take the first step towards success to-day.

103

Registrar, INTERNATIONAL CORRESPONDENCE SCHOOLS, Ltd.,
(Dept. B.), International Buildings, Kingsway, London, W.C.

I am interested in your system of Technical Training and desire to increase my earning power. Please send me, post paid, free of charge, the Book covering the subject before which I have marked **X** on the coupon, and full information showing how I can succeed in same.

Architecture.
Mechanical Engineering.
Electrical Engineering.
Structural Engineering.
Gas Engineering.
Machine Shop Practice.
Sanitary Engineering.
Textiles.
Civil Engineering.
Analytical Chemistry.
Mining Engineering.
Steam Engineering.

Name .... *Age* ....
Street ....
Town .... *Occupation* .... 30/6. 09.

Residents of the following countries should address the respective I.C.S. branches:— CANADA: Toronto. INDIA: Fort, Bombay. SOUTH AFRICA: Cape Town. NEW ZEALAND: Wellington. AUSTRALIA: Sydney ITALY: Naples. CHINA Shanghai. P.I. Manila. HONOLULU: Honolulu. PANAMA: Ancon. BERMUDA Hamilton. STRAITS SETTLEMENTS: Singapore. PORTO RICO: San Juan JAMAICA: Kingston. MEXICO: Mexico, D.F. ARGENTINE REPUBLIC: Buenos Aires.

The Renowned

Andrews-Hawksley

Patent Tread

Applied to Wood, Iron, Stone or Concrete Stairways, Floors, Landings, Platforms, Non-Conducting Floor Plates for Electric Light and Power Stations, Pavement Covers, etc., etc.

Pioneers of all Stair Treads.
The Tread that has lasted a lifetime.
There is nothing to equal it in the Market.

Architects and Engineers are invited to inspect our New Iron Staircase and Stair Tread made and laid by us at St. James's Park Station (District Railway).

Quotations given for Concrete Steps fitted complete with our Treads.

HAWKSLEY REVERSIBLE WOOD BLOCK TREAD
REGISTERED TRADE MARK.

Quotations given for Concrete Steps fitted complete with our Treads.

¶Used by Great Western Railway, London and North Western Railway, London Brighton and South Coast Railway, Great Northern Railway, Midland Railway, North Eastern Railway, North British Railway, Lancashire and Yorkshire Railway, H.M. Office of Works, War Office, Admiralty, etc.

Specialists in Light Constructional Work in Iron or Steel; Special Work in Wrought or Cast Iron; Staircases of every description; Concrete and Granolithic Work, etc.

Fire Escape Staircases with our Treads, a Speciality.

THE ANDREWS-HAWKSLEY PATENT TREAD & ENGINEERING COMPANY,

Columbia Works, Prestons Road,
POPLAR, LONDON, E.

Telephone No. 700 Eastern.
Telegrams: "Uniflorous, London."

Publishers' Notices.

Offices: Advertisement, Editorial and Counting House—Caxton House, Westminster. Publishing—6, Great New Street, Fetter Lane, E.C.
Telegraphic Address: "Buildable, London."
Telephones: Advertisement, Editorial and Counting House—817 Gerrard. Publishing—2200 Holborn (six lines).

Date of Publication:—The Builders' Journal and Architectural Engineer is published every Wednesday, price 2d.

The Subscription Rates per annum are as follows:—

	s.	d.
At all newsagents and bookstalls - -	8	8
By post in the United Kingdom - -	10	10
By post to Canada - - - - - - - -	13	0
By post elsewhere abroad - - - - - -	17	4

The Index (with Title Page) for each half-yearly volume is supplied free on application to the Publisher.

Subscribers can have their volumes bound complete with Index, in cloth cases, at a cost of 3/6 each.

Advertisements for the current week, alterations to serial advertisements, etc., must reach the office not later than first post on Saturday.

Rates for Serial Advertisements, Special position etc., sent upon application

Situations Wanted-

4 lines (about 28 words), one insertion -	1s. 6d.
Each additional line - - - -	6d.
Three insertions* - - - -	3s. 0d.

* This includes 6 weeks under Employment Register

Situations Vacant. Miscellaneous, Drawings and Tracings, Educational, Competitions Open Partnerships, etc., per 6d. line.

The above must be prepaid.

Property and Land Sales, Legal Notices, etc., 9d. per line

Advertisements for the above can be received up till 5 o'clock on Monday Evening at

CAXTON HOUSE, WESTMINSTER, S.W.

Issued by the same Publishers—

Price 1s. Monthly—

THE ARCHITECTURAL REVIEW,

Edited by Mervyn E. Macartney, B.A., F.S.A., F.R.I.B.A.

This high-class Review is finely illustrated, and includes among its regular features "The Practical Exemplar in Architecture," with Views and Measured Drawings

Tenders.

Addressed postcards, on which lists of tenders may be stated, will be sent free on application to the Manager, Builders' Journal, *Caxton House, Westminster.*

Information from accredited sources should be sent to "The Editor," at latest by noon on Monday if intended for publication in the following Wednesday's issue. Results of Tenders cannot be accepted unless they contain the name of the Architect or Surveyor for the work.

Belper.—Accepted for erection of Girls' Cottage Home on the Holbrook Road, for the Guardians:—
J. W. Haynes, Belper, £1,152 8s. 6d.

Briton Ferry (Wales). — For erection at Briton Ferry of 51 houses for the working classes, for the Briton Ferry Urban District Council. Mr. H. Alex. Clarke, architect and surveyor, Council Offices, Briton Ferry.

W. Davies, Briton Ferry	£12,020
Jones and Thomas, Boylan	11,785
W. P. and E. Williams, Port Talbot	11,285
Davies and Co., Tonyrefail	11,239
L. Gower, Briton Ferry	10,510
W. H. Evans, Cardiff	10,340
T. Waters,* Briton Ferry	9,555

*Accepted.

Architect's estimate, £9,745.

Cobridge (Staffs.).—For additions to manufactory, for Messrs. H. and R. Johnson. Messrs. R. Scrivener and Sons, architects, etc., Hanley.

A. E. Chatfield	£1,286
T. Godwin	1,159
W. Grant and Sons	1,115
J. Cooke	1,100
C. Cornes and Son	1,095
J. Grant	1,078
Colley and Lindop	1,058
Bennett Bros.	1,000
H. Wardle,* Davenport Street, Longport	990
C. Smith	980

*Accepted.

Coventry.—For erection of new workship, Dale Street, for the Triumph Cycle Company, Ltd.:—

W. Moss and Co.	£2,206	0	0
T. Bailey and Co.	1,995	0	0
E. Harris	1,927	0	0
J. Worwood	1,923	0	0
Late C. Garlick's Executors ...	1,870	0	0
T. Hickman	1,860	16	8
A. J. Lord	1,830	0	0
T. Higgs	1,827	0	0
Jones and Bacon	1,802	15	0
F. Smith	1,798	0	0
Orr Bros.	1,794	5	2
Kelley and Son	1,792	6	6
H. Goode,* Coventry	1,750	0	0
Beardsmore and West	1,717	0	0
R. P. Gathersole	1,662	0	0

*Accepted.

Devonport.—For alterations to the "Golden Lion," P.H., Fore Street, Devonport, for Messrs. Allsopp, Ltd. Quantities by Messrs. Leest and Adams, Devonport. Mr. E. M. Leest, M.S.A., architect, 14, St. Aubyn Street, Devonport.

Jenkin and Son	£650	0	0
Pile and Son	638	10	0
Smith and Son	619	15	0
Solomon and Down, Plymouth	510	0	0
Pearce Bros.*	474	0	0

*Accepted.

Rest of Devonport.

East Kirby.—For new slaughterhouses, East Kirby. Walter H. Woods, M.S.I., architect, High Street, Long Eaton, near Nottingham. Quantities by the architect.

Tate and Son, Annesley ...	£1,389	19	4
Hoole, East Kirby	1,365	0	0
Stubbings and Fell, Sutton ...	1,360	0	0
Coleman and Blackburn, Kirby	1,350	10	0
Messom, Nottingham	1,320	0	0
Evans Bros., Alfreton	1,305	0	0
Bains,* East Kirby	1,295	0	0
Wainer, Nottingham	1,255	0	0
Perks and Son, Long Eaton	1,240	0	0

*Accepted.

Ebbw Vale (Mon.).—Accepted for erection of new schools at Tallis Town, Ebbw Vale, for the Ebbw Vale Education Committee. Mr. H. Waters, Ebbw Vale, architect. Quantities by the architect.
A. J. Colborne, Swindon, £14,200. Architect's estimate, £13,950.

Gosport.—For erection of a Baptist church in Stoke Road, Gosport. Messrs. John Wills and Sons, architects, Victoria Chambers, Derby.

F. J. Privett...	£2,567	0	0
G. J. Davis	2,547	0	0
H. Jones and Sons...	2,479	0	0
C. J. Lear and Sons	2,397	0	0
W. W. Evans	2,381	0	0
W. R. Light and Sons ...	2,375	0	0
J. Croad	2,294	0	0
C. M. Dash	2,255	0	0
J. Hunt,* South Wharf, Gosport	2,215	10	0

*Accepted.

Architect's estimate, £2,230.

(*Tenders continued on page viii.*)

"SCAFFIXER" Block.

REVOLUTIONISES SCAFFOLD FIXING.

Supersedes the Scaffold Cord and Wedge. Practically Indestructible. Never slackens nor slips.

Immense Saving in Time and Labour.

D. P. JONES' Patent Rapid

Patent Utility Scaffolding Bracket.

SCAFFOLDING BLOCK

And Utility Bracket.

Used as Ledger and Standard Tie.

FIXED IN ONE MINUTE. RELEASED INSTANTLY.
Write for particulars and photographs to THE
Patent Rapid Scaffold Tie Co.,
Limited,
124, Victoria St., Westminster, S.W.
Contractors for the Supply, Hire, or Erection of Scaffolding.
Tel. 6030 Wstmnstr. Teleg. "Scaffixer, London."

Used as Single or Band Ties.

Telegrams—"Hoptonwood, Wirksworth." Telephone—No. 9 Wirksworth.

THE HOPTON-WOOD STONE FIRMS, Ltd.

QUARRY OWNERS and WORKERS of WHITE, GREY and DARK HOPTON-WOOD STONE, BIRD'S EYE, BLACK and FOSSIL MARBLES.

Wirksworth, DERBYSHIRE.

London Agency Office: 134, CHEAPSIDE.
Telegrams—"Guttridge, London." Telephone—2759 Central.

THE BUILDERS' JOURNAL BOOK LIST.

Being a comprehensive Catalogue of the most recent and authoritative text-books on various subjects connected with Architecture and the allied Arts of Design, Building Construction, and Engineering, together with their published prices, 1908.

Price 3d. Post Free, 3½d.

Technical Journals, Ltd.,
Caxton House, Westminster, London.

JAMES CHEW & Co.,
Brookhouse Brass and Copper Works,
BLACKBURN.

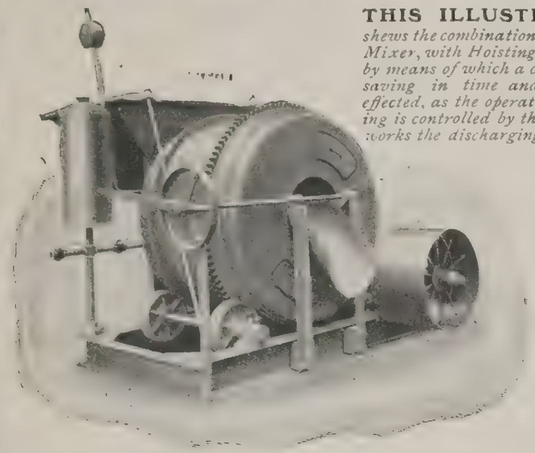
Copper Cylinders and Boilers and Pans of every description.
Sanitary Brass work.
Copper Cylinders for any pressure.
Copper Boilers for every class of Range.

Galvanised Cisterns.
Roofs and Turrets covered with Copper.

RANSOME

CONCRETE MIXER.

(Manufactured by Ransomes and Rapier, Ltd.)



THIS ILLUSTRATION *shews the combination of Concrete Mixer, with Hoisting Apparatus by means of which a considerable saving in time and labour is effected, as the operation of hoisting is controlled by the man who works the discharging chute.*

NO TILTING TO DISCHARGE THE CONCRETE.

SIMPLE. RAPID. EFFICIENT.

Write to-day for our FREE

ILLUSTRATED HANDBOOK,

Containing important information which should be in the hands of all Contractors and Builders, regarding the Ransome Concrete Mixer,

RANSOME-VERMEHR MACHINERY CO.

507, Caxton House, Westminster, S.W.

STACEY'S

PATENT

WINCHES.

TIME AND LABOUR SAVED.

Builders, Contractors, Fireproof Building Constructors, etc., can effect a saving of 50 per cent. in labour by the use of these Winches.

In use and used on

Royal Mail Offices,
Kingston, Jamaica.

New Mills,
Elland, Yorkshire.

New Works,
Entent, Singapore.

Salvation Army
Shelter,
Blackfriars Road,
London, S.E.

Prospect Works,
Sheaf Street, Leeds.

New Schools,
Raynes Park,
Surrey.

New Schools,
Llandudno.

Western Valley
Sewers,
Newport, Mon.

And numerous other buildings in London and the Provinces.

WITH BRAKE. WORKED BY ONE MAN.

Can be worked in any position. A large number in use. Always in Stock.

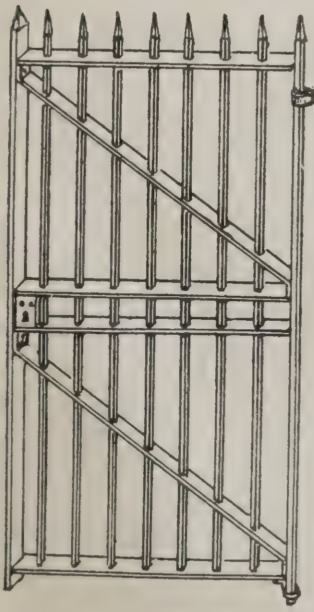
Send for Illustrated Circular.

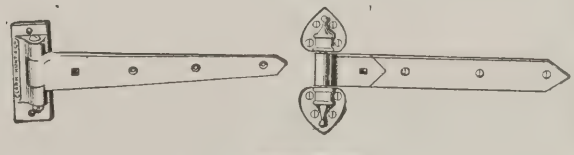
G. STACEY & CO.,

66, Lorrimore Rd., WALWORTH, LONDON, S.E.

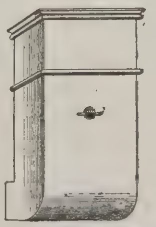
IRONWORK FOR COUNCIL SCHOOLS

GENERAL BUILDERS' IRONWORK.

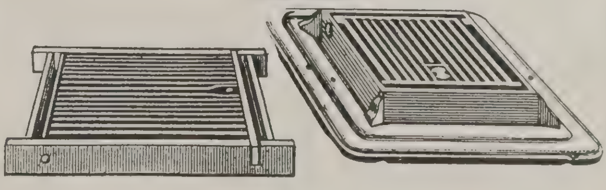


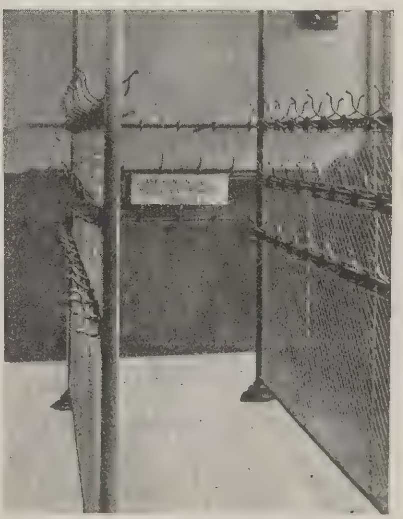


GATES . .
and . . .
RAILINGS.



TOBIN TUBES
and
GULLY
GRATES





PATENT HAT AND COAT RAILS.

CLARK, HUNT & CO., Ltd., *Middlesex Ironworks,* **Shoreditch, London.**

GENERAL CATALOGUE ON APPLICATION.

(Tenders continued from page vi.)

Grimsby.—For erection of villa residence in Weelsby Road, for Mr. E. Sharman. Mr. G. H. Munby, architect, Grimsby.

Pumfrey	£940
Gill	897
Vicars	885
J. H. Thompson and Son, Ltd.	862
Johnson	860
Hewins and Goodhand	847
H. W. Parker and Son,* Boston and Grimsby	810

*Accepted

Grimsby.—For erection of villa residence in Weelsby Road, for Mr. H. Bacon. Mr. G. H. Munby, architect, Grimsby.

Pumfrey	£1,030	0	0
Gill	975	0	0
Vicars	925	0	0
J. H. Thompson and Son, Ltd.	901	0	0
Johnson	895	0	0
Hewins and Goodhand	886	17	6
H. W. Parker and Son,* Boston and Grimsby	880	0	0

*Accepted.

Huddersfield.—For erection of a mill at Bay Hall, for Messrs. Stork and Green. Messrs. Stocks and Sykes, architects, St. Peter's Street, Huddersfield.

Law, Stead, and Sons, Fartown (masons)	£1,245	0	0
S. Ratcliffe, Birkby (joiner)	473	10	6
J. Marsden and Sons, Market Place (plumbers)	192	10	0
Pickles Bros., Fountain Street, (slaters)	188	10	0
W. E. Jowitt, Fitzwilliam Street (plasterer)	73	10	0
G. Moxon and Sons, Market Street (painters)	114	7	7
H. Brooke and Co., Colne Road (ironfounders)	292	0	0
J. Cooke, Folly Hall (concreter and fireproof-flooring, etc.)	1,073	8	3

All of Huddersfield.

London.—For erection of a manual training centre for 40 boys on the Park Walk site, Chelsea, for the London County Council Education Committee.

Lapthorne and Co., Lambeth	£1 265	0	0
A Roberts and Co., Ltd., Earl's Court Road	1,264	0	0
J. and W. Drake, Willesden Green	1,238	7	6
T. Bendon, Ltd., Hammersmith	1,219	3	3
J. Peattie, Portman Square	1,162	0	0
Lole and Co., Chelsea	1,159	11	10
Lathey Bros., Battersea Park	1,157	0	0
E Triggs, Clapham	1,063	0	0
S. N. Soole and Son,* Sheen Road, Richmond	1,052	14	10

Architect's (Education) estimate, £1,136.
*Recommended for acceptance.

London.—For new school, Torriano Avenue, St. Pancras, N.W., for the London County Council Education Committee.

Spencer, Santo and Co., Ltd., Kensington High Street	£14,758	0	0
Leslie and Co., Ltd., Kensington Square	14,056	0	0
Patman and Fotheringham, Ltd. Islington	13,671	0	0
W. Johnson and Co., Ltd., Wandsworth Common	13,465	0	0
J. Smith and Sons, Ltd., South Norwood	13,442	0	0
McLaughlin and Harvey, Ltd., 13, Brecknock Road	13,192	4	7
McCormick and Sons, Northampton Street, Essex Road	13,063	0	0
L. H. and R. Roberts, Islington	13,020	0	0
G. Godson and Sons, Kilburn Lane	12,987	0	0
Treasure and Son, Ltd., Upper Holloway	12,951	0	0
C. F. Kearley, 4, Great Marlborough Street	12,893	0	0
J. Chessum and Sons, 7a, South Place*	12,648	5	3
E. Lawrance and Sons, Wharf Road, City Road	12,530	0	0

Architect's (Education) estimate, £13,154.
*Recommended for acceptance.

Portsmouth.—For erection of a nurses' home aa the Royal Portsmouth, Portsea, and Gosport Hospital. Mr. C. W. Bevis, F.R.I.B.A., architect, Elmgrove Chambers, Southsea.

H. Jones and Son	£7,890
G. J. Davis	7,765
Coltherup and Woods, Portsea	7,750
W. R. Light and Son, Landport	7,587
J. Croad, Portsea	7,300
Wakeham Bros., Plymouth	7,275
J. Crockerell	7,231
E. and H. Springings, Stamshaw	7,225
S. Salter,* Yorke Street	6,997

Rest of Southsea.
*Accepted.

Sittingbourne (Kent).—For erection of a new Council School, to accommodate 400 children, for Kent Education Committee. Mr. W. H. Robinson, Caxton House, Westminster, S.W., architect.

W. Sanderson	£5,787	2	9
S. Edwards	5,582	0	0
Morse and Co.	5,195	0	0
H. M. Patrick	5,001	0	0
T. Higgs	4,995	0	0
Browley and Co.	4,940	0	0
H. Dixon	4,882	0	0
Godden and Son	4,818	0	0
Hayward and Paramore	4,771	0	0
Thomas and Edge	4,762	0	0
West Bros.	4,755	0	0
G. W. Gates and Sons	4,750	0	0
Spencer, Santo and Co.	4,738	0	0
G. E. Wallis and Sons	4,720	0	0
A. S. Ingleton	4,697	0	0
C. E. Skinner	4,687	0	0
E. Fuller and Sons	4,675	0	0
Amos and Foad	4,669	0	0
H. J. Tidy	4,649	0	0
G. H. Deene and Son	4,640	0	0
T. Monk	4,601	10	0
Pethick Bros., Ltd.	4,588	0	0
S. Wise	4,577	0	0
G. Barker and Son	4,499	0	0
Jones and Andrews	4,475	0	0
W. J. Ballard and Co.	4,464	0	0
E. Bishop and Sons	4,371	0	0
J. A. Davison	4,371	0	0
L. Seager	4,336	0	0
W. and L. Bowes,* Milton Regis Kent	4,312	19	0

*Recommended for acceptance.

Solihull. — For erection of Aged and Chronic Wards, etc., for the Guardians of the Solihull Union. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

W. J. Bloxham, Banbury	£7,281
C. A. Horton, Staffordshire	7,277
R. Dorse, Cradley Heath	6,995
John Barnsley and Sons, Birmingham	6,989
E. Garfield, Ltd., Aston Manor	6,984
W. and J. Webb, Birmingham	6,981
George Robinson, Birmingham	6,970
Richard Fenwick, Ltd., Birmingham	6,950
Thos. Rowbotham, Birmingham	6,940
I. Whitehouse and Sons, Birmingham	6,921
J. W. Smith and Co., Birmingham	6,910
George Webb and Son, Birmingham	6,900
Sapcote and Sons, Birmingham	6,855
Chas. J. Grove and Sons, Warwickshire	6,797
Francis H. Smith, Birmingham	6,735
W. Harvey Gibbs, Birmingham	6,573
W. Pattinson and Sons, Ltd., London, S.W.	6,469
Bragg Bros., Solihull	6,448
T. and W. Thompson, Solihull	6,300
John Dallow and Sons,* Black Heath	6,240

*Accepted.

Sherborne (Dorset).—For additions to the Sherborne Ladies' College. Messrs. John Harding and Son, architects, 58, High Street, Salisbury.

Wort and Way, Salisbury	£6,042	0	0
Parnell and Son, Rugby	5,875	14	0
Harris Bros., Salisbury	5,605	0	0
Guppy and Son, Sherborne	5,190	0	0
H. Gillingham,* Sherborne	5,167	0	0

J. G. HAMMOND & CO., LTD.
PRINTING CONTRACTORS.

LONDON WORKS: 32 to 36, Fleet Lane, Ludgate Circus, E.C.
MIDLAND WORKS: Scotland Passage, High Street, and Moor Street, Birmingham.

SPECIALITY:

CATALOGUES of all kinds,
PUBLICATIONS of all kinds,
BOOKS of all kinds.

LARGE INSTALLATION OF LINOTYPE AND MONOTYPE COMPOSING MACHINERY. ENGLISH, AMERICAN AND FAST ROTARY PRINTING AND FOLDING MACHINERY.

☞ IMITATION TYPEWRITTEN CIRCULARS supplied with names and addresses typed in separately to match the body or alternatively so printed as to enable you to type in the names and addresses on your own typewriter.

SEND FOR ESTIMATES AND UNIQUE TESTIMONIALS.

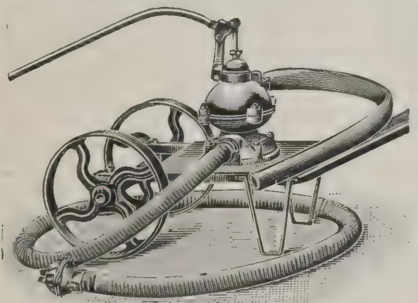
ROOFING SLATES.
Velinheli, Penrhyn and Westmoreland.
SLATE SLAB GOODS
Both Plain and Enamelled.
ALFRED CARTER & CO., LIVERPOOL.

THATCHING AND REED LAYING.
J. G. COWELL, SOHAM.

LAUNDRY
and Cooking Engineers.
ILLUSTRATED CATALOGUE A.C. FREE.
W. SUMMERSCALES & SONS, Ltd.
Laundry Engineers, KEIGHLEY.

THE STRAND
DRAWING OFFICE
PERSPECTIVES
WORKING DRAWINGS.
DRAWINGS FROM SKETCH PLANS.
DESIGNS TO A CUBED COST.
ASSISTANCE IN COMPETITIONS.
MODELS.
TRACINGS.

R. CHARLES HALL,
Gladstone House,
188, Strand,
LONDON, W.C.
Telephone: No. 5553 Central (P.O.).



BRITISH BUILT DIAPHRAGM Trench Pumps, Sewage and other Pumps, &c.
PATENT WOOD-WORKING MACHINERY.
F. BASTIN & CO., ENGINEERS, 37, QUEEN VICTORIA ST, E.C.
T. A. "BASTIN, LONDON." T. N. 6236, CENTRAL, P.O.

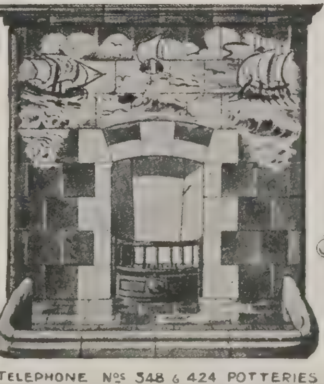
"AQUABAR"
WATERPROOFING COMPOUND
For Cement and Concrete.
Easiest to use, most economical, reliable and satisfactory.
C. S. TAPLIN & Co.,
MOORGATE STATION CHAMBERS,
LONDON, E.C.

A small advertisement in "The Builders' Journal" saves
Time, Money and Worry.
For Rates see page vi.

THE WOULDHAM CEMENT Co. Ld.
RED CROSS BRAND.

RED CROSS BRAND
is the highest quality of
PORTLAND CEMENT.
quick medium or slow setting.
Established 1855.
Output, Lion Works, Grays. 3,000 tons weekly.
35, GREAT St. HELENS, E.C.
Telephone No. 1846 Avenue *Telegrams Enriching, London*

BOOTE'S FAIENCE FIREPLACES & TILES OF EVERY DESCRIPTION



TELEPHONE Nos 348 & 424 POTTERIES
NAT. TEL. CO.

THESE FIREPLACES CAN BE SUPPLIED IN ANY OF OUR RICH ENAMEL COLOURS TO SUIT ANY ROOM & ANY SIZED FIRE
PLAIN GLAZED WALL TILES
ENAMELS & MAJOLICA TILES
FLOOR TILES · CERAMIC MOSAIC
ARCHITECTURAL FAIENCE

Est. 1842
T. & R. BOOTE Ltd.
THE PATENT TILE WORKS
BURSLEM · STAFFS ·
TELEGRAMS · BOOTE BURSLEM
LONDON OFFICE BIRKBECK CHAMBERS HOLBORN · W.C.
MANCHESTER OFFICE 49 DEANSGATE
HOLBORN 3426 NAT. TEL. CO.

COMPLETE LIST OF CONTRACTS OPEN.

In this list are included, as a rule, only those contracts for which tenders are returnable about five days after the date of this issue.
Unless expressly stated to the contrary, all deposits required for bills of quantities, etc., are returned on receipt of *bona-fide* tenders.
The words "Fair Wages Clause" inserted in certain paragraphs signify that persons tendering must conform to a fair wages clause in the ontract, which requires them to pay the rates of wages current in the district.

BUILDING.

July 3. **MEXBOROUGH.**—Asphalting, building retaining wall, and improvements to urinals, at Mexborough Garden Street and Doncaster Road provided schools, for the West Riding C.C. Specifications of W. R. Hudson, Education Office, Mexborough, to whom tenders are to be sent.

July 3. **TREDEGAR.**—Erection of thirty or more workmen's cottages, for the Glyn Building Club. Plans and specifications may be seen at the offices of A. F. Webb, Architect and Surveyor, High Street, Blackwood, or Tredegar, to whom tenders are to be sent.

July 3. **GUILDFORD.**—Erection of a receiving home for children, for the Guardians of the Union. Plans, specifications, etc., on deposit of £3 3s. with Edward L. Lunn, Architect, 36, High Street, Guildford. Tenders must be delivered to W. S. V. Cullerne, Clerk to the Guardians, Union Offices, Commercial Road, Guildford.

July 3. **KING'S NORTON (near BIRMINGHAM).**—Erection of new Council Schools as follows, for the U.D.C. (a) Cotteridge infants' school for 400 children; architect, J. P. Osborne, 95, Colmore Row, Birmingham. (b) Stirchley Street infants' school for 400 children; architect, W. A. Harvey, 5, Bennett's Hill, Birmingham. Names, with deposit of £1 1s. for each school, to John F. Moore, Secretary, Education Offices, King's Norton.

July 5. **BELFAST.**—Plastering and renovating Doagh Masonic Hall. Plan, etc., may be obtained from W. C. Heron, Doagh.

July 5. **ABERDARE.**—Erection of 10 houses for the Monk Street Building Club. Plans, etc., of Thomas Roderick, Clifton Street, Aberdare. Tenders are to be sent to E. J. Hughes, Solicitor, Canon Street, Aberdare.

July 5. **LOFTUS.**—Erection of stone boundary wall, also levelling ground and forming footpaths for the U.D.C. Plans and specifications of R. Dyson Nutt, Clerk to the Burial Board, 38, Market Place, Loftus, to whom tenders are to be sent.

July 5. **FALMOUTH.**—Erection of a pair of semi-detached villas, near Gyllyngvase Beach, Falmouth. Plans, specifications, etc., of H. E. Tresidder, P.A.S.I., A.I.S.E., architect, 23, Church Street, Falmouth, to whom tenders are to be sent.

July 5. **LLANTWIT MAJOR.**—Erection of two semi-detached houses in Turkey Road, Llantwit Major. Plans, etc., can be seen at Tonypandy office of W. M. Lewis and L. N. Morgan, Architects; or at Pontypridd office; or 12, Edward Terrace, Cardiff, by appointment.

July 5. **ABERDARE.**—Erection of a men's hall, institute, and free library, at Cwmbach, Aberdare, Plans, etc., of Thomas Roderick, architect, Ashbrook House, Clifton Street, Aberdare. Tenders to be sent to A. T. Atkins, Cwmbach National Schools, Aberdare.

July 5. **BALLYHERRIDAN, near ARMAGH.**—Erection of a new dwelling-house, at Ballyherridan, for William Menary. Drawings and specification, with full particulars, can be obtained from Sampson Jervois, M.R.I.A.I., Architect, Armagh, to whom tenders are to be sent.

July 5. **ALNMOUTH.**—Execution of (1) laying part of a new floor and repairing plaster work; (2) asphalting paths to play ground; and (3) internally painting and color-washing premises, for the managers of the Council School. Specifications and other particulars may be obtained from the school-house.

July 5. **PENDLETON.**—Alteration and addition to buildings at the electricity works, for the Corporations of Salford. Plans, etc., of Victor A. H. M'Cowen, M.I.E.E., Borough Electrical Engineer, Frederick Road, Pendleton, on deposit of £1 1s. Tenders to the Chairman of the Electricity Committee.

July 6. **LUTON.**—Erection of a new public library for the Corporation. Plans and specification by S. F. L. Fox, A.M.I.C.E., Borough Engineer and Surveyor, Town Hall, Luton, of whom plans, etc., may be obtained on deposit of £3 3s. with the Borough Accountant. Tenders to be sent to Bruce Penny, Town Clerk, Town Hall, Luton.

July 6. **PLYMOUTH.**—Painters', Carpenters', and masons' work, at certain of the scattered homes, for the Guardians of the Poor of Plymouth. Specification of W. Adams, Clerk to the Guardians, 13, Princess Square, Plymouth, to whom tenders are to be sent.

July 6. **BRIGHTON.**—Erection of a residence at the Workhouse, Elm Grove, for the Assistant Medical Officer, for the Guardians of the Poor. Specification, etc., of Hawker and Clover, Architects for the Guardians, 9, North Street, Brighton, Tenders to be sent to B. Burfield, Clerk to the Guardians, Parochial Offices, Prince's Street, Brighton.

July 7. **TREHAFOD.**—Erection of six houses at Trehafod. Plans and specification of Edward Rees, Architect and Surveyor, Alexandra Chambers, Pontypridd, to whom tenders are to be sent.

July 7. **CHARLTON HORETHORNE.**—Alterations and additions to the Charlton Horethorne School. Plans and specifications at Benson's offices, Yeovil. Tenders to be sent to A. J. Stacey, Charlton Horethorne.

July 7. **KNOTTINGLEY.**—Erection of a new school at Knottingley, for the West Riding Education Committee. Plans, etc., of the Architects, Tennant and Collins, of Pontefract. Deposit of £1 must be paid to the West Riding Treasurer. Tenders to be sent to C. Harris, Divisional Clerk.

July 7. **YSTRAD MYNACH, WALES.**—Erection of a vestry, with conveniences and boundary walls at Ystrad Mynach, for the Welsh Methodist Connexion. Drawings and specification of T. Edmund Rees, Architect and Surveyor, Merthyr Tydfil. Tenders to be sent to John Lewis, Preswylfa, Hengoed, near Cardiff.

July 7. **LONDON, S.W.**—Repairs to slate roofs and chimney-stacks, etc., at the South-Western Fever Hospital, Landor Road, Stockwell, S.W., for the Metropolitan Asylums Board. Conditions of contract, etc., prepared by W. T. Hatch, M.I.C.E., M.I.MechE., Engineer-in-Chief, at the office of the Board, Embankment, E.C., on deposit of £1. Tenders must be delivered at the office of the Board.

July 7. **BURGHILL (near Hereford).**—Construction of additions to the Council School at Burghill, near Hereford, for the C.C. Plans may be seen at the County Surveyor's Office, where bills of quantities and form of tender may be obtained on deposit of £2 2s. Tenders should be sent to John Wiltshire, County Education Secretary, Education Office, Shirehall, Hereford.

July 7. **TIVERTON.**—Erection and completion of new school buildings, for the Governors of the Middle Schools and School of Art. Plans, etc., prepared by W. H. Ashford, A.R.I.B.A., Architect, 90, New Street, Birmingham. Bills of quantities and form of tender on application to E. S. Perkin, director, School of Art, Fore Street, Tiverton, accompanied by deposit of £2 2s.

July 7. **FAIRMILEHEAD.**—Erection of a sluice-keeper's cottage at Fairmilehead, for the Edinburgh and District Waterworks. Plans and specification, etc., of the Engineer, W. A. Tait, C.E., 72a, George Street, Edinburgh, on deposit of £1. Tenders to be sent to William Boyd, W.S., Clerk to the Trust, Edinburgh and District Water Trust Offices, St. Giles Street, Edinburgh.

July 7. **DAGENHAM.**—Enlargements and alterations to Dagenham Elementary Schools, for Ford's Charitable Bequest. Plans and specification prepared by the Architect, Joseph Aylott, 25, Ludgate Hill, E.C., to whom names and addresses, with a deposit of £2 2s. should be sent. Plans and specification may be seen with D. T. Williams, Clerk to the Governors, 71, South Street, Romford.

July 7. **SWANSEA.**—Erection and completion of the following works for the Swansea Union Workhouse, for the Guardians: — (1) operating block, together with bridge connecting same to male block, etc.; (2) extension to female imbecile block. Plans and specifications, and bills of quantities and all particulars of the Architect, Charles T. Ruthen, Bank Chambers, Swansea, on deposit of £2 2s. Tenders to be sent to Llewn. Jenkins, Clerk, Union Offices, Alexandra Road, Swansea.

July 7. **INVERKEITHING.**—Excavator, brick and mason, iron and smith, carpenter and joiner, glazier, plumber, plaster, slater, harling and asphalt works of tenements of shops and dwelling-houses to be erected in Hope Street, Inverkeithing, for the Rosyth Building and Estates Company, Limited. Plans may be seen and schedules of quantities obtained, on deposit of £1 1s., with the architect, William Williamson, F.R.I.B.A., Kirkcaldy, or with A. C. Philp, C.A., Secretary, 143, High Street, Dunfermline, to whom tenders are to be sent.

July 8. **DURHAM.**—Alterations and additions to Sherburn Hospital, Durham. Plans and particulars of Joseph Potts and Sons, architects and surveyors, 57, John Street, Sunderland, to whom tenders are to be sent. Quantities on deposit of £1 1s.

July 8. **PEAKDALE, near BUXTON.**—Erection of infants' school and additions to Peakdale Council School, near Buxton, for the Derbyshire C.C. Names to George E. Garlick, Architect, Quadrant Chambers, Buxton. Bills of quantities and forms of tender of the Architect upon deposit of £1 1s. Tenders must be delivered to the Architect. Two sureties required.

July 8. **FEATHERSTONE.**—Execution of builder, joiner, slater, plasterer, plumber and painter works, at the Featherstone New School, for the West Riding Education Committee. Plans and specifications with quantities on application to the West Riding Architect, County Hall, Wakefield. Deposit of £1 in each case must be sent by separate letter to the West Riding Treasurer, County Hall, Wakefield. Tenders to be sent to Francis Alvey Darwin, Clerk to the Council, County Hall, Wakefield.

July 9. **SKELMANTHORPE.**—Alterations to Skelmanthorpe Provided Mixed School. Specifications to be had of William Wood, Divisional Clerk, Penistone, to whom tenders are to be sent.

July 9. **GLOUCESTERSHIRE.**—Carrying out works of repair, painting, etc., at schools, for the Gloucestershire Education Committee. Particulars of work may be obtained from R. S. Phillips, Architect and Surveyor's Department, Midland Bank Chambers, Gloucester.

July 9. **DURSLEY.**—Erection of new premises at Dursley, for the Committee of the Cainscross and Ebley Co-operative Cociety, Ltd. Names to the architect, R. Worcester, Co-operative Wholesale Society, Ltd., 1, Balloon Street, Manchester, together with cheque for £1 1s.

July 9. **PONTYCYMMER.**—Erection of 36 cottages, for the Gwynfryn Building Club. Plans and specifications at the Ffaldau Collieries Co.'s Offices, Pontycymmer, on deposit of £1 1s. Tenders addressed to C. Scoble, Ffaldau Collieries Co. (Limited), Exchange Buildings, Cardiff.

July 10. **MONEYMORE (CO. DERRY).**—Improvements to Moneymore Catholic Church, for the Rev. Eugene M'Aleavey, P.P. Plans, etc., may be seen at the Presbytery, Moneymore, or at offices of J. V. Brennan, C.E., Architect, Belfast Bank Chambers, Belfast.

July 10. **MERTHYR TYDFIL.**—Erection of two pairs of semi-detached villas at The Walk, Merthyr Tydfil, for Messrs. James and others. Plans and specifications of T. Edmund Rees, Architect and Surveyor, Merthyr Tydfil, to whom tenders are to be sent.

July 10. **BURY.**—Erection of a secondary school at Westminster Street, Bury, for the Corporation. Plans prepared by J. T. Halliday, A.R.I.B.A., of 14, John Dalton Street, Manchester, at whose offices drawings may be inspected, and also specifications and bills of quantities, upon deposit of £2. Tenders to be delivered to the Town Clerk, Bury.

July 10. **LAUDER.**—Mason, joiner, plumber, plasterer, slater, asphalte work, painter work, heating, and electric lighting, etc., of Lauder Technical School extension. Offers to be lodged with D. Gorrie, Clerk to the School Board, 104, High Street, Dunfermline, in whose hands are the plans and from whom schedules of quantities may be obtained.

July 10. **KESWICK.**—Erection of four blocks of cottages at Keswick. Separate tenders required for each block. Plans, bill of quantities, and specifications may be seen at the office of D. N. Pape, Estate Agent, Keswick, and at the office of the Architect, A. N. W. Hodgson, 9, High Street, Windermere. Tenders must be sent to J. H. Davies, Sec., Derwentwater Tenants, Ltd., Braithwaite, Keswick.

July 10. **WHALEY BRIDGE.**—Erection of proposed joint Council schools at Whaley Bridge, for the Derbyshire Education Committee. Drawings, etc., at the office of the Architect to the Committee, St. Mary's Gate, Derby, where bill of quantities, specification, conditions of contract, and form of tender can be obtained, on deposit of £1 1s. Tenders must be delivered to George H. Widdows, A.R.I.B.A., Architect to the Committee, County Education Office, St. Mary's Gate, Derby.

July 12. **GUILDFORD.**—Additions, alterations, paintwork and repairs to the Elementary Schools, for the Corporation. Plans and specification, etc., of the Borough Surveyor, C. G. Mason, Assoc., M.Inst.C.S., Tun's Gate. Tenders to be sent to F. S. Tosswill, Secretary to the Education Committee, Onslow Bridge Chambers, Guildford.

July 12. **ASHLEY (HANTS.).**—Erection of an additional classroom for fifty children, and a cloakroom, at Ashley Council school, for the County Council. Plans and other information of W. J. Taylor, County Surveyor, The Castle, Winchester. Plans, specification, and conditions of contract, also at the school at Ashley. Tenders to be sent to H. Barber, Clerk, The Castle, Winchester.

July 12. **SOUTHAMPTON.**—Erection of an additional classroom for fifty children, and a cloakroom, at Ashley Council School, for the C.C. Plans, specification, and conditions of contract (no quantities), and other information, at the office of W. J. Taylor, County Surveyor, The Castle, Winchester. Tenders to be sent to H. Barber, Clerk to the County Council, The Castle, Winchester.

July 12. **LEICESTER.**—Erection of public baths in Knighton Fields Road West, for the Corporation. Bills of quantities at the office of the architect, Arthur H. Hind, A.R.I.B.A., 3, Grey Friars, Leicester, upon deposit of £1 1s. Tenders to be addressed, "The Chairman, Baths Committee, Town Hall, Leicester," and to be delivered to H. A. Pritchard, Town Clerk, Town Hall.

July 12. **BICESTER (OXON).**—Construction of new cattle market, as follows:—1, buildings, roads, drainage, and concreting; 2, constructional ironwork for cattle, sheep, and pig pens; for the U.D.C. Plans and specifications of the Council's Surveyor, Richard Parker, Market Hill, Bicester. Bills of quantities and form of tender, on deposit of £3 3s. Tenders to be sent to Edwd. Foster Tanner, Clerk to the Council, Bicester.

July 12. **GUILDFORD.**—Construction of superstructural buildings (upon foundations already completed) over the refuse destructor, plant and machinery, at Bellfields, Stoke, for the Corporation. Plans, etc., of C. G. Mason, A.M.I.C.E., Borough Enginer and Surveyor, Tuns Gate, Guildford, on deposit of £2 2s. Tenders to be sent to F. S. Miller, Town Clerk, Town Clerk's Office, Bridge Street, Guildford.

July 12. **SWINDON.** — Internal and external renovations to Cricklade, Old Swindon, and New Swindon Police Stations, for the Wilts. County Council. Specifications and forms of tender can be obtained on application to the County Surveyor, Trowbridge. Tenders, addressed to the County Surveyor, to be sent to J. George Powell, County Architect and Surveyor, County Surveyor's Office, County Offices, Trowbridge.

July 12. **MANCHESTER.**—Erection of the Moseley Road Municipal School, Fallowfield, Manchester, for the Education Committee. Plans and bills of quantities (including specification) at the Education Offices, Deansgate, Manchester, on deposit of £2 2s. Tenders to be sent to William Henry Talbot, Town Clerk. Cheques to be made payable to the Accountant, Education Offices, Deansgate, Manchester.

July 12. **TOTTENHAM.**—Execution of summer repairs to various schools in the district, for the Education Committee. Separate tenders are invited for repairs to playgrounds. Specifications, particulars, and forms of tender may be obtained upon application to W. H. Prescott, A.M.I.C.A., Surveyor to the Committee, Council Offices, Tottenham, on deposit of £1 1s. Tenders must be delivered to W. Mallinson, Clerk, Education Offices, Philip Lane, Tottenham. Fair wages clause.

July 13. **READING.**—Alterations and additions to the Workhouse (Infirm Women's block), for the Guardians. Plans and specifications, and forms of tender, of the Master of the Workhouse, 344, Oxford Road, Reading. Tenders to be sent to W. H. Oliver, Clerk to the Gardians, 32, Thorn Street, Reading.

July 14. **LONGFORD.**—Repairs, etc., to Surgeon's house, for the Governors of the Longford Infirmary. Particulars and specification can be had from S. Wilson, Medical Hall, Longford, Registrar, to whom tenders are to be sent.

July 14. **GRANTHAM.**—Erection of a girls' secondary school for the Kesteren County Council Education Committee. Quantities, etc., may be obtained from H. N. Dunn, A.R.I.B.A., Silver Street, Lincoln, on deposit of £1 1s. Tenders are to be sent to Hudson Donaldson, Secretary, County Education Office, 64, London Road, Grantham.

July 15. **PEKING, CHINA.**—Erection and completion of a group of buildings to be used as a bureau of engraving and printing, for the Chinese Government. Plans, etc., prepared by the architects, Milburn, Heister, and Co., Home Life Building, Washington, D.C. Plans, etc., at the Chinese Consulate, 88, Fenchurch Street, London. Bids from America and Europe must be filed with the Chinese Legation at Washington, D.C

July 15. **HONINGHAM.**—Alterations and additions to the East Tuddenham and Honingham School. Applications should be sent to Lacey and Upcher, Architects and Surveyors, 6, Upper King Street, Norwich, where plans and specifications can be seen, and copies of quantities obtained. Tenders to be delivered to the Rev. G. O. Crawshaw, Honingham Vicarage, Norwich, where particulars may also be obtained.

July 15. **ST. ALBANS, HERTS.**—Alterations and additions to accommodate 582 additional patients at the Asylum, for the Visiting Committee. A selection will be made from names of the firms received, and the selected firms will then be invited to tender. Further particulars will be given by Rowland Plumbe, F.R.I.B.A., 13, Fitzroy Square, London, W., or by the Clerk to the Committee. Names to be sent to Walter Geo. Austin, Clerk of the Visiting Committee, Guildhall, Westminster, S.W.

July 16. **KING'S NORTON (near BIRMINGHAM).**—Erection of a Council Secondary School, for the Worcestershire County Council. Applications for forms of tender, etc., must be made by June 30 to the Education Office, and must be accompanied by £2 2s. deposit. Drawings of the Architects, Pritchard and Pritchard, Bank Buildings, Kidderminster. Tenders must be delivered to A. Weston Priestley, Director of Education, County Education Office, 37, Foregate Street, Worcester.

July 19. **EXETER.**—Removing the old and building a new bridge over the River Mew, for the Devon C.C. Plans, etc., of H. Michelmore, Clerk to the Council, Castle of Exeter, to whom tenders are to be sent.

July 19. **BIRKENHEAD.**—Construction of a dwarf brick wall, with counterforts and stone coping, for the Corporation. Plan, specification and particulars, of Chas. Brownridge, M.I.C.E., borough engineer and surveyor, on deposit of 10s. Tenders to be sent to James Fearnley, Town Clerk, Town Hall, Birkenhead. Fair wages clause.

July 19. **WINCHESTER.**—Extension of Winchester Post office, for the Commissioners of H.M. Works and Public Buildings. Drawings, specifications, etc., of the Postmaster of Winchester. Bills of quantities and forms of tender, on deposit of £1 1s. with the Secretary, H.M. Office of Works, etc., Storey's Gate, London, S.W., to whom tenders are to be sent.

July 19. **HANDSWORTH (STAFFS).**—Erection of a chapel and entrance lodge at the cemetery at the Leveretts, Handsworth, for the U.D.C. Applications for bills of quantities and conditions of contract must be made, with cheque for £3 3s., to Ernest Ward, Clerk, The Council House, Handsworth, Staffordshire. Drawings, specifications, and conditions of contract with the Architect, W. H. Bidlake, M.A., 37, Waterloo Street, Birmingham.

July 20. **DURHAM.**—Erection of a new Higher Elementary School and Pupil Teachers' Centre, at Tanfield Lea, new Council School at Bloemfontein; alterations at Willington and Collierley Council schools, for the C.C. Plans, specifications, and general conditions, and bills of quantities as follows:—1, for Tanfield Lea and Bloemfontein Schools, at the office of W. Rushworth, Shire Hall, Durham; 2, for alterations at Willington and Collierley schools, at the office of F. E. Coates, Shire Hall, Durham. Tenders to be sent to W. J. Dawson, Clerk to the Education Committee, Shire Hall, Durham.

No Date. **CHAPEL-EN-LE-FRITH.**—Erection of proposed new Primitive Methodist schools at Chapel-en-le-Frith. Plans and bills of quantities of Bryden and Walton, Architects and Surveyors, Buxton.

No Date. **LEEDS.**—Alterations, etc., to the Miners' Institute, York Road, Leeds, for the Yorkshire Miners' Association. Names to be sent to Garside and Pennington, architects, Pontefract and Castleford.

No Date. **GREENOCK.**—Alterations at Alan Ker School, for the Burgh School Board. Schedules of quantities and form of tender of A. F. Niven, Clerk of Board, Burgh School Board Offices, Municipal Buildings, Greenock, on deposit of 10s.

No Date. **BIRKENHEAD.**—Erection of a Science Class Room, etc., at the Higher Tranmere High School for Girls. Plans and particulars may be seen at the office of J. R. Mewton, 56, Hamilton Square, Birkenhead, where quantities may be obtained.

No Date. **PULTENEYTOWN.**—Erection of proposed halls for the United Temperance Association of Pulteneytown. Contractors desirous of offering for the various works are requested to send their names to George Sinclair, Architect, 95, Bath Street, Glasgow.

No Date. **GLASGOW.**—Supplying materials, etc., etc., composing these subjects forming 220, Hope Street, and 59, Renfrew Street, Glasgow, and erection of hoardings, taking down and clearing site of old buildings, and removal of debris, for the National Telephone Company, Ltd. Forms of conditions, etc., of Colin Menzies, Architect, 2, West Regent Street, Glasgow.

No Date. **BELFAST.**—Erection and completion of a theatre at the corner of Grosvenor Street and Durham Street, for the Alexandra Theatre Company, (Belfast) Limited. Quantities may be obtained on deposit of £1 1s. from the Architects, J. D. Swanston and Syme, Kirkcaldy, N.B. Plans may be inspected at the offices of the Company's Solicitors, W. B. Galway and Boas, Scottish Provident Buildings, Belfast.

ENGINEERING.

July 5. **EAST COWES.**—Supplying and fixing a 30 b.h.p. gas engine and suction gas plant, for the U.D.C. Plans, etc., can be seen, and all information obtained, from Albert E. Barton, Surveyor to the Council, Town Hall, East Cowes.

July 6. **MOTHERWELL.**—Construction of a new sewer in fire-clay pipe, cast-iron pipe, and concrete culvert, extending to 1,470 yards or thereby, for the Town Council. Drawings of the Engineer, Wm. Allan Carter, M.Inst.C.E., 51, Queen Street, Edinburgh, from whom specification and schedule of quantities can be obtained on deposit of £1 1s. Tenders to be sent to James Burns, Town Clerk, Motherwell.

July 6. **LONDON (for INDIA).**—Supplying 94 carriage underframes, with bogies and vacuum brake, complete, for the South Indian Railway Company. Specifications and form of tender may be obtained of V. E. De Broe, Secretary, Company's Offices, 91, York Street, Westminster, London, on payment of £1 (not returnable). Copies of the drawings of Robert White, M.I.C.E., Consulting Engineer to the Company, 3, Victoria Street, Westminster, on payment of 5s. (not returnable).

July 7. **MANSFIELD.**—Supplying about 160 yards of wrought iron fencing, 6ft. high, for the Union. Particulars of the Architects, Vallance and Westwick, Mansfield. Tenders to be sent to W. S. Cockerham, Clerk to the Guardians, Union Offices, Mansfield.

July 7. **MIDDLETON.**—Supply and erection of six sprinklers at the Sewage Works, Middleton, for the Corporation. Particulars, specification, and form of tender, may be obtained from W. Welburn, Borough Surveyor, Town Hall, Middleton, to whom plans of sprinklers must be sent. Tenders, addressed to the Chairman of the Surveyor's Committee, must be delivered to Frederick Entwistle, Town Clerk, Town Hall, Middleton. Fair wages clause.

July 8. **LEAVESDEN.**—Supplying and fixing a new gasholder bell, 30ft. in diameter and 11ft. 6ins. deep, at the St. Pancras Schools, Leavesden, near Watford, Herts. Specification at office of Alfred A. Millward, Clerk to the Guardians, Town Hall, St. Pancras, N.W.

July 8. **GREENWICH.**—Erection and equipment of two electric lifts at the Infirmary, Vanbrugh Hill, East Greenwich, S.E., for the Union. Specification and form of tender on application to Samuel Saw, Clerk, Union Workhouse, Woolwich Road, Greenwich.

July 8. **CHORLEY.**—Supplying 1, cast-iron water pipes, branches, and other pieces, also hydrants sluice valves, fittings, etc.; 2, excavating for and laying, fixing, and jointing cast-iron water mains, with all the necessary sluice valves, hydrants, fittings, etc., for the Nantwich R.D.C. Drawings and specifications of C. E. Davenport, A.M.I.C.E., 152, Hospital Street, Nantwich, on deposit of 5s. Tenders to be sent to H. G. Atkinson, Clerk to the Council, Rural District Council Offices, Nantwich.

July 8. **SOUTHEND-ON-SEA.**—Construction of about 2,900 yards of 33in. cast-iron sea outfall, and 1,550 yards of 39in. diameter and 2ft. 2in. by 3ft. 6in. oval concrete sewers, together with all piling, manholes, and other works, for the Corporation. General conditions, specification, bill of quantities, and form of tender, and drawings, on application to the Borough Engineer, Ernest J. Elford, M.I.Mech.E., Municipal Buildings, Southend-on-Sea, on deposit of £5 5s. Tenders to be delivered to H. J. Worwood, Town Clerk (pro.tem.), Town Clerk's Office, Southend-on-Sea.

July 12. **EAST ASHFORD.**—Supply and delivery of a 12-ton steam road roller, for the R.D.C. Particulars and form of tender of Horace Hamilton, Clerk to the Council, 11, Bank Street, Ashford, Kent. Tenders to the Chairman at the Workhouse, Willesborough, near Ashford. Contractor to take over a shis property an old 10-ton roller.

July 12. **LONDON, W.**—Supplying lead-covered paper insulated cables for year ending March 31, 1910, for the Acton U.D.C. Full particulars and form of tender from the electrical engineer, M. J. Martin Blair, 130, Churchfield Road, Acton, W. Tenders to be sent to William Hodgson, Clerk, 242, High Street, Acton, W.

July 12. **SOUTHAMPTON.**—Installation of low-pressure hot-water apparatus, at Eastleigh Derby Road Council School, for the County Council. Plans, specification, and general conditions, etc., of W. J. Taylor, County Surveyor, The Castle, Winchester, on deposit of £10 10s. Tenders to be sent to H. Barber, Clerk to the County Council, The Castle, Winchester.

July 12. **HULL.**—Heating by a low-pressure system the school buildings proposed to be erected —one school comprising two separate blocks in Sidmouth Street, and one school comprising two separate blocks, in Southcoate Lane, for the Education Committee of the Corporation. Plans, conditions, etc., with other particulars, can be obtained of Joseph H. Hirst, City Architect, Town Hall, Hull. Tenders, with schemes, are to be addressed to the Chairman of the Finance and General Purposes (Education) Sub-Committee, and delivered at the Town Clerk's Office, Hull.

July 13. **ROTHERHAM.**—Supplying electricity meters according to the requirements of the Electric Light Department, for the Corporation. Further particulars can be obtained of the Borough Electrical Engineer. Tenders to be sent to W. J. Board, Town Clerk, Town Hall, Rotherham.

July 13. **PADDINGTON (near Nottingham).**—Providing and laying about five miles of cast iron water mains, with all necessary special castings and valves, together with service connections, etc., in Ruddington, near Nottingham, for the Basford R.D.C. Plans and specifications may be seen by appointment, and copies of the bills of quantities, and forms of tender, obtained from S. Maylan, Engineeer and Surveyor, Public Offices, Basford, Nottingham, on deposit of £2 2s. Tenders to be delivered to Henry Stone, Clerk to the Council, Public Offices, Basford, Nottingham.

July 22. **WIMBLEDON (SURREY).**—Schemes for heating the Isolation Hospital, Gap Road, and tenders for carrying out the work, for the Corporation. Conditions and plans of existing and proposed buildings, of the Borough Surveyor, Town Hall, Wimbledon, on deposit of £1 1s. Tenders addressed to the Chairman, Sanitary Committee.

July 24. **DUBLIN.**—Schemes for warming the new technical schools, Bolton Street, Dublin, for the Technical Education Committee. Particulars at the office of the City Architect, Municipal Buildings, Cork Hill, Dublin.

August 2. **WINNIPEG, CANADA.**—Equipment of generating station. Specifications, etc., at the office of "Engineering," London, England. Copies of the instructions may be obtained from the Power Engineer's Office, Carnegie Library Building, Winnipeg, and at the office of "Engineering," London, England.

No Date. **LEDSTONE (near KIPPAX).**—Sinking a shaft 18ft. finished diameter, for the Micklefield Coal and Lime Co. (Ltd.). Particulars may be obtained from J. G. Linneker, Manager.

IRON AND STEEL.

July 3. **BARNSTAPLE.**—Supplying and fixing about 120 yards run of unclimbable iron fencing at the Portmarsh Field, for the T.C. Particulars can be obtained from S. Y. Saunders, P.A.S.I., Borough Surveyor, The Strand, Barnstaple, to whom tenders are to be sent.

July 5. **DUBLIN.**—Supplying 1,500 tons or 3,000 tons of 90lb. steel bullhead rails, with the necessary fishplates, and 500 or 1,500 tons of cast-iron chairs, for the Great Northern Railway Co. (Ireland). Specifications and forms of tender from the Secretary on payment of 1s. (not returnable). Tenders should be delivered to T. Morrison, secretary, Amiens Street, Terminus, Dublin.

July 7. **EDINBURGH.**—Supplying a quantity of cast-iron pipes 16 inches in diameter, weighing about 219 tons, for the Edinburgh and District Water Trust. Drawings may be seen, and copies of specification and forms of tender may be obtained, at the Superintendent's Office, 12, St. Giles Street, Edinburgh. Tenders must be sent to William Boyd, W.S., Clerk to the Trust, Water Trust Chambers, 12, St. Giles Street, Edinburgh.

July 8. **SOUTHEND-ON-SEA.**—Supply and delivery of approximately 1,450 tons of 33in. cast-iron turned and bored pipes and specials, for the Corporation. General conditions, specifications, form of tender, and drawings, of the Borough Engineer, Ernest J. Elford, M.I.M.E., Municipal Buildings, Southend-on-Sea. on deposit of £5 5s. Tenders to be delivered to H. J. Worwood, Town Clerk, pro. tem., Southend-on-Sea.

July 9. **HULL.**—Execution of steel roof work in an extension of the Madely Street Baths, for the Corporation. Forms of tender and other particulars may be obtained on deposit £1 with A. E. White, M.InstC.E., City Engineer, Town Hall, Hull. Prints of contract plan will be supplied on payment of 2s. 6d. not returnable. Remittances must be made payable to T. G. Milner, City Treasurer. Tenders to be sent to the Chairman of the Baths Committee, at the Town Clerk's Office.

July 13. **MANCHESTER.**—Supplying special (permanent way) track work, for the Tramways Committee. Specifications, etc., of J. M. M'Elroy, general manager, Corporation Tramways, 55, Piccadilly, Manchester, on deposit of £2 2s. Tenders to be addressed to the Chairman of the Tramways Committee, 55, Piccadilly, Manchester.

July 14. **LEEDS.**—Supplying the following for the ensuing year, for the Corporation:—Copper lamps, lamp pillars, lamp furniture, pillar lamp irons and carriages, wall bracket irons, sheet copper and copper tops for lamps, and glass for lamps. Further particulars and forms of tender of the Superintendent of Street Lighting, Springwell Street Depot. Tenders to be sent to Robert E. Fox, Town Clerk, Town Hall, Leeds.

July 14. **MANCHESTER.**—Supplying about 3,600 tons of welded steel pipes and collars, 44ins. and 40ins. diameter, for the Waterworks Committee. Specification, etc., of G. H. Hill and Sons, civil engineers, Albert Chambers, Albert Square, Manchester, and 3, Victoria Street, Westminster, upon receipt of cheque for £2 2s. deposit. Tenders, addressed to the Chairman of the Waterworks Committee, must be forwarded to the Secretary, Waterworks Offices, Town Hall, Manchester.

July 22. **SWANSEA.**—Supply, delivery, and erection at the South Dock Basin, Swansea, of—One framed and braced steel single-storied shed, 117ft. long by 60ft. wide in two spans of 30ft. with curved roof, part of the sides and ends of corrugated iron respectively, for the Swansea Harbour Trustees. Forms of tender can be obtained and plan and specification inspected on application to Talfourd Strick, Clerk, Harbour Offices, Swansea, to whom tenders are to be sent.

Sept. 1. **LONDON, for BRISBANE (QUEENSLAND).**—Supplying 42in. and 48in. steel pipes, or 42in. and 48in. wrought iron pipes, or 42in. and 48in. cast-iron pipes, for the Brisbane Board of Water Works. Specifications and drawings may be obtained at the office of the engineer to the agent-general for Queensland, 409 and 410, Strand, London, W.C., on payment of £3 3s. Tenders must be sent addressed to the secretary, Brisbane Board of Water Works, Brisbane, Queensland.

PAINTING.

July 6. **GREAT YARMOUTH.**—Outside painting and inside colouring work at the School of Science and Art, 59, South Quay, for the Corporation. Specifications and forms of tender at the office of the Borough Surveyor, Town Hall, Great Yarmouth. Tenders to be delivered to F. W. Wroughton, Clerk to the Committee, 28, South Quay, Great Yarmouth.

July 7. **MACCLESFIELD.**—Cleaning down and painting for Nether Alderley, Over Alderley, and Mottram St. Andrew Council Schools, for the Administrative Sub-Committee for the Macclesfield and Hayfield Unions area. Specification from Frederick May, clerk to the Committee, Church Side, Macclesfield, to whom tenders are to be sent.

July 7. **BEVERLEY.**—Painting and cleaning certain schools during the summer holidays, for the Education Committee of the East Riding of the County of York. A list of schools may be obtained from John Bickersteth, Clerk to the East Riding Education Authority, County Hall, Beverley, of whom all particulars may be obtained, and to whom tenders are to be sent.

(*Continued on next page.*)

CARTER & CO., Ltd., POOLE, DORSET.
TELEGRAMS: "TILES, POOLE."
LONDON OFFICE: 29, ALBERT EMBANKMENT, S.E.
MANCHESTER OFFICE: 100 DEANSGATE.
Manufacturers of Floor, Wall, and Hearth Tiles, Keramic Mosaic, Terra Cotta and Constructional Faience, Fireplaces, &c.
DESIGNS FURNISHED FOR PUBLIC BUILDINGS.
Illustrated Catalogue Free on Application. *Architects' Suggestions embodied in Special Designs.*

"LIMPET" PATENT BOLTS & WASHERS
FOR CORRUGATED IRON SHEETS.

"There is no doubt in our mind that they ought to be regularly specified where iron sheeting is used."—*Vide* BUILDERS' JOURNAL.
PRICE'S PATENT
The latest and most approved Fixing for joining Corrugated Iron Sheeting together.
REGISTERED TRADE MARK
LIMPET
Their great feature is the way in which they adjust themselves to the corrugation and make an **absolutely watertight joint.** They also retard the corrosive action in Galvanized Sheets and combine other advantages.
EXCLUSIVELY ADOPTED BY THE INDIAN GOVERNMENT, THE LEADING RAILWAYS AND MANY OF THE LARGEST MANUFACTURING CONCERNS IN ENGLAND AND THE COLONIES.
Full particulars and samples from the Managing Agents
WILLIAM JACKS & CO., 5, East India Avenue, LONDON, E.C.
Agents for Scotland: Frank G. Price & Co. 53, Waterloo St., Glasgow.

July 5. **BRISTOL.**—Interior painting, etc., at the Children's Homes at Downend, in accordance with the specification, which is deposited for inspection, for the Guardians of the Poor. Tenders must be sent to J. J. Simpson, Clerk to the Guardians, St. Peter's Hospital.

July 7. **GLAMORGAN.**—Execution of the following works, for the Glamorgan County Council: 1.—Painting and cleaning work at various schools in the Western Division, and the Eastern Section. 2.—Erection of new school at Llanrhidian. 3.—Foundations for temporary school building at Loughor. 4.—Erection of higher elementary school at Caerphilly. 5.—Minor improvements at the Council School at Brithdir. 6.—Unclimbable iron fencing for Aberdare County School Recreation Field. Plans and specification may be seen and bills of quantities and form of tender obtained for No. 2 at the Gowerton County Police Station, and for No. 4 at the Caerphilly Police Station. Plans may be seen and specification and form of tender obtained for No. 3 at the Loughor Council School, for No. 5 at the Brithdir County School, and for No. 6 at the Aberdare Police Station. Specification and form of tender for the painting of schools will be obtainable at the respective schools. The plans, specification, etc., of all the works may be seen or obtained at the Council offices. Tenders are to be delivered to T. Mansel Franklen, Clerk of the County Council, Glamorgan County Council Offices, Westgate Street, Cardiff.

July 8. **TROWBRIDGE.** — Painting, repairing bier-house, at Trowbridge Cemetery, for the Trowbridge and Staverton Burial Joint Committee. Particulars and specifications may be seen on application to H. G. Nicholson-Lailey, at the Town Hall. Tenders to be sent to W. J. Mann, Clerk to the Committee, Union Street, Trowbridge.

July 10. **HALLING, KENT.**—Painting and general repairs at the Council School, for the Education Committee. Specifications from F. W. Jessup, The Ferns, Halling, Rochester, to whom tenders are to be sent.

July 12. **BLACKBURN.**—Painting, etc., at various schools in the Borough, for the Corporation. Applications should be made to William Stubbs, A.M.I.C.E., Borough Surveyor, Municipal Offices, Blackburn, to whom tenders are to be sent.

July 12. **ECCLES.**—Painting and decorating the interior and exterior of the Carnegie Public Library, for the Corporation. Specification and form of tender, on deposit of £1 1s. with Edwin Parkes, Town Clerk, Town Hall, Eccles, to whom tenders are to be sent. Drawings may be inspected at the office of the hon. Architects, Potts and Hennings, 34, Victoria Buildings, Victoria Street, Manchester. Fair wages clause.

July 13. **LONDON, S.E.**—Cleaning, painting, etc., at the Infirmary, Brook Street, Kennington Road, S.E., for the Guardians of the Poor of the Parish of Lambeth. Tenders to be sent to James L. Goldspink, Clerk, Guardians' Board Room and Offices, Brook Street, Kennington Road, S.E., to whom forms of tender and specification may be obtained on deposit of £2.

July 15. **FULHAM.**—Painting and cleaning works at the infirmary, St. Dunstan's Road, Hammersmith, and the Receiving Home for Children, 9, Parson's Green, Fulham, for the Guardians of the Poor. Forms of tender, etc., of E. J. Mott, Clerk to the Guardians, Guardians' Offices, 129, Fulham Palace Road, Hammersmith, W., to whom tenders are to be sent.

July 16. **CHARTHAM DOWNS.**—Painting and repairs to Section No 3 at the Kent County Lunatic Asylum, Chartham Downs, near Canterbury. Drawings, etc., of W. J. Jennings, architect, 4, St. Margaret's Street, Canterbury. Bills of quantities on deposit of £5.

No Date. **SILVERDALE.**—Painting and decorating the interior of Bethel Church. Specifications and particulars of A. E. Wright, 14, Kinsey Street, Silverdale.

PLUMBING AND SANITARY.

July 5. **NEWPORT.**—Construction of sanitary conveniences in the Market House, Guildhall, Newport, I.W., for the Corporation. Plans, specifications, etc., of T. Ross Pratt, Town Clerk, 19, Quay Street, Newport, to whom tenders are to be sent.

July 5. **BATLEY.**—Erection and completion of conveniences at Carlinghow Council Schools, for the Corporation. Particulars, quantities, and forms of tender of Oscar J. Kirby, Borough Enginer, Town Hall, Batley. Tenders to be sent to G. R. H. Danby, Secretary and Director.

July 5. **STEPNEY, E.**—Construction of two underground conveniences in Horseferry Branch Road, by Commercial Road East, Ratcliff, E., for the Corporation. Drawings and bill of quantities, etc., of the Borough Engineer, M. W. Jameson, A.M.Inst.C.E., Municipal Offices, Great Alie Street, Whitechapel, E., upon deposit of £5 Bank of England note. Tenders to be sent to Geo. W. Clarke, Town Clerk, Municipal Offices, Great Alie Street, E.

July 6. **RAWTENSTALL.**—Construction, in Cowpe Road, within the Boroughs of Rawtenstall and Bacup, of a 12in. and 9in earthenware pipe sewer, together with manholes, lampholes, etc., for the Corporations. Plans and specification, bill of quantities, and forms of tender, on application to James Johnson, Borough Engineer, Municipal Offices, Rawtenstall, or William Henry Elce, Borough Engineer, Bacup, on deposit of £1 1s. Tenders to be addressed to James Whalley, Town Clerk, Rawtenstall.

July 6. **LONDON.**—Construction of a sewer, mainly of cast-iron, lined with concrete, and blue brick, of 6ft. to 8ft. internal diameter, and of a total length of about 42,450ft., to be formed mainly in tunnel, together with penstock and weir chambers, and other incidental works, from Northside, Wandsworth Common, Battersea, to the Deptford pumping station, Greenwich, for the L.C.C. Drawings, specifications, bills of quantities, form of tender, and other particulars, of the chief engineer, Maurice Fitzmaurice, C.M.G., at the County Hall, Spring Gardens, S.W., upon deposit with the cashier of the Council of £10. Tenders to be delivered at the County Hall, addressed to the Clerk of the L.C.C., Spring Gardens, S.W.

July 7. **BARROW-IN-FURNESS.**—Erection of conveniences in the Public Park. Plans may be seen, and bills of quantities obtained, at the Borough Engineer's office.

July 7. **WETHERBY.**—Construction of about 3,040 lineal yards of 9in., 8in., and 6in. earthenware pipe sewers, with manholes, etc.; also sewage tanks, continuous filters, and other works, for the R.D.C. Drawings, etc., of the Engineer, H. A. Johnson, M.Inst.C.E., 15, The Exchange, Bradford; also of E. H. Coates, Solicitor, Wetherby, on deposit of £2 2s. Tenders to be sent to E. H. Coates, Clerk to the Council, Wetherby.

July 7. **EDINBURGH.**—Cutting tracks for and laying and jointing about 1½ miles of 6 in. cast iron pipes, for Edinburgh and District Water Trustees. Plans may be seen and copies of the specification and schedule obtained at the office of the Engineer, W. A. Tait, C.E., 72a, George Street, Edinburgh, on deposit of £1. Tenders to be sent to William Boyd, W.S., Clerk to the Trust, Edinburgh and District Water Trust Offices, St. Giles Street, Edinburgh.

July 8. **BRIGHTON.**—Supplying glazed drain pipes, for the Corporation. Specification, etc., of the Borough Surveyor, Town Hall, Brighton. Tenders to be sent to Hugo Talbot, Town Clerk, Town Hall, Brighton.

July 8. **TROWBRIDGE.**—Rebuilding w.c. at Trowbridge Cemetery, for the Trowbridge and Staverton Burial Joint Committee. Particulars and specification may be seen on application to H. J. Nicholson-Lailey, Town Hall. Tenders to be sent to W. J. Mann, Clerk to the Committee, Union Street, Trowbridge.

(*Continued on next page.*)

Farrer's Automatic Sewage Distributor

ENSURES THE BEST EFFLUENT.

HUNDREDS IN USE.

WILLIAM E. FARRER,
Star Works, Cambridge Street,
BIRMINGHAM.
Also
LONDON, CARDIFF, LEEDS.

BROOM & WADE,
ENGINEERS, LTD.,
HIGH WYCOMBE.
POWER HOISTS for BUILDERS.

Always Ready for Use.
No Skilled Attention Required.

Driven by
PARAFFIN, PETROL or ELECTRIC MOTORS
2 cwt., 4 cwt. and 6 cwt. loads.

27, CLEMENT'S LANE, E.C.
Telegrams: "Inbrake, London." Telephone: 15133 Central.

July 10. **BELFAST.**—Internal plumbing work in connection with the Purdysburn Villa Colony Asylum (No. 1 Contract), for the Corporation. Specifications and particulars on application to the Architects, Graeme Watt and Tulloch, 77a, Victoria Street, on deposit of £1. Tenders to be sent to R. Meyer, Town Clerk.

July 10. **MENABILLY.**—Laying new main sewers and constructing manholes on the Tower Park Estate, Fowey, for J. C. S. Rashleigh, M.D. Plans and specifications at the Estate Office, Menabilly, Par Station. Tenders to be sent to W. H. Polglaze, Surveyor, Menabilly Estates Office, Menabilly, Par Station.

July 13. **BASFORD.**—Construction of about 300 yards of 9in. pipe sewer in the Parish of Selston, and small extension of sewer in the Parish of Kimberley, with necessary manholes, flushing chambers, and ventilation shafts, for the R.D.C. Plans and specification and copies of the bills of quantities from S. Maylan, Engineer and Surveyor, Basford Public Offices. Tenders are to be delivered to Henry Stone, Clerk to the Council, Public Offices, Basford, Nottingham.

July 15. **CROMPTON.**—Construction of timber-framed separating tanks, filters (of brick and concrete) and equalising tanks, etc., for the U.D.C. Plans, etc., of the Engineer, J. P. Wilkinson, M.Inst.C.E., 301-4, Cathedral Street, Manchester, on deposit of £1 1s. Tenders must be sent to F. F. Gartside, Clerk, Clerk's Office, Town Hall, Shaw, near Oldham.

No Date. **BEVERLEY.**—Plumbing work in connection with the show of the Yorkshire Agricultural Society. Specification, etc., on application to Fredk. Pottage, Clerk of Works, Yorkshire Show Yard, Beverley.

No Date. **MERTHYR TYDFIL.**—Removal of old iron lavatories in various Council schools, and provision of new glazed stoneware lavatories with modern fittings complete, for the Education Department. Particulars can be obtained from the Deputy Surveyor.

ROADS AND CARTAGE.

July 3. **NEW WINDSOR.**—Making-up a portion of York Road, within the Borough for the Corporation. Plan and specification may be seen, and form of tender obtained, on application to E. A. Stickland, Borough Surveyor, Alma Road, Windsor. Tenders are to be sent to E. Cecil Durant, Town Clerk, 3, Park Street, Windsor.

July 3. **SWANSEA.**—Paving with tar macadam a portion of the playgrounds of the following Council schools:—Terrace Road, Dyfatty, Plasmarl, and Martin Street, Morriston, for the Corporation. Particulars may be obtained from Marcus Hoskins, F.S.I., Borough Estate Agent, Coleridge House, Swansea. Tenders are to be sent to A. W. Halden, Clerk, Education Offices, Swansea.

July 5. **CONNAH'S QUAY.**—Execution of street works in various streets, for the U.D.C. Plans and specifications and quantities and form of tender at the office of the Surveyor, W. E. Hughes, Council Offices, Connah's Quay, upon deposit of £1 1s. Tenders to be sent to Thomas W. Hughes, Clerk to the Council, Connah's Quay.

July 5. **WHITKIRK, near LEEDS.**—Making-up Carter Avenue, Carter Lane, Carter Mount, Back Carter Mount, Carter Terrace, and Back Carter Terrace, all at Whitkirk, in the parish of Templenewsam, near Leeds, for the Hunslet R.D.C. Plans, specifications, and quantities, of W. B. Pinder, Clerk to the Council, Glasshouse Street, Hunslet, Leeds, to whom tenders are to be sent.

July 5. **LONDON, W.**—Execution of Creosoted deal block paving, and the supply of necessary materials, for the Corporation of Paddington. Conditions, specifications, and further particulars, of the Borough Surveyor, Town Hall, Paddington, W. Tenders to be sent to A. W. J. Russell, Town Clerk, Town Hall, Paddington, W.

July 5. **EAST DEREHAM.**—Supplying 350 tons (more or less) of 2¼in. broken granite, and 350 tons (more or less) of 1¾in. broken granite, to be delivered free, for the U.D.C. Forms of tender on forwarding stamped addressed envelope to the Surveyor, H. G. Himson, Theatre Street, East Dereham. Tenders to be sent to B. H. Vores, Clerk to the Council.

July 5. **SOUTHFIELD, S.W.**—Works of repair upon Granville Road, Southfield, for the Corporation of Wandsworth. Specification and drawings, and forms of tender, at the Borough Engineer's Office, New Streets Department, 56, East Hill, Wandsworth, S.W. Tenders must be delivered at the Council House, East Hill, Wandsworth, S.W., and placed in the box provided. Fair wages clause.

July 6. **HANDSWORTH (STAFFS).**—Making Arden Road, under the Public Health Act, 1875, Section 150, for the U.D.C. All particulars may be obtained from H. Richardson, Assoc.M.Inst.C.E., Surveyor to the Council, to whom tenders are to be sent. Fair wages clause.

July 6. **HAILSHAM.**—Levelling, metalling (kerbing and channelling on one side), and making good Gordon Road, and levelling, metalling, kerbing, channelling, and paving and making good Windsor Road, for the R.D.C. Plans and section and specification, bill of quantities, and form of tender, on deposit of 10s. Tenders to be sent to Edmund Catt, Clerk, Council Offices, 17, London Road, Hailsham.

July 6. **BROMLEY.**—Supplying 4,800 cubic yds. of broken stone, i.e., Guernsey granite, Leicester granite, Cherbourg quartzite, Dean soverack, basalt or Penmaenmawr, to be delivered free, as desired by the Corporation; also 966 cubic yds. of broken surface or pit flints. Tenders, on forms, which can be obtained on deposit of 10s., must be sent, accompanied by samples, to Fred. H. Norman, Town Clerk, Municipal Offices, Bromley, Kent.

July 7. **KILMUIR.**—Making a new road from Portree to Eastside, Kilmuir, about twelve and a half miles, including ten bridges. Plans, etc., to be seen with John Mackenzie, Road Surveyor, Portree.

July 7. **BARKING.**—Paving, with granite setts, certain portions of the macadam margins in London Road, for the U.D.C. Plans, etc., of C. F. Dawson, Surveyor to the Council, Public Offices, Barking. Tenders to be sent to H. Hargreaves, Clerk to the Council, Public Offices, Barking.

July 7. **READING.**—Making-up Elgar Road, for the Urban Sanitary Authority. Drawings may be seen, and specifications and general conditions and forms of tender obtained, of John Bowen, Assoc. Mem.Inst.C.E., Borough Engineer and Surveyor, Town Hall, Reading, to whom tenders are to be sent. Fair wages clause.

July 7. **LONDON, S.E.**—Repairs to tar paving at the Park Fever Hospital, Hithergreen, Lewisham, S.E., for the Metropolitan Asylums Board. Drawings, conditions, etc. (prepared by W. T. Hatch, M.Inst.C.E., M.I.Mech.E., Engineer-in-Chief), at the office of the Board, Embankment, E.C., on deposit of £1 1s. Tenders to the office of the Board.

July 7. **WELLINGTON, SALOP.**—(1) Getting, breaking, and stacking 200 cube yards of rock at Lawrence's Hill, near Wellington; (2) 630 cube yards of broken rock, suitable for streets, delivered at Wellington Station, for the U.D.C. Specifications and further particulars of Geo. Riley, Surveyor to the Council, 14, Walker Street, Wellington, Salop. Tenders must be sent to J. W. Littlewood, Clerk to the Council, Bank Chambers, Wellington, Salop.

(Continued on next page.)

FIBRO-CEMENT SHEETS

AND SLATES (Patented)

PANELLING OF A DINING-ROOM.

The ceiling and panelling of this room, as well as the door casing, mouldings and door panels are done with Fibrocement.

A panelling of this kind costs less with Fibrocement than if done with wood, as all glueing and assembling is replaced by a simple nailing and the superposition of sheets of various thicknesses.

Compared with wood panels, ours have the great advantage of never "playing" and never giving occasion to numerous joints of paint inevitable with wood panels.

Fibrocement never rots. Once fixed to the wall, it in no way loses its shape.

Write for further particulars to

C. ZERENNER & Co., *Original introducers of Asbestos Slate and Contractors to H.M. Government.*

Norfolk House, Laurence Pountney Hill, LONDON E.C.

Wholesale Distributing Agents Wanted,

Telegrams: "ZERENNERS, LONDON." Telephone: CENTRAL No. 11627 LONDON.

June 9. **ROMSEY.**—Supplying on hire a steam roller for year ending March 31, 1910, for the R.D.C. Full particulars and form of tender of C. W. Chiddy, Surveyor, Romsey. Tenders to be delivered to Jno. Allsop, Clerk, The Abbey, Romsey.

July 12. **WEYMOUTH.**—Supplying 100 yards of Portland stone chipping (without dust), for the R.D.C. Tenders to be delivered to H. A. Huxtable, Clerk, Bank Chambers, Weymouth.

July 12. **SOUTH MOOR AND OXHILL.**—Forming and completing several private streets at South Moor and Oxhill, for the Stanley U.D.C. Plans, sections, and specifications, etc., from Joseph Routledge, Surveyor, Council Offices, Stanley. Tenders to be sent to John Geo. Ridley, Clerk to the Council, Stanley, S.O., Co. Durham.

July 12. **ILFORD.**—Levelling, metalling, and making good Ladysmith Avenue, for the U.D.C. Specification, etc., of H. Shaw, M.I.C.E., Surveyor, Town Hall, Ilford, on deposit of £2 2s. Tenders to be sent to J. Godfrey Gott, Deputy Clerk, Town Hall, Ilford.

July 12. **LOUGHTON.**—Supplying granite, 500 tons broken, to pass 1¾in. ring, for the U.D.C. Steam roller also, for scarifying and steam rolling granite when laid. District Surveyor to the Council will supply all information required. Tenders to be sent to J. H. Hayward, Clerk, pro tem., to the Council, Council Offices, Loughton, Essex.

July 12. **BARNES.**—Paving carriageways of the Upper Richmond Road, Mortlake, and unpaved portion of High Street, Mortlake, with creosoted Swedish real blocks laid on a concrete foundation, for the U.D.C. Plans, etc., of G. Bruce Tomes, Assoc.M.Inst.C.E., Surveyor to the Council, The Council House. High Street, Mortlake, S.W., to whom tenders are to be sent.

July 14. **BRIGHOUSE.**—Re-paving Bethel Street with local setts on concrete (the setts being provided), with re-flagging and other sundry work, for the Corporation. Plans, etc., of S. S. Haywood, Borough Engineer and Surveyor, Municipal Offices, Brighouse. Tenders to be sent to James Parkinson, Town Clerk.

July 20. **STEYNING (SUSSEX).**—Carrying out road improvements in Upper Beeding, for the R.D.C. (a) Widening the road at East Mead; (b) raising the level of road at the bottom of Small Dole Hill, and providing new culvert; (c) lowering the gradient of Small Doll Hill. Drawings and specification from Frederick Slaughter, Assoc.M.Inst.C.E., High Street, Steyning. Tenders to be sent to Arthur Flowers, Solicitor, Clerk to the Council, Union Offices, Ham Road, New Shoreham.

MISCELLANEOUS.

July 5. **BRISTOL.**—Installation of a washing machine at the Stapleton Workhouse, for the Guardians of the Poor. Tenders to be sent to J. J. Simpson, Clerk to the Guardians, St. Peter's Hospital, of whom particulars may be obtained.

July 6. **ASPULL.**—Labour in cutting and laying 3in. and 4in. drain tiles, on a portion of Aspull Moor, for the D.C. Plans and sections can be seen at the Council Offices, Aspull. Also for 6,000 3in. and 4,000 4in. drain tiles, delivered near the Council Offices. Tenders to be sent to L. Athron, Clerk, Council Offices, Aspull.

July 6. **LONDON.**—Supplying (a) cupboards, time-table frames, mirrors, tables, stools, steps, extension ladders, etc.; (b) chairs; (c) "Sheffield" desks; (d) blinds; for the L.C.C. Full particulars may be obtained on application to G. L. Gomme, Clerk of the London County Council, County Hall, Spring Gardens, S.W., to whom tenders are to be sent.

July 7. **LONDON.**—Cleansing various wards, etc., at the Infirmary, High Stret, Homerton, N.E., for the Guardians. Specification, etc., of Frank R. Coles, Clerk to the Guardians, Clerk's Offices, Sidney Road, Homerton, N.E., to whom tenders are to be sent.

July 9. **TROWBRIDGE.**—Supplying garden seats and four stools, new and second-hand, also fixing corrugated iron on the entrance gates, for the Trowbridge and District Joint Isolation Hospital. Particulars may be obtained on application to W. J. Mann, Clerk, Union Street, Trowbridge.

July 10. **LEITH.** — Laying Portland cement concrete in various back courts in the Burgh, amounting to about 2,235 superficial yards, for the Provost, Magistrates, and Councillors. Specifications and form of tender may be had, and any information obtained, at the Burgh Surveyor's Office, Charlotte Street, Leith. Tenders, to be sent to T. B. Laing, Town Clerk, Town Clerk's Office, Leith.

No Date. **CARLISLE.**—Supplying wrought iron pens, concrete floors, and drainage, at Mart, Earl Street, for the Hetherington's Auction Co., Ltd., Plans and specification, etc., of Joseph Graham, Architect, 28, Castle Street.

Insurance.

Free £500 Accident Insurance Coupons have been sent to the following:

E. B. (Bournemouth), H. S. (Hereford), A. B. B. (Shrewsbury), J. C. (Keighley), J. S. (Manchester), H. D. A. (Putney), W. C. W. (Halifax), J. S. H. (London, E.C.), G. P. D. S. (Plymouth), T. M. (Fareham), H. E. (Burton-on-Trent), J. R. P. (Edinburgh), J. R. S. (Edinburgh), J. H. (Llangollen), J. C. (Manchester), T. H. S. (York), S. T. (Bournemouth), A. H. S. (Harpenden), J. F. S. (Merthyr Tydfil), C. E. T. (Grimsby), W. J. C. (London, N.W.), P. B. (Long Eaton), C. O. G. (Wellingborough), D. M. S. (Glasgow), H. W. S. (Northampton), J. B. (Bristol), W. H. W. (London, W.), A. G. (Manchester), D. H. L. (Sheffield), G. A. W. C. (Shoreham), E. G. K. (Kentish Town), A. M. H. J. (Borth), F. C. W. (Aldershot), H. F. (New Wandsworth), F. M. (Keighley), G. O. (Norwich), D. A. F. (Chertsey), J. F. J. G. (Leicester), W. M. (Hindley), R. B. (Leamington Spa), C. S. (London, S.E.), W. D. W. (Nottingham), R. K. D. (Putney).

R. C. (Harrogate), C. F. A. V. (London, W.), T. H. P. (East Hom), J. C. P. (London, E.C.), A. W. G .H. (Streatham), A. G. (Hull), J. E. J. (Bickley), A. V. S. (Stockport), J. B. (Blackpool), J. R. E. (Stainland), S. A. R. (North Walsham), J. T. B. (Ramsey), W. V. (Newport, Salop), J. H. B. (Leeds), L. L. J. (Carnarvon), T. B. (Birmingham), E. R. (Cork), D. E. F. (Waterford), S. P. P. (Leicester), C. K. (Plymouth), G. H. (London, W.), A. S. (Reading), E. H. (Brighton), W. W. (London, W.), T. R. M. (Sunderland), J. B. M. (Manchester, S. U. (March), H. S. (London, E.C.), H. L. P. (Sheffield), A. A. B. (Chadwell Heath), H. J. W. (Bermondsey), W. J. (Colwyn Bay), H. T. B. (London, E.C.), J. J. B. (Birmingham), J. A. S. (Basingstoke), T. B. (Liverpool), W. F. (London, W.), H. B. (London, W.C.), R. M. L. (Southampton), H. K. (Parkstone), D. M. (Forest Gate), J. T. W. (Edinburgh), J. S. C. (Penmaenmawr), A. E. H. (Truro), G. W. W. (Reading), A. S. (Glasgow), [illegible] G. (Hereford), G. H. (Cardiff). A. S. C. (Edinbu[illegible] O. (Warrington), J. R. F. (Leeds).

For particulars of our Free Insurance Scheme, apply to the Manager, Technical Journals, Ltd., Caxton House, Westminster.

RICHARD CRITTALL & Co.,
197, Wardour Street, London, W.
— EXPERTS IN —
Mechanical Ventilating and Warming.
Manufacturers of the
HONEYMAN VENTILATOR,
An Automatic Exhaust Ventilator for which no Turret or Cowl of any kind is required.
Leading Licensees for the
BARKER PATENT "CABLE" SYSTEM
of Heating by Low-Pressure Hot Water.
Plans and Estimates prepared Free.
Telegraphic Address: "CRITTALL," LONDON. Telephone: 4416 Central.

WE PREPARE VENTILATING SCHEMES TO HARMONISE WITH THE DESIGN.

Appointments Wanted.

The charge for Advertisements under this heading is 1s. 6d. per insertion for the first four lines, and 6d. per line afterwards, prepaid. Three insertions may be had for the price of two. Advertisements can be received up to 5 o'clock on Monday evening.

ABLE Draughtsman (24), 9 years' experience; structural and ornamental ironwork, desires post in London or Southampton, office or outdoor.—Z., 36, Bartholomew Villas, London, N.W. 5082

ACADEMY (Royal) exhibitor prepares perspectives on moderate terms; specimens sent; also designs, plans from rough sketches, drawings, tracings, competition work, etc.—Box 4983, Builders' Journal Office.

ADVERTISER, with six years' practical experience and a knowledge of bookkeeping and office routine, desires situation in builder's or estate agent's office.—C. J. Mounter, 24, Hillfield Road, West Hampstead, N.W. 5028

AN Architect's junior assistant desires appointment, 5½ years' experience, Lancashire office preferred; specimen drawings, certificates for construction; good references.—J. S. H., Withington Lane, New Springs, Wigan. 5112

ARCHITECT'S Assistant desires engagement, 11 years' first-class experience in public, domestic, and asylum work; specifications and supervision, etc.—Box 5124, Builders' Journal Office.

ADVERTISER (19) seeks Situation as Draughtsman, 4½ years' experience; working drawings from rough sketches, good tracer and colourist, knowledge of reinforced concrete construction.—Apply, Box 5106, Builders' Journal Office.

ARCHITECT'S Assistant, 28, desires engagement, expert designer and draughtsman, excellent colourist, thorough knowledge construction, detail specifications, perspectives; Royal Academy Exhibitor.—Box 5147, Builders' Journal Office.

ARCHITECT'S Assistant (23), disengaged, 5½ years with education surveyor; neat draughtsman, specifications, assist quantities, supervision, reporting, surveying, levelling, typewriting; excellent references.—Box 5129, Builders' Journal Office.

ARCHITECT'S and Surveyor's Assistant, P.A.S.I., nearly 7 years' experience, working drawings, details, quantities, land surveying, etc.; excellent references; moderate salary.—C. E. Plant, 3, Kelvin Grove, Cheetham, Manchester. 5141

ARCHITECT and Surveyor's Assistant desires engagement, 15 years' experience; working drawings, details, surveys, specifications, levelling, and general routine; excellent references; moderate salary.—O. R., South View, Church Road, Egham. 5095

ARCHITECT'S Junior Assistant, 5 years' experience, neat draughtsman, competitive and domestic work, contract drawings, details, perspectives, assist quantities; honours construction; low salary.—W. Ernest Clarke, Cheam Road, Ewell. 5091

ARCHITECT'S Assistant, excellent draughtsman, desires re-engagement, six years' first-class experience, working drawings, perspectives (Exhibition Royal Academy), specifications, prizeman for architectural design; moderate terms.—F. E. T., 10, Cobham Road, Kingston-on-Thames. 5137

ARCHITECT'S Assistant, 22, qualified, thoroughly caable, well educated, with experience in reinforced concrete; medallist and bursar Glasgow School of Architecture; neat and quick draughtsman, desires appointment for summer months; England preferred; salary moderate.—350, William Porteous and Co., Glasgow. 5110

ARCHITECT'S Assistant (23) desires engagement in London office, 8 years' experience, working drawings, details, perspectives, assist quantities; salary 30s.—Box 5131, Builders' Journal Office.

ARCHITECT'S and Surveyor's Assistant (25), 9, years' London experience; working drawings, designs, specifications, supervision, etc.; land surveying, and assist with quantities; prizeman and medallist.—W., 20, Holmewood Road, Streatham Hill, S.W. 5136

ARCHITECT and Quantity Surveyor renders professional assistance, at own office, or elsewhere; any period or distance; contract, competition, perspective drawings.—Box 5104, Builders' Journal Office.

ARCHITECT'S Assistant required in Rhondda Valley, must be fully qualified.—Apply, stating qualifications, age, salary required, and enclose testimonials, to Box 5143, Builders' Journal Office.

ARCHITECT'S Junior Assistant desires engagement, three years' experience; working plans from rough sketches, good tracer, colourist, and typist; levelling; small salary.—B., 15, Marine Parade, Brighton. 5088

ARCHITECT'S Assistant, member Society Architects, first-class man, 12 years' experience, high-class artistic and practical work; drawings, details, specifications, assist quantities, age 27.—Norman K. Jackson, Epworth House, Temple Street, Sidmouth. 5130

A.R.I.B.A., disengaged shortly, London training; chief and senior assistant in leading provincial offices; expert designer, and experienced in all branches.—A. G., "Beverley," Yardley Wood Road, Moseley, Birmingham.

ARCHITECT'S Assistant (22), desires re-engagement in London office; contract drawings, details, surveys, double scholarship holder; Stage III. Building Construction.—Smeed, 24, West Ham Lane, Stratford, E. 5050

ARCHITECT, prepares designs, working drawings, specifications, on moderate terms; assistance rendered, town or country.—Box 5,036, Builders' Journal Office.

ARCHITECT'S Junior Assistant (20), 4½ years' experience, West End and country offices; working drawings, details, perspectives, competitions, general office routine; excellent draughtsman and tracer. Highest references; salary 25s.—G. W. S., 26, Cowley Road, Ilford, Essex. 5056

AS traveller, constructional steel, or founders; good connection architects, builders; good estimating and draughtsmanship; over 22 years' experience.—W. 61, Royal Hill, Greenwich. 5077

BUILDER'S Clerk, used to double entry, dissecting time sheets, etc.; good general experience; draughtsman; within 60 miles radius.—Henry, 4, Plimsoll Road, Finsbury Park, N. 5037

BUILDER'S Book-keeper, 9 years' excellent reference from present employer. All books, double entry, prime costs, accounts, trading and profit and loss accounts, etc.—Box 5049, Builders' Journal Office.

BUILDER'S, Manager, Estimator and Surveyor, seeks re-engagement; competent, reliable, energetic; quantities, estimates, supervision, measure, adjust accounts and variations; entire charge; thorough, practical experience all branches; excellent references.—H., 1, Elmslea Villas, South View, Farnham. 5105

BUILDER'S Assistant (22) desires Situation in town or country, good knowledge of plans, specifications, quantities, measuring, accounts, outside supervision, and setting out.—F. B., 30, Carminia Road, Upper Tooting, S.W. 5101

BUILDER'S Son (22) with 6 years' practical experience, desires situation with a firm of contractors to gain experience; abstainer, excellent references; certificated.—Box 5094, Builders' Journal Office.

BUILDER'S Clerk wants position with charge of office of provincial builder, accurate surveyor and estimator; extensive experience with accounts and architects' settlements; has revised present employer's routine and gets accurate costs promptly.—G. M. Malpas, 12, New Road, Reading.

BUILDER'S Clerk, age 23 (abstainer) wants situation, 5 years' experience, good tracer able to take charge of men, pay wages, etc., excellent references.—Box 5140, Builders' Journal Office.

CONTRACTOR'S or surveyor's assistant desires situation; experienced in measuring, levelling, setting out, accounts, supervision; good references, moderate salary for permanency. Could invest small sum.—Box 5074, Builders' Journal Office.

DRAUGHTSMAN (26) 10 years experience; good designer; architectural and constructional engineering; armoured concrete work; tracing, colouring, measuring up, details, assist quantities and specifications, also travelling; moderate salary.—Flat man, 215, Hampton Road, Ilford. 5133

ENGINEER, mechanic, desiring change, requires permanent situation on staff, official or private; thorough all-round general experience; married.—J. G., 86, Bathurst Gardens, Willesden, N.W. 5144

ESTATE Clerk of Works, or otherwise, desires engagement, over 20 years' practical experience, estates and public works, up-to-date knowledge of farm buildings, cottage, saw mill work, and machinery, water supply and drainage, preparing plans and estimates; exceptional testimonials.—Alfred T. Peck, "Lulworth," Hatherley Road, Winchester. 5090

FOREMAN, general or carpenter, conversant all branches, abstainer; time, cost, and stock books; moderate salary.—Box 5093, Builders' Journal Office.

GRAINING wanted, piecework; distance no object; best work only.—C. Monk, Oakdene, Parkfield Road, Willesden, N.W. 4951

GENERAL Foreman in the Midlands seeks an engagement; thoroughly competent manager, all trades, wide and varied experience, well up in all details.—Box 5086, Builders' Journal Office.

GENERAL Foreman or Clerk of Works.—Advertiser seeks engagement, extensive experience in charge of large jobs; highest reference as to character and capabilities; eight and a half years in last employ.—W. P., 45, Fernhurst Road, Fulham, S.W. 5115

QUANTITY Surveyor's Assistant desires permanent or temporary engagement; taking off, specifications, variations, etc.; varied London experience; excellent references; passed F.S.I. — Box 5100, Builders' Journal Office.

STOREKEEPER and yardman (age 29), seeks re-engagement in builder's yard. Well up in booking materials in and out works. Fifteen years' experience. First-class references. Distance no object.—M. Poole, 12, Jardin Street, Albany Road, Camberwell, S.E. 5117

TRAVELLER, well-known, and with excellent connection with architects and contractors in Liverpool and Lancashire and Cheshire, is desirous of representing first-class firm.—Box 5111, Builders' Journal Office.

Appointments Vacant.

ARCHITECT'S Pupil.—Vacancy in busy West End office; small premium, but must be fond of drawing.—Stanley-Barrett, M.S.A., Gray's Inn Chambers, 20, High Holborn, W.C. 5125

BUILDER wanted to purchase land and build cottage near Croydon district; will enter into agreement to purchase outright upon completion (four months); excellent opportunity to secure more work in growing district; 7 minutes from railway station. Write immediately, Box 5128, Builders' Journal, Office, Caxton House, Westminster, S.W.

BUILDER'S Clerk, used to double entry, prime cost, accounts, all books; S.W. England.—Box 5132, Builders' Journal Office.

WANTED immediately a first-class, active, all-round Architect's Assistant, with experience in public elementary schools; he must also be an expeditious draughtsman and quantity surveyor, capable of preparing a complete bill of quantities (London system); salary £2 10s. per week, payable monthly.—Apply, with full particulars, to County School Architect, 62, Charles Street, Cardiff. 5134

Miscellaneous.

ANTIQUE Oak Beams, 24ft. long, 12in. to 16in. square, fine figure; also tiles in old tithe barn at Plumstead, for Sale as it stands.—Arnold, Sidcup. 5142

FOR SALE, the grand old oak staircase and statuary marble chimney-piece, from Brent House, Brentford; fully illustrated (with drawings and particulars) in June issue of "Architectural Review."—Apply, Williams, Holly House, Brentford, W. 5122

FOR SALE, "Modern Buildings: Their Planning, Construction, and Equipment," Middleton, 6 vols., absolutely new; what offers?—Smith, 25, St. James's Parade, Bath. 5126

FOR SALE.—Principles of Planning, Marks, 5s.; Stresses and Thrusts, Middleton, 3s.; Structural Iron and Steel, Twelvetrees, 4s.; all new; or best offer.—The Firs, Coldred, near Dover. 5120

For **PHOTO PRINTS** on
Tracing Cloth,
Try B. J. HALL AND CO., LTD.,
39, Victoria Street, Westminster.

POLING Boards, selected lengths and thicknesses, best quality and full measure. Also scaffold boards, putlogs, scantlings, deals, battens, and boards. Lowest wharf prices.—C. H. Glover and Co., Ltd., Importers, Hatcham Saw Mills, Old Kent Road, S.E.

SECOND-HAND Optical Mart.
For the Purchase and Sale of
LEVELS, THEODOLITES, DRAWING INSTRS.
—Clarkson's, 338, High Holborn, London, W.C.
(Opposite Gray's Inn Road).

WANTED at once, large quantity second-hand scaffold boards, poles, 28 to 35 ft.; cords and putlogs, in good condition. Price and full particulars.—Box 5053, Builders' Journal Office.

WANTED, 6 copies of The Builders' Journal for December 21st, 1904. 6d. offered for each copy.—The Publisher, The Builders' Journal, Caxton House, Westminster, S.W. 5078

WANTED Clay's "School Buildings" and Rivington's "Building Construction III."—Box 5096, Builders' Journal Office.

UNIVERSITY OF ILLINOIS-URBANA
3 0112 076145041